

A Measure of Team Resilience

Developing the Resilience at Work Team Scale

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Objective: This study develops, and initial evaluates, a new measure of team-based resilience for use in research and practice. **Methods:** We conducted preliminary analyses, based on a cross-sectional sample of 344 employees nested within 31 teams. **Results:** Seven dimensions were identified through exploratory and confirmatory factor analyses. The measure had high reliability and significant discrimination to indicate the presence of a unique team-based aspect of resilience that contributed to higher work engagement and higher self-rated team performance, over and above the effects of individual resilience. Multilevel analyses showed that team, but not individual, resilience predicted self-rated team performance. **Conclusion:** Practice implications include a need to focus on collective as well as individual behaviors in resilience-building. The measure provides a diagnostic instrument for teams and a scale to evaluate organizational interventions and research the relationship of resilience to other constructs.

Jobs demands are changing, with frequent industry and organizational restructuring¹⁻⁴ creating fast-paced change and uncertainty.^{5,6} Along with increased competition and higher customer expectations,⁷ reduced investment in human resources means that employee workloads are often high.⁶ These trends are consistent across private, public, and nonprofit sectors.^{2,5,6,8}

As a result, many employees experience higher levels of stress and anxiety,^{9,10} while organizations are affected by reduced work performance and increased absenteeism.^{11,12} As many employees work within teams, these demands can also disrupt aspects of team dynamics and effectiveness, resulting in narrowing of attention and perspective,¹³ poor communication and information sharing,¹⁴ and reduced teamwork and performance.^{15,16}

Due to increased pressure on employees and teams, employers are turning to resilience as a potential means to build the adaptability, performance, and well-being of their workforce.^{17,18} Employers seek a work environment that ensures optimized and sustainable performance—in other words, one that safeguards organizational productivity while preserving the well-being of its employees.^{19,20}

Benefits of building employee resilience have been observed across a range of occupations, including policing, health care, and education. They include an improvement in mental and subjective well-being²¹⁻²⁴; improved optimism and self-efficacy²⁵⁻²⁸; and increased job satisfaction.²⁹ Resilience building has also been found to improve goal attainment³⁰ and productivity.²²

While research on individual workplace resilience has thrived over the past decade, understanding of how work teams foster resilience is still in its infancy. Nevertheless, there is growing interest in team resilience both as a theoretical construct and as a practical organizational resource. Hence, there is a corresponding need for clear, comprehensive definition and accurate measurement.

This paper aims to respond to this need by reporting the development and validation of a new measurement of team resilience—the Resilience at Work Team (R@W) Scale.

We begin with an overview of conceptual approaches to workplace resilience and its potential role in individual adaptation and thriving in the workplace. We describe both individual (personal) and team resilience, construing them as separate, albeit related, constructs, and argue that each makes independent contributions to workplace outcomes. We then describe the process of developing and evaluating the Resilience at Work Team Scale. Next, we explore how the resulting measure of team resilience relates to individual and team outcomes (team performance, worker engagement, and emotional exhaustion) separately from individual resilience. We conclude by examining practical implications.

CONCEPTUALIZING RESILIENCE IN THE WORKPLACE

During recent decades, individual (personal) resilience has attracted research attention across diverse disciplines, including biology and health sciences,^{31,32} child development³³ life-span development,³⁴ and, more recently, organizational psychology, and behavior.^{18,34-36} According to Fletcher and Sarkar,³⁷ the many definitions emerging from this literature share the assumption that resilience entails positive adaptation to change or disruption, usually (but not necessarily) to change involving adversity.

Conceptual approaches differ in important ways, however, including over whether resilience is trait-like (stable) versus state-like (malleable), and whether it is best characterized in terms of antecedents, processes, or outcomes of adaptation. Specifically, resilience may be regarded as (1) a *capacity* that makes effective adaptation more likely^{31,38}; (2) the *mechanisms* (physiological, psychological, behavioral, social) by which effective adaptation is achieved^{32,39}; (3) the *positive* indicators that effective adaptation has occurred (recovery, equilibrium maintenance, bouncing back)³³; or (4) some combination of the above.⁴⁰

Within work and organizational psychology, there are also diverging conceptual approaches. Defining resilience as “the positive psychological capacity to rebound, to ‘bounce back’ from adversity, uncertainty, conflict, failure, or even positive change, progress, and increased responsibility,” Luthans et al^{35,36} (p. 702) characterized resilience as a state-like “positive organizational behavior” that is developable and amenable to organizational intervention. By contrast, Shin et al¹⁸ conceived psychological resilience as “trait-like” (p. 728), while nevertheless proposing it to be a malleable resource that can be accumulated as a protection against future resource loss. Bardoel et al¹⁷ proposed several possible human resource interventions to boost individual workplace resilience, including work-life balance practices, diversity management, and employee development programs.

From an organizational standpoint, we draw on these diverse perspectives and conceptualize individual workplace resilience as “the capacity to manage the everyday stress of work and remain healthy, rebound and learn from unexpected setbacks and prepare for future challenges proactively.”⁷ As we conceptualize individual workplace resilience as resulting from a dynamic and interactive process, we also assume that individuals’ capacity for resilience can

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be developed through assessment of responses to existing challenges and modifying behaviors to align with actions known to be related to resilience.⁴¹

TEAM RESILIENCE AT WORK

Team resilience is important because work is increasingly structured in and around teams⁴²—groups of individuals within an organization who share a clearly defined membership and are responsible for achieving shared goals.⁴³ Teams have been found to benefit organizations by increasing labor productivity, flattening management structure, reducing employee turnover,⁴⁴ facilitating organizational learning, and improving product development.⁴⁵ In addition, experimental research has demonstrated that teams outperform individuals on simulated tasks involving problem-solving, coordination, and control.^{46–48} Inevitably, difficulties also arise in teams, mainly associated with role and interpersonal conflict, and effective coordination.⁴⁹

Because workplace teams constitute the immediate social environment for many employees, they exert a profound effect on team member resilience and well-being and can promote or detract from an individual's actions toward building resilience. Research has testified that team dynamics are pivotal in shaping, not only members' roles within the team^{50,51} but also their experience as more or less valued team members,⁵² and their overall experiences of work itself.⁵³ Given