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Article

Translation and Validation of a Team Viability Scale for Peruvian Workers

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Abstract: *Background*: Team viability, understood as the ability to adapt and collaborate effectively over time, is a key concept in organizational literature. In Peru, where changes are constant, culturally adapted tools are needed for its measurement. *Objective*: To translate and validate a team viability scale for Peruvian workers. *Methods*: An instrumental design was used with 290 public sector employees (M = 34.61; SD = 9.2). The translation followed a cultural adaptation process, and validity was assessed through descriptive, correlational, and confirmatory factor analysis. *Results*: Confirmatory factor analysis supported a unidimensional structure with excellent fit indices (CFI and TLI > 0.99, RMSEA and SRMR < 0.01). The scale showed high invariance across gender and good internal consistency ($\alpha = 0.90$). *Conclusions*: The validated scale is a reliable tool for measuring team viability in Peru. Its implementation can enhance human resource management and improve collaboration in the public sector.

Keywords: team viability; cultural adaptation; human resources management; factor analysis; measurement invariance

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1. Introduction

Team viability is a fundamental concept in organizational literature, referring to a team's ability to effectively adapt to internal and external changes, ensuring sustainable collaboration over time. This aspect is crucial in dynamic work environments, where teams constantly face challenges, such as integrating new members, adopting emerging technologies, and managing evolving operational settings (Lhaden et al., in press; Sundstrom et al., 2000). Viability not only encompasses group effectiveness in terms of performance and satisfaction but also emphasizes adaptability and cooperative capacity. Factors such as cohesion, role clarity, and effective communication are key to maintaining this adaptability, while commitment to shared goals fosters resilience and encourages proactive strategies to address changes (Aubé & Rousseau, 2011; Kirkman & Rosen, 1999; Locke et al., 1981; Tosi et al., 1991). Affective commitment, understood as the emotional bond between team members, is a crucial determinant of viability as it strengthens trust, cohesion, and a shared sense of purpose. Similarly, psychological safety, defined as the perception of an environment where members can take risks and express ideas without fear of retaliation,

promotes innovation and optimal team performance (Edmondson, 1999; Kozlowski & Bell, 2003). In contrast, factors such as interpersonal aggression can undermine team viability by eroding trust and reducing collective commitment. The literature has highlighted that trust mediates the relationship between affective commitment and viability, underscoring the importance of positive organizational environments in preserving team functionality (Aubé & Rousseau, 2011; Rousseau & Aubé, 2010).

In the contemporary organizational context, globalization and technological advancements have introduced new challenges and opportunities for team viability. Team diversity can enrich innovation and improve problem-solving, while effective virtual team management has become essential for maintaining coordination and cohesion at a distance (Harrison & Klein, 2007; Martins et al., 2004). Furthermore, alignment between individual and group goals is a critical factor in ensuring the sustainability of collective performance (Mathieu et al., 2008). Effective leadership, clear communication, and an environment that fosters trust and mutual respect are key elements in enhancing adaptability and ensuring long-term team success (Gully et al., 2002; Zaccaro et al., 2001).

Teamwork in the public sector is essential for improving efficiency, innovation, and service quality. Various studies have emphasized the importance of collaboration across management levels and departments to achieve organizational goals, showing that diversity in management teams enhances strategic adaptability and overall performance (Gachugu Ehud et al., 2019). However, implementing teams in the public sector faces challenges such as bureaucracy and resistance to change. In this context, trust and affective commitment have been identified as key factors for team viability, even in virtual environments where cognitive trust mediates sustainability (Lhaden et al., in press; Knight et al., 2018). Team viability is particularly relevant in the Peruvian organizational context, given that factors such as the absence of effective leadership, resource limitations in rural areas, and work-related stress in urban settings can affect team dynamics (Jiménez Aliaga et al., 2023; Norena-Chavez & Romani Torres, 2024). Studies in Peruvian municipalities have demonstrated that an environment based on trust, effective communication, and a sense of belonging strengthens team cohesion and effectiveness (Norena-Chavez & Romani Torres, 2024; Torrelles et al., 2011). Additionally, the integration of multidisciplinary teams and strategies for effective cooperation and communication have proven to be fundamental in optimizing public service quality and improving job satisfaction (SERVIR, 2021).

