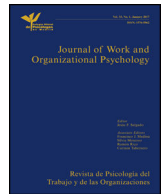




Journal of Work and Organizational Psychology

www.elsevier.es/rpto



Psychometric properties of the Portuguese version of the Global Transformational Leadership (GTL) scale

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ARTICLE INFO

Article history:

Received 3 February 2016

Accepted 10 February 2017

Available online xxx

Keywords:

Transformational leadership

Psychometric qualities

Exploratory factor analysis

Confirmatory factor analysis

ABSTRACT

The aim of this study is to adapt and consequently validate the *Global Transformational Leadership* measuring scale (GTL). The scale was therefore applied to a sample of 456 members of 70 work groups, belonging to 26 organizations. The factorial structure of the scale was analysed through the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), with the sample being split in two equal parts: EFA was conducted in both sub-samples and CFA was applied in the second sub-sample. The internal consistency was evaluated via Cronbach's alpha and the nomological validity was analysed via the evaluation of the GTL's correlations with both team-level autonomy and quality of group experience. The results revealed the presence of a unidimensional scale with a good level of internal consistency. Regarding the nomological validity, the results pointed to hypothetical relations, since the GTL showed positive correlations with the variables considered. Thus, the Portuguese version of the GTL is presented as a useful instrument for evaluating transformational leadership.

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Propiedades psicométricas de la versión portuguesa de la escala *Global Transformational Leadership* (GTL)

RESUMEN

El objetivo de este estudio fue adaptar y, consecuentemente, validar al portugués la escala *Global Transformational Leadership* (GTL). La escala se aplicó a una muestra de 456 miembros de 70 grupos de trabajo, pertenecientes a 26 organizaciones. La estructura factorial fue analizada mediante el análisis factorial exploratorio (AFE) y el análisis factorial confirmatorio (AFC), después de dividir la muestra en dos partes iguales: la AFE se aplicó en las dos muestras y la CFA en la segunda muestra. La consistencia interna se evaluó mediante el alfa de Cronbach y la validez nomológica se analizó mediante las correlaciones de GTL con la autonomía del grupo y la calidad de la experiencia del grupo. Los resultados revelaron la presencia de una escala unidimensional con un buen nivel de consistencia interna. Los datos sobre la validez nomológica confirmaron las relaciones previstas, habiendo presentado la GTL correlaciones positivas con las variables consideradas. La versión portuguesa de la GTL se presenta como una herramienta útil para evaluar el liderazgo transformacional.

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Palabras clave:

Liderazgo transformacional

Propiedades psicométricas

Análisis factorial exploratorio

Análisis factorial confirmatorio

'What makes an excellent leader?' is the first of many questions that have arisen over time, given the focus on leadership in all organizations and societies. There is no society with complete absence of leadership, and leadership itself is influenced by the organizations and the society that surround it (Bass, 1997). In the middle of the 20th century, leadership became a prominent research area

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<http://dx.doi.org/10.1016/j.rpto.2017.02.004>

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(Judge & Bono, 2000), and is one of the most studied subjects in the Social Sciences, with numerous papers, perspectives, analysis levels, and theoretical and methodological orientation lines associated with this concept.

In the middle of the 80s an approach emerged that ended up dominating the interest of a large part of researchers – transformational leadership – which brought about a renewed interest in the study of leadership and changed its underlying paradigm (Hunt, 1999). Until the mid-1980s, according to Bass (1985), existing theories about leadership focused primarily on the clarification of the goal and the role of the employee and also on the way the leader compensated or sanctioned his behaviour. The concept of transformational leadership was created by Burns (1978), simultaneously with that of transactional leadership. Later on, these concepts were the object of operationalization and refinement by Bass (1985) through the Multifactor Leadership Theory (Tejeda, Scandura, & Pillai, 2001), triggering the change from the ‘transactional’ paradigm to the ‘transformational-transactional’ one. According to this theory, leadership started to be conceived of not only as a question of contingency reinforcement of employees’ performance by the transactional leader, but also as a way of moving the employees beyond their personal interests towards the wellness of the group, organization, or society by the transformational leader.

