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The Development of the Team Resilience Index

Introduction

Team resilience (i.e. the collective ability of a group of working adults to recover, adapt, and thrive in the face of challenges and setbacks while remaining healthily bonded), is a crucial construct in various organizational and collaborative settings. Historically, most measures of team resilience have relied on measuring individual resilience and averaging those results to use as an indicator of a team's resilience. This approach diverges from recent observations and frameworks indicating that team resilience is a distinct (and emergent) property from individual-level resilience. There are a few recent measures that better account for the distinction by measuring perceptions of the team entity (as opposed to oneself). However, it seems there is no single measure that applies (1) across a broad range of professional industries/fields, (2) to a balanced gender distribution, and (3) in both low-and-middle-income and high-income nations. In order to effectively measure a team's resilience as a collective unit, and in ways that are more widely applicable across more diverse and balanced demographics, we set out to develop a new psychometrically sound measure of team resilience.

Development of the Assessment

Development of the Team Resilience Index was, firstly, informed by the theoretical framework underlying the factor structure of the (individual) **Resilience Index** – a peer-reviewed published instrument that has been demonstrated to be a reliable and valid measure of psychological resilience. Taking this theoretical framework into account along with existing scientific literature on team resilience, an expert panel[1] identified various constructs believed to underlie fundamental elements of team resilience. Following this, the various constructs were populated with items, which were subsequently reviewed by the panel and amended where applicable.

Importantly, and in line with our aim to measure team resilience as the property of a collective unit (as opposed to a self-referential/individual-level property), we framed the introduction to our items in one of two ways: "***As a team***, in general…" and "In ***our team***, generally…". This is in contrast to self-referential questions that are typically framed in the following way: "In general, ***I*** tend to…".

The Sample

The original sample consisted of 299 individuals working in teams in organizations. 48.8% of participants identified as men, 49.2 % as women, and 1.8% of participants chose not to disclose their gender identity. The average age of the sample was 38. Finally, the sample was recruited from 8 different countries (regions included are Africa, Australia, Europe, and the United States), and from ≥15 different job levels, ≥15 different departments, ≥15 different industries, and ≥15 different obtained HLOEs (highest levels of education).

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1 The expert panel was made up of experts from the fields of neuropsychology, organizational psychology, and general psychology.

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Results

Component Extraction

We ran principal component analysis (PCA) as a method of component extraction. Results show that the Kaiser-Meyer-Olkin measure of sampling adequacy exceeded the recommended threshold of 0.600, indicating the suitability of the data for PCA. Bartlett's test of sphericity was highly significant ($p < 0.001$), affirming the presence of underlying correlations among the items. PCA revealed 3 components, explaining a cumulative variance of 66%. The factor loadings for each item were examined to identify the patterns of item-group relationships. The item correlations revealed a significant relationship among items ($p < 0.01$), with an average correlation size of 0.450, which is considered large. These results provide support for the underlying latent variable's coherence. The communalities ranged from 0.563 to 0.872, indicating the proportion of variance in each item explained by the different components. Loadings ranged from 0.545 to 0.855, with an average loading of 0.697, which is considered very high. These results signify the strength of each item's association with the underlying components. The loading cut-off for retaining items was 0.500, which is considered very robust. See below for an outline of examples of constructs that fall under each component extracted via PCA:

COMPONENT 1	COMPONENT 2	COMPONENT 3
Trust	Collective Self-Care	Learned Helplessness
Team Efficacy	Emotional Support	
Stress Inoculation	Cognitive Reappraisal	
Tenacity		
Forgiveness		

The constructs contained in component 1 predominantly refer to the collective psychological traits of the team, for example, the degree of trust between team members, whether they readily forgive each other's mistakes, how efficient they are as a team, whether they possess a collective sense of tenacity, as well as how they respond to and learn from stressful experiences as a team. Constructs in component 2 refer to, for example, whether there is a culture of self-care present in the team, whether team members look out for each other, emotionally support each other, are willing to be vulnerable in front of one another, as well as whether they collectively utilize mental-adaptation strategies like cognitive reappraisal when faced with challenges. Finally, component 3 refers to the (reverse-scored) collective experiences of learned helplessness in the team, for example, regularly feeling like things are out of their hands and that they have no control over their environment.

Reliability Testing

The internal consistency of the questionnaire was assessed using Cronbach's alpha. Put simply, internal consistency refers to how well the items that fall under each component 'work together' to reliably measure the same thing (i.e. one of three components of team resilience).

The desired range of Cronbach's alpha is between 0.700 and 0.900. A higher value is indicative of higher reliability, while a value exceeding 0.900 is indicative of possible redundancy in the measure. Results show that all components exhibited very high reliability: component 1 = 0.888, component 2 = 0.872, and component 3 = 0.866. These results confirm that the Team Resilience Index is a highly reliable measure. Furthermore, the average corrected total item correlations demonstrated consistent strength across components: component 1 = 0.688, component 2 = 0.667, and component 3 = 0.766.

Validity

The newly developed Team Resilience Index exhibits robust face validity, as confirmed by a comprehensive evaluation conducted by a panel of subject matter experts. The panel, comprising 5 individuals with extensive expertise in neuropsychology, organizational psychology, and general psychology, carefully examined each item within the measure to assess its clarity, relevance, and alignment with the theoretical construct. Their expert judgment affirmed that the items in the measure intuitively and perceptibly capture the essence of team resilience. The rigorous scrutiny by the panel ensures that the measure's items are readily understandable and directly reflect the intended concept. Consistent with the development of new measures, research is ongoing in order to demonstrate additional forms of validity.

Discussion & Conclusion

Results from the present study provide evidence that the newly developed measure, the Team Resilience Index, exhibits robust psychometric properties. The KMO statistic and Bartlett's test confirm the adequacy of the data for principal component analysis. The high proportion of explained variance, along with significant item correlations and loadings, supports the questionnaire's validity. Moreover, the internal consistency and corrected total item correlations underscore the reliability of the questionnaire's components. Results from this study provide strong support for the suitability of the Team Resilience Index to reliably measure a team's resilience. Furthermore, creating a reliable measure of team resilience that assesses the team's resilience (1) as a collective unit, (2) in more gender-balanced teams, (3) among teams from various economic settings, and (4) across multiple industries, job levels, education levels, and departments, is an important and novel contribution to the field.