The Team Viability Scale was developed by Aubé and Rousseau (2005) in Canada and has proven to be a valid tool for assessing teams' ability to maintain cohesion and collaboration in various organizational settings. It has been applied in contexts such as public safety and educational teams, exploring its utility in measuring group dynamics and long-term sustainability (Aubé & Rousseau, 2005, 2011). Its applicability in highly complex environments, where commitment to team goals can mediate the effects of interpersonal aggressive behaviors, has been extensively studied (Aubé & Rousseau, 2011). Despite its validation in various international contexts, the Team Viability Scale has not yet been adapted or validated in the Latin American context, specifically in Peru. The Peruvian organizational structure, characterized by multidisciplinary teams in both the public and private sectors, presents unique challenges related to group cohesion and long-term sustainability. Validating this scale in the Peruvian context would not only adapt a measurement tool to local cultural and organizational characteristics but also explore how specific sociocultural factors influence team viability. Therefore, the objective of this research was to translate, adapt, and validate the Team Viability Scale among Peruvian workers.

2. Materials and Methods

2.1. Design and Participants

The research employed a non-experimental, cross-sectional design focused on instrumental analysis, specifically aimed at validating and evaluating the psychometric properties of the instrument under study (Ato et al., 2013). The sample was obtained through non-probabilistic convenience sampling, selecting only Peruvian public servants who were active members of institutional work teams. This criterion was established to ensure the participants' relevance to the construct under examination, as the scale assesses aspects of collaboration and adaptability within work teams. The sample size was determined using an electronic calculator (Soper, 2024) that accounted for the number of observed and latent variables in the model, an anticipated effect size of 0.2, a statistical significance level of 0.05, and a statistical power of 0.80. This calculation resulted in a recommended minimum sample size of 87 participants. However, the study included 290 Peruvian public servants, ranging in age from 20 to 63 years (M = 34.61; SD = 9.2). Regarding gender distribution, 41.4% of participants were women, and 58.6% were men. Most participants were single (74.1%), and the most common educational attainment was a master's degree (21.7%), as shown in Table 1.

Table 1. Sociodemographic Characteristics.

Characteristic		n	%
Gender	Female	120	41.4
	Male	170	58.6
Marital Status	Married	72	24.8
	Single	215	74.1
	Widowed	3	1.0
Education Level	Doctorate	3	1.0
	Master's Degree	63	21.7
	Technical Qualification	47	16.2
	University Degree	177	61.0

2.2. Instrument

***Team Viability*:** We utilized the English version of the Team Viability Scale, consisting of four items designed to assess a team's ability to adapt to changes, solve problems, integrate new members, and sustain collaboration over time. The specific items are detailed in the Table 2. The Cronbach's alpha coefficient for the Team Viability Scale was 0.84, indicating good internal consistency. Each item was rated on a 5-point scale ranging from "not at all true" (1) to "completely true" (5) (Aubé & Rousseau, 2005).

The Spanish adaptation of this scale followed a cultural adaptation process based on established methodologies (Beaton et al., 2000):

1. Two native Spanish bilingual translators independently translated the scale from English to Spanish.
2. Subsequently, two bilingual experts unfamiliar with the original instrument performed a back-translation into English.
3. Next, two administrators and two psychologists reviewed both the translated Spanish versions and the back-translations to create a preliminary Spanish version of the scale.
4. This preliminary version was then tested with a group of 15 workers to evaluate its clarity and appropriateness within the Spanish cultural and linguistic context, as shown in Table 2.

Table 2. Descriptive Statistics and Reliability.

English	Spanish	M	SD	g1	g2	r.cor
1. Team members adjust to the changes that happen in their work environment.	1. Los miembros del equipo se adaptan a los cambios que ocurren en su entorno laboral.	4.14	0.7	−1.05	2.84	0.76
2. When a problem occurs, the members of this team manage to solve it.	2. Cuando surge un problema, los miembros de este equipo logran resolverlo.	4.25	0.72	−0.97	1.99	0.82
3. The new members are easily integrated into this team.	3. Los nuevos miembros se integran fácilmente en este equipo.	4.14	0.71	−0.61	0.46	0.75
4. The members of this team could work a long time together.	4. Los miembros de este equipo podrían trabajar juntos durante mucho tiempo.	4.18	0.78	−0.98	1.46	0.74

Note. M = mean, SD = standard deviation, g1 = skewness, g2 = kurtosis.