The most cited comprehensive leadership theory, the Multifactor Leadership Theory (Judge & Piccolo, 2004), includes a number of the leader’s behaviours (Bass, 1985; Bass & Avolio, 1993; Yukl, 1994) and, extending Burn’s (1978) work, divides leadership into three second-order domains: transformational, transactional, and *laissez-faire*. Transformational leadership, on which this paper focuses, is characterized as an adaptable and flexible leadership style that encourages followers to do more than they originally expected, broadening and changing their interests and leading to conscientiousness and acceptance of the group’s purposes (Bass, 1985; Bass, Avolio, Jung, & Berson, 2003; Bass & Riggio, 2006). The emphasis falls on collective motivations, where the main characteristic of this leadership type lies – the mobilization towards directing the interests to a common goal (Bass, 1999). In this context, transformational leadership is a process of influence which is capable of moving social systems, with the objective of making the employees become agents of change for the organization’s movement and development (Burns, 1978).

Podsakoff, McKenzie, Moorman, and Fetter (1990), through a literature review about transformational leadership, concluded that the concept can be summarized in six fundamental behaviours: identifying and articulating a vision; providing an appropriate model; promoting the acceptance of group goals; developing high performance expectations; giving individual support; and providing intellectual stimulation to staff. Inspired by this model, Carless, Wearing, and Mann (2000) described transformational leaders as those who exhibit the following seven behaviours: they 1) communicate a vision (develop an image of the future of the organization and communicate it); 2) develop staff (diagnose the needs and capacities of each employee and express an individual interest in each one); 3) provide support for them to work towards their objectives through coordinated team work; 4) empower staff (give them authority to implement policies and supporting their decisions); 5) are innovative (use non-conventional strategies to achieve their goals); 6) lead by example (adopt congruent behaviours with the attitudes and values they support); and 7) are charismatic (inspire employees to transcend their personal interests and limitations, develop a conscience of the collective interests and guide them to achieve extraordinary goals).

A large part of contemporary research about leadership focuses on the effects of transformational leadership on a set of individual and group variables. Therefore, at the individual level, the

studies performed have supported a positive effect of this kind of leadership on the commitment, motivation, and performance of employees (e.g., Arnold, Turner, Barling, Kelloway, & Mckee, 2007; DeGroot, Kikker, & Cross, 2000; Dumdum, Low, & Avolio, 2002; Fuller, Patterson, Hester, & Stringer, 1996; Judge & Piccolo, 2004; Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Nielsen, Randall, Yarker, & Brenner, 2008; Wang, Oh, Courtright, & Colbert, 2011; Wolfram & Mohr, 2008). In a recent meta-analysis, Wang et al. (2011) showed that there is a stronger effect of this leadership type on employees’ attitudes and motivation than on their performance. At the group level, research suggests a positive association of transformational leadership with the quality of group experience (e.g., Braun, Peus, Weisweiler, & Frey, 2013; Jung & Sosik, 2002; Long, Yusof, Kowang, & Heng, 2014; Nielsen, Yarker, Randall, & Munir, 2009) and with group autonomy (e.g., Butler, Cantrell, & Flick, 1999; Wofford, Whittington, & Goodwin, 2001).

Different measures can be found in the literature that assess transformational leadership behaviours, such as the Multifactor Leadership Questionnaire (MLQ; Avolio, Bass, & Jung, 1995), the Conger-Kanungo scale (Conger & Kanungo, 1994), the Leadership Practices Inventory (LPI; Kouzes & Posner, 1990), and the Transformational Leadership Questionnaire (TLQ; Alban-Metcalfe & Alimo-Metcalfe, 2000). These scales have in common the fact that they are relatively long and therefore time-consuming to complete. In order to overcome this difficulty, Carless et al. (2000) proposed a short, practical, and equally valid instrument to measure transformational leadership – the Global Transformational Leadership scale (GTL) – which is based on the seven behaviours of transformational leadership defined by the authors and referred to above. The GTL is composed by seven items (one item for each behaviour) that evaluate the frequency of transformational leadership behaviours exhibited by the leader, based on a 5-point Likert scale (1 = rarely or never to 5 = very frequently or always). In the original study, the authors, based on a sample of 1,506 participants of an international bank organization, performed an Exploratory Factor Analysis (EFA) that led to the emergence of one single factor. The unidimensional structure was later confirmed by a Confirmatory Factor Analysis (CFA). The authors also evaluated the convergent validity, via the comparison of the GTL results with LPI and MLQ, and the discriminant validity, via the comparison of results of groups of managers in which different scores were expected. The results obtained support the scale’s convergent and discriminant validities. Finally, the internal consistence, estimated via Cronbach’s alpha ($\alpha = .93$), revealed the presence of a scale with a reliability level much higher than the cut-off point of .70 proposed by Nunnally (1978).