2.3. Procedure

Data collection was conducted in municipal offices within the province of Rioja, Peru, from January to March 2024. These institutions were selected based on their accessibility and the documented implementation of team-based work structures. Data were gathered through a self-administered questionnaire distributed in person at the participating municipalities. All selected participants were members of formal work teams that had been established by their institutions for at least one year. However, detailed data on the size, specific composition, or type of teams were not collected, which represents a limitation of this study. Participants were assured that they could withdraw from the study at any time if they chose to do so. Throughout the data collection process, the ethical standards outlined in the Declaration of Helsinki were strictly followed, including the protection of participants' privacy and confidentiality of personal information, as well as the minimization of potential impacts on their physical, mental, and social well-being.

2.4. Data Analysis

The analysis began with a descriptive evaluation of the items on the Team Viability Scale, assessing metrics such as the mean, standard deviation, skewness (g1), and kurtosis (g2). Skewness and kurtosis values were deemed acceptable if they fell within the range of ± 1.5 (Pérez et al., 2015). Additionally, an item-total corrected correlation analysis was conducted to identify and exclude items with a corrected item-total correlation [≤ 0.2 r(i-tc) ≤ 0.2] (Kline, 2016).

Subsequently, a confirmatory factor analysis (CFA) was conducted to validate the unifactorial structure of the scale, using the MLR estimation method recommended for data that did not fit a normal distribution (Muthen & Muthen, 2017). Model fit criteria included chi-square (χ^2), the Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI), with ideal values ≥ 0.95. The Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR) were also assessed, with acceptable values ≤ 0.08 (Kline, 2016; Schumacker & Lomax, 2016). Scale reliability was estimated using Cronbach's alpha and McDonald's omega, with values above 0.70 considered adequate (McDonald, 1999).

All statistical analyses were performed using RStudio (Version: 2024.12.1+563) (Allaire, 2018), with R version 4.1.1 (R Foundation for Statistical Computing, Vienna, Austria; http://www.R-project.org accessed on 13 February 2025). The "lavaan" package (version 0.6-19) (Rosseel, 2012) was used for confirmatory factor analysis and structural equation

modeling, while the "semTools" package (Jorgensen et al., 2022) facilitated the measurement invariance analysis.

3. Results

3.1. Descriptive Statistics

In the descriptive statistics of the Team Viability Scale items, Item 2 ("When a problem arises, the members of this team manage to resolve it") has the highest mean value at 4.25, indicating that participants tend to respond more positively to this specific item. On the other hand, Item 1 ("Team members adapt to changes occurring in their work environment") and 3 ("New members integrate easily into this team") share the lowest mean value at 4.14, suggesting that these items receive slightly less favorable evaluations. Regarding kurtosis (g2), values range from 0.46 to 2.84, showing variability in the peakedness of response distributions, with some items displaying kurtosis outside the ideal range of −1.5 to 1.5. The item-total correlations (r.cor) are high, ranging from 0.74 to 0.82, all well above the acceptable threshold of 0.30, demonstrating a strong relationship of each item with the overall construct measured by the scale (Table 2).

3.2. Confirmatory Factor Analysis and Reliability

A confirmatory factor analysis (CFA) was conducted under the hypothesis of a unidimensional model (Aubé & Rousseau, 2005). This initial model showed an acceptable fit according to the fit indices: $\chi^2 = 0.080$, df = 1, $p = 0.780$, CFI = 1.00, TLI = 1.01, RMSEA = 0.00 (90% CI 0.00–0.00), SRMR = 0.00. All item factor loadings (λ) exceeded the value of 0.50, indicating a strong association with the proposed dimension. Additionally, reliability, measured by Omega and Cronbach's alpha indices, was 0.87 and 0.90, respectively, reflecting adequate internal consistency (Figure 1).

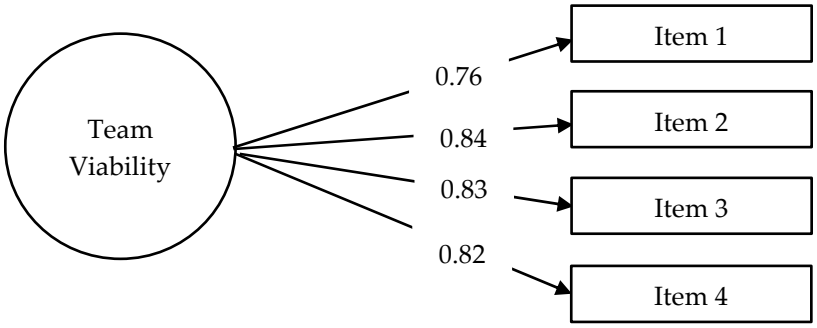

Figure 1. Factor Model.

3.3. Factorial Invariance

Results from the invariance analysis of the team viability scale among Peruvian workers indicate a high degree of consistency in measuring attitudes toward transformational leadership, regardless of participant gender (Table 3). The process began by assessing configurational invariance, which serves as the baseline model, and showed a CFI index of 1, suggesting a perfect fit. This model establishes that the factor structure is comparable between groups. Next, metric invariance was examined, where factor loadings are held equal across groups. The slight change in CFI (ΔCFI = 0.002) indicates that the way items relate to the latent factor is similar between men and women, meeting Chen's criterion of a ΔCFI below 0.010. This implies that the scale measures transformational leadership on the same metric scale across genders. Scalar invariance, which includes equality of intercepts in addition to factor loadings, showed a ΔCFI of 0.007, still within the acceptable range, confirming that item scores are calibrated equivalently across genders, allowing for

meaningful comparisons of latent means between groups. Finally, strict invariance added equality in residuals. The change in CFI (ΔCFI = 0.003) remained below 0.010, validating that, not only factor loadings and intercepts, but also the variances and covariances of the observation errors are equivalent between men and women.

Table 3. Invariance by Gender.

	χ^2	df	*p*	TLI	RMSEA	SRMR	CFI	ΔCF
Configural	2.186	2	0.335	0.997	0.025	0.008	1	
Metric	5.903	5	0.316	0.995	0.035	0.037	0.998	0.002
Scalar	11.766	8	0.162	0.987	0.057	0.044	0.991	0.007
Strict	30.199	12	0.003	0.958	0.7	0.058	0.988	0.003

4. Discussion

Team viability is a critical concept in organizational literature, referring to a team's ability to effectively adapt to internal and external changes while maintaining sustainable and productive collaboration. Influenced by factors such as cohesion, role clarity, effective communication, and affective commitment, team viability is essential for addressing the challenges of dynamic environments, including diversity, technology, and globalization. The Team Viability Scale, developed by Aubé and Rousseau (2005), has proven useful in various organizational contexts but has not yet been validated in Latin America. In the Peruvian context, characterized by specific socio-cultural and structural challenges, this research aims to adapt and validate the scale to provide an appropriate tool for assessing and enhancing the sustainability and cohesion of teams in local organizations.

The use of Confirmatory Factor Analysis (CFA) to validate the unidimensional structure of a set of items, as in the current study, aligns with the methodology proposed by Aubé and Rousseau (2005). They emphasized its applicability in evaluating team viability and related constructs. This approach has been widely employed in previous studies to confirm the dimensionality of scales across various fields of psychology and social sciences (Mathieu et al., 2008; Paolucci et al., 2018). For instance, research has shown that team viability is positively associated with transformational leadership and team affective commitment, underscoring its importance in diverse organizational settings (Paolucci et al., 2018). Consistent with these findings, the present study reports fit indices superior to those typically observed in the literature. Values of CFI and TLI close to 1 and RMSEA and SRMR near 0 indicate excellent model fit (Hu & Bentler, 1999). Furthermore, the high reliability observed in Omega coefficients (0.87) and Cronbach's alpha (0.90) aligns with results from similar studies using this scale in different cultural and organizational contexts (Rousseau & Aubé, 2010). These results strengthen the construct validity of the scale, suggesting that the item responses satisfactorily reflect a single underlying dimension. Factor loadings exceeding 0.50 across all items reaffirm this association, providing robust evidence that the scale is internally coherent and consistent in measuring the construct. This validation ensures that the Team Viability Scale is a reliable tool for assessing team dynamics and adaptability in the Peruvian organizational landscape.

The results obtained in this study on factorial invariance show a Comparative Fit Index (CFI) that decreases from the configural to the strict model, consistent with expectations in measurement invariance literature. In invariance studies, it is common to observe a decline in CFI when moving from less restrictive to more restrictive models (Cheung & Rensvold, 2002). For instance, our study showed a CFI of 1 for the configural model, indicating perfect fit, while the metric, scalar, and strict models displayed slight yet progressive decreases (CFIs of 0.998, 0.991, and 0.988, respectively), reflecting the increased parameter restrictions between groups. These findings are similar to those reported by Brown (Brown, 2015), who

found that adding additional constraints often results in a decrease in model fit. A notable aspect of this research is the minimal magnitude of change in CFI (ΔCFI) when introducing different levels of restriction, suggesting that the measures used exhibit good factorial invariance across various levels. This contrasts with some studies where more pronounced variations may indicate issues with invariance between groups (Vandenberg & Lance, 2016). Examining changes in CFI values and incremental changes (ΔCFI) across the different invariance models (configural, metric, scalar, and strict) shows that the model retains high consistency under increasing restrictions. This indicates a high level of measurement equivalence across different groups, which is essential for research aiming to generalize findings across diverse populations. The metric model (CFI = 0.998) with a ΔCFI of 0.002 suggests that the measurement scale equivalence is almost perfectly maintained. The scalar model shows a slightly larger change (ΔCFI of 0.007), indicating that item intercepts may vary between groups, though not substantially. Finally, the strict model (ΔCFI of 0.003) suggests that error variances are also comparable between groups, pointing to strong factorial invariance.