Objectives

Considering the psychometric qualities of the original GTL version, and the fact that it is a small scale, offering the advantage of quick completion, the aim of this study is to adapt the GTL to the Portuguese language and commence studies of its validation. Since previous studies revealed that the GTL is a powerful tool to measure transformational leadership (Carless et al., 2000), its adaptation to the Portuguese language will be important both for research and practice. In fact, more studies can be developed in the future, in the Portuguese context, analysing the effects of this leadership approach on the individual, group, and organizational levels. Plus, this adaptation will also provide companies with a tool that diagnoses the level of transformational leadership behaviours adopted by leaders and that is both easy to apply and to fill in.

In the following sections, the procedures used in the adaptation of the GTL, the analysis of its factorial structure (with EFA and CFA), and the reliability estimation, as well as the findings regarding its nomological validity, will be presented. Lastly, we discuss

implications and limitations of the results and offer some directions for future research.

Method

Sample

The inclusion of teams in the present sample respected [Cohen and Bailey's \(1997\)](#) definition: a team is made up of a minimum of three elements, with regular interaction in an interdependent way, aiming at a common target, and who perceive themselves and are perceived by others as a team.

This convenience sample is composed of 456 members of 70 workgroups. These teams had 9 members on average ($SD = 6.77$) and are from 26 organizations of several activity sectors (industry, services, commerce), located in the Centre and the centre-north of Portugal. The type of activities performed by the teams of the sample is heterogeneous, with industrial production and commerce being the most representative (42.1%), followed by R&D (33%). All the teams had a designated leader.

The sociodemographic characteristics of the sample are as follows. It is composed of 53.7% women, and the average age is 36 ($SD = 9.45$), ranging from 19 to 63 years old. The majority of participants have a university degree (50.5%), while 37.3% have 12 years of schooling. The average tenure in the organization is 10 years ($SD = 9.71$), and 5 years in the team ($SD = 5.71$). Team members' jobs range from high responsibility, autonomy, and amplitude jobs (54.5%) to more specialised and supervised jobs (44%). Finally, the face-to-face interaction of each worker with the other elements of the team is about 5 hours/day ($SD = 2.65$).

Data Collection Procedures

Data was collected by means of two strategies. In the majority of the organizations, the questionnaires were administered by a person with authority at the organization and a strategic relationship with the employees, and who had been previously instructed by a research team member. However, when this strategy was not possible to implement, the questionnaire was filled in online via an electronic platform, with the link being provided to the participants. In both cases, the anonymity and the confidentiality of the answers were guaranteed.

Measures

The development of the Portuguese version of the GTL followed the procedures recommended by [Hambleton \(2005\)](#). Firstly, language experts, proficient in both English and Portuguese, translated the measure into Portuguese. Secondly, this version was analysed, for instance in terms of its readability and adaptation to the Portuguese culture, by a panel of experts (composed by researchers and master's students who were specialists in the field of organizational psychology and also proficient in English). The feedback from the panel led to the reformulation of some items in order to improve their fit to the Portuguese context. Thirdly, a native English speaker with a complete understanding of Portuguese proceeded with a back-translation of the scale. Finally, the original version and this version were compared in terms of their equivalence of meaning.

The Portuguese version of the GTL was next applied to a workgroup of a micro firm belonging to the tourism sector, in order to assess the clarity and the ease of understanding of the items. No problems arose with the comprehension of the items in this pilot study, so no changes were introduced in the submitted version.

Two more scales were administered with the aim of assessing the nomological validity of the GTL. These were the Quality

of Group Experience scale ([Aubé & Rousseau, 2005](#)) and the Team-Level Autonomy scale (TLA; [Langfred, 2005](#)). Both were adapted to Portuguese following the same procedures as those of the GTL adaptation described above.