4.1. Implications

The findings from the translation, adaptation, and validation of the Team Viability Scale in Peruvian workers have significant implications for professional practice, particularly in the public and private sectors in Peru. The validated scale provides organizations with a reliable tool to evaluate and monitor their teams' capacity to adapt to changes, solve problems, and maintain cohesion over time. The scale can be integrated into regular team performance evaluations, enabling the identification of critical areas for development. For instance, teams with low viability scores could benefit from group coaching programs or activities aimed at strengthening mutual trust and conflict resolution skills. At the policy level, these results support the need to develop public policies that enhance teamwork in the public sector. The scale can serve as a tool to evaluate and improve team viability within regional and municipal governments, facilitating the more effective implementation of decentralized policies that require intergovernmental coordination. From a theoretical perspective, the findings extend the applicability of the team viability theory to diverse cultural and organizational contexts. Validating the scale in Peruvian workers demonstrates that this construct, originally developed in Western contexts, is applicable in culturally diverse settings. This suggests that the theoretical principles of team viability are universal but must be adapted to account for local sociocultural factors. In summary, the validated Team Viability Scale offers practical utility for organizations, informs policy development, and contributes to the theoretical understanding of team viability in diverse contexts.

4.2. Limitations

One of the primary limitations of this study is its cross-sectional design, which prevents the inference of causal relationships between the studied variables. This design captures only a snapshot in time, limiting the understanding of how perceptions of team viability may change over time or under varying conditions. Future longitudinal studies could address these limitations by providing deeper insights into temporal and situational dynamics. The exclusive use of self-reports represents another significant limitation, as it may introduce biases such as social desirability or confirmation bias, potentially affecting the authenticity of participant responses. Additionally, the study did not evaluate common method bias (CMB), which can inflate or distort the relationships between variables when a single data collection method, such as self-reported questionnaires, is used. Although the psychometric indices suggest the scale's validity and reliability, future research could apply tests like Harman's Single-Factor Test or structural equation modeling to assess and

control for CMB. To mitigate such biases, the triangulation of methods or data sources is recommended in future studies. Another limitation is the lack of information on team size and composition, including factors such as gender, education, or workplace hierarchy. These variables could provide valuable insights into team dynamics and their relationship to viability. Exploring these aspects in future research would enhance the understanding of team viability. Finally, while the scale was adapted and validated for the Peruvian context, certain cultural nuances may not have been fully captured. Future studies could further refine this adaptation by involving a more diverse group of experts and participants to ensure the scale's cultural relevance and sensitivity. This would strengthen its applicability and reliability across various organizational and cultural settings.

5. Conclusions

The adaptation and validation of the Team Viability Scale in Peruvian workers not only confirm its reliability and validity in this context but also contribute to the advancement of human resource management by providing a culturally adapted tool to measure critical constructs such as team collaboration and adaptability. This study aligns with prior research utilizing the original scale in organizational contexts in Canada, Europe, and other Western countries, where team viability has been shown to correlate with group cohesion, affective commitment, and problem-solving capacity (Aubé & Rousseau, 2005; Paolucci et al., 2018). The results obtained, including reliability indices such as a Cronbach's alpha of 0.84 and a strong model fit in the confirmatory factor analysis (CFI = 1.00), are comparable to those reported in these studies, reinforcing the robustness and consistency of the scale. However, this work extends the applicability of the scale by exploring its use in a Latin American context, specifically within Peruvian public institutions. These institutions are characterized by unique challenges, such as limited resource availability and the need to foster cohesion within multidisciplinary teams. The validated scale provides organizations with a reliable method to measure key aspects of team viability, such as the ability to adapt to changes, integrate new members, and sustain long-term collaboration. These findings are particularly valuable for designing intervention programs aimed at strengthening team cohesion, enhancing effective communication, and promoting transformational leadership within work teams.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data can be requested from the corresponding authors.

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