The Quality of Group Experience scale is a three-item measure that assesses the intragroup climate on a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*). In the original study, with a sample of 392 members of 74 teams belonging to 13 Canadian organizations, this scale showed an excellent reliability ($\alpha = .96$) ([Aubé & Rousseau, 2005](#)). The TLA is an eight-item Likert scale (ranging from 1 = *almost doesn't apply* to 5 = *almost totally applies*) that aims to evaluate teams' structural and strategic autonomy. In the original study, with a sample of 461 members of 89 teams from two North American industrial organizations, this scale presented a unidimensional structure with excellent reliability ($\alpha = .91$) ([Langfred, 2005](#)).

Results

Statistical Procedure

Firstly, missing values were analysed and no survey contained a number of non-responses equal to or greater than 10% ([Bryman & Cramer, 2004](#)). The total sample was randomly divided into two sub-samples (each one with 228 participants) in order to obtain evidence of cross-validity. In the first sub-sample, composed of 48 teams, EFA was performed by applying the principal component analysis. In the second sub-sample, consisting of 22 teams, two procedures were adopted in order to validate the factorial structure obtained from the first sub-sample: a new EFA was conducted and Tucker's (1951) congruence coefficient, first developed by [Burt \(1948\)](#) and popularized by Tucker, was estimated, and a CFA was performed. Reliability, measured via Cronbach's alpha, was computed for each of the sub-samples and also for the total sample.

Psychometric Analysis of the GTL

Items descriptive analysis. The descriptive statistics of the items were computed for the first and second sub-samples and for the total sample ($N = 456$) (mean, standard deviation, minimum and maximum, frequencies for response option, and skewness and kurtosis), as can be seen in [Table 1](#). It was observed that the subjects' answers were distributed over the five response options in each of the scale items and that the percentage of responses in one option was less than 40% in all items. Results concerning the univariate normality revealed no severe normality violations, since absolute skewness (Sk) and kurtosis (K) values were lower than 3.0 and 8.0, respectively ([Kline, 2005](#)) (in absolute values, the highest value for skewness was 0.84 on item 7 from the first sub-sample, and for kurtosis it was 0.73 on item 2 also from the first sub-sample). These data indicate an adequate overall variability of the answers given by the subjects and an adequate discriminative power of the items.

First sub-sample analysis. EFA was performed with the SPSS program (IBM SPSS Statistics 22). The viability of EFA was assessed by means of the following three indicators: Kaiser-Meyer-Olkin's Measure of Sampling Adequacy (KMO); Bartlett's test of sphericity; and the Anti-image Matrix. Results from KMO (.93); Bartlett's test, $\chi^2(21) = 1118.957$, $p < .001$; and Anti-image Matrix (the values on the main diagonal vary between .92 and .95 and all values outside this diagonal were small) confirmed the adequacy of the matrix for factor analysis.

The seven items of the GTL were then submitted to a principal component analysis, with a free extraction of factors, which conduced to a one-factor solution responsible for 70.23% of the variance and with an eigenvalue of 5.76. As can be seen in [Table 2](#), all items

Table 1
GTL: Items Descriptive Analysis.

Item n°	First sub-sample				Second sub-sample				Total Sample			
	Mean	SD	Sk	K	Mean	SD	Sk	K	Mean	SD	Sk	K
My team leader...												
1. communicates a clear and positive vision of the future.	3.90	0.84	-0.44	0.14	3.41	1.04	-0.49	-0.03	3.66	0.94	-0.46	0.05
2. treats staff as individuals, supports and encourages their development.	4.00	0.87	-0.78	0.73	3.49	1.05	-0.55	-0.03	3.75	0.96	-0.67	0.35
3. gives encouragement and recognition to staff.	3.89	0.94	-0.60	-0.06	3.42	1.08	-0.38	-0.32	3.66	1.01	-0.49	-0.19
4. fosters trust, involvement and cooperation among team members.	3.98	0.91	-0.63	-0.02	3.52	1.12	-0.51	-0.34	3.75	1.02	-0.57	-0.18
5. encourages thinking about problems in new ways and questions assumptions.	3.91	0.93	-0.63	0.09	3.55	0.99	-0.42	-0.14	3.73	0.96	-0.53	-0.03
6. is clear about his/her values and practices which he/she preaches.	4.07	0.87	-0.62	-0.16	3.46	1.10	-0.49	-0.33	3.77	0.99	-0.55	-0.25
7. instils pride and respect in others and inspires me by being highly competent.	3.99	0.95	-0.84	0.44	3.44	1.12	-0.51	-0.29	3.72	1.04	-0.67	0.07

Table 2
GTL: Factor Loadings and Communalities (h^2).

Item n°	Factor Loading	h^2
My team leader...		
1. communicates a clear and positive vision of the future.	.783	.613
2. treats staff as individuals, supports and encourages their development.	.832	.693
3. gives encouragement and recognition to staff.	.867	.752
4. fosters trust, involvement and cooperation among team members.	.849	.720
5. encourages thinking about problems in new ways and questions assumptions.	.832	.692
6. is clear about his/her values and practices which he/she preaches.	.827	.685
7. instils pride and respect in others and inspires me by being highly competent.	.872	.761

presented loadings above .78 and communalities equal to or above .61. As regards internal consistency, the Cronbach's alpha obtained was .93.

Second sub-sample analysis. In order to quantify the degree of similarity between the factor solutions from each one of the samples, a new EFA was performed in the second sub-sample and Tucker's congruence coefficient (Tucker, 1951) was estimated. The solution obtained from the second sub-sample revealed a high degree of congruence with the solution obtained from the first sub-sample (Tucker's congruence coefficient = .999).

The one-dimensional structure obtained from EFA was then tested with CFA, using the maximum likelihood estimation method, with AMOS software (IBM SPSS AMOS 22.0). According to Byrne (2010) and Kline (2005), the evaluation of the model fit should derive from a variety of perspectives and be based on the adequacy of the model as a whole and on the parameter estimates.

In the evaluation of the model as a whole, the principal goodness-of-fit statistics presented in the literature were considered (e.g., Byrne, 2010; Kline, 2005): a) χ^2 statistic; b) χ^2/df , in which values between 2 and 3 are recommended, with values up to 5 being admissible; c) the Comparative Fit Index (CFI), which ranges from zero to 1.00, with a value $>.95$ being considered representative of a well-fitting model; the Root Mean Square Error of Approximation (RMSEA), with values less than .05 being indicators of good fit, and values as high as .10 being considerable acceptable. The results obtained from CFA indicated that the model's goodness-of-fit was acceptable. Thus, although the χ^2 statistic was significant, $\chi^2(14, N = 228) = 43.888, p < .001$, the χ^2/df (3.14) was below the reference value, and CFI presented a very good value (CFI = .98). Additionally, RMSEA, with a value of .097 and a statistically significant associated confidence interval between .065 and .130, indicated an acceptable fit of the model to the population (though very close to the threshold proposed in the literature). Since, overall, the fit indexes presented acceptable values, we decided to not re-specify the model.

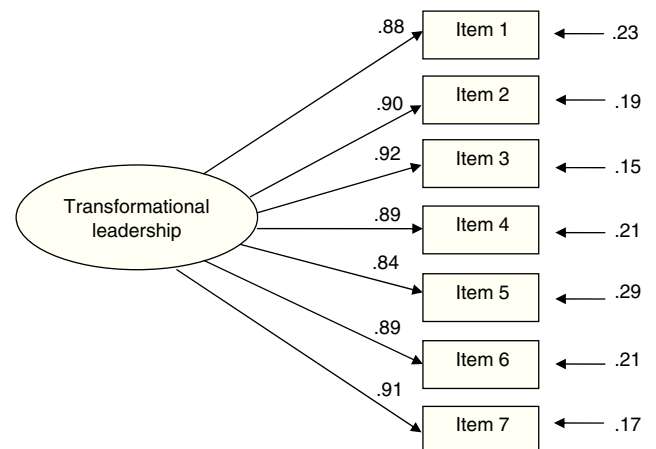


Figure 1. GTL Factor Structure (standardized solution wherein values concerning error errors are proportions of variance not explained).

Concerning the evaluation of the adequacy of the parameter estimates (feasibility and statistical significance of the parameter estimates and appropriateness of the standard errors), results were very favourable. Figure 1 shows the retained factor structure, in which all the estimated parameters are statistically significant and the loadings of the items are much higher than .50.

The evaluation of the internal consistency in the second sub-sample, as in the first sub-sample, presented adequate values ($\alpha = .96$).

Nomological Validity

Nomological validity was evaluated, considering the total sample, via the analysis of GTL correlations with quality of group experience and group autonomy. Since, in the present study, the unit of analysis was the group rather than the individual and data

Table 3
Descriptive Statistics, Internal Consistency and Intercorrelations between Transformational Leadership, Group Autonomy, and Quality of Group Experience.

	M	SD	α	1	2	3
1. Transformational Leadership	3.88	0.59	.94	–		
2. Group Autonomy	3.46	0.56	.89	.55**	–	
3. Quality of Group Experience	3.95	0.53	.87	.53**	.41**	–

** $p < .01$

were obtained from self-administered surveys answered by individuals, it was necessary to aggregate individual responses to the team level. To justify aggregation, we computed the average deviation index (AD_M Index) developed by [Burke, Finkelstein, and Dusig \(1999\)](#). Following the authors' recommendations, and since all the scales have 5 response options, we used the criterion AD_M ≤ 0.83 to aggregate, with confidence, individual responses to the team level. The average AD_M values obtained for transformational leadership, quality of group experience, and group autonomy were, respectively, .59, .57, and .66. These values were below the upper-limit criterion of .83, revealing that the level of within-team agreement was sufficient to aggregate team members' scores.

Table 3 presents the intercorrelations between the variables studied, as well as descriptive statistics and reliability. As expected, the GTL presented high positive correlations ([Cohen, 1988](#)) with group autonomy ($r = .55, p < .001$) as well as with quality of group experience ($r = .53, p < .001$), and these results support the nomological validity of the scale. All the scales presented adequate values of internal consistency.

Discussion, Implications, and Future Directions

According to the transformational leadership model ([Carless et al., 2000](#)) that supports the GTL, and based on the results obtained in the analysis of the original version of the instrument, the emergence of one factor was expected, corresponding to the construct under study – transformational leadership. EFA and CFA supported the one-dimensional structure of this scale. All items have high factor loadings and the GTL has a good level of internal consistency. These results are convergent with those of the original scale. The alpha coefficients, the factor loadings (EFA and CFA), and the variance explained are, indeed, very similar to the values of the original scale.

In addition to the study of the factorial structure, we also aimed to contribute to the analysis of the nomological validity of the scale through the study of GTL correlations with group autonomy and quality of group experience. As expected, the GTL showed a significant and highly positive correlation with these variables.

In short, the results of the adaptation of GTL are positive and encouraging since the scale showed adequate psychometric properties, namely good levels of validity and reliability. The Portuguese version, similarly to the original, constitutes a valid and reliable instrument to assess transformational leadership levels and can be used in future research seeking to measure this construct. As it is a short scale, its use in research and also in the intervention context is, then, made easier. Indeed, the GTL also can be seen as a useful tool for organizations and can be applied to a wide range of contexts and for different purposes: as a performance appraisal tool; as a diagnostic tool, for example, to identify the development needs of a leader; for the use of leaders themselves to obtain feedback from their employees about their leadership behaviour ([Bernardin, Dahmus, & Redmon, 1993](#)); and as a selection and/or promotion tool, based on the assumption that leadership skills should be measured in the selection and promotion of managers (the original study showed that the GTL allows to discriminate between low performance managers and high-performance managers).

In spite of the relevance and interest of the results we found, it should also be noted that this study also has some limitations. In particular, the convenience method used for sampling, despite being practical, fast, and cost-effective, does not allow us to apply with confidence the results and conclusions to the population, but only to the sample under study, since there is no way of ensuring that the sample is reasonably representative of the population ([Bryman, 2003](#)). However, considering this limitation, we tried to collect a sample as heterogeneous as possible.

In order to provide additional evidence of the psychometric properties of this instrument, we suggest conducting further studies using a broader sample and also analysing other types of validity (e.g., convergent validity, discriminant validity, content validity, criterion-oriented validity). As done by [Carless et al. \(2000\)](#) in their original study of the GTL, the analysis of the correlation between the GTL and other transformational leadership reference measures, in particular the Multifactor Leadership Questionnaire (MLQ; [Avolio et al., 1995](#)) and the Leadership Practices Inventory (LPI; [Kouzes & Posner, 1990](#)) is required. It would also be timely to analyse the functioning of the scale and the discriminant validity in different groups of employees, for instance, between men and women, between people executing routine and non-routine tasks, younger versus older people. Furthermore, the study of the GTL correlations with other variables of interest will be also important, in particular team viability and team performance: two of the effectiveness measures with which transformational leadership showed significant relationships in previous studies ([Stewart, 2006](#)).

Conflict of Interest

The authors of this article declare no conflict of interest.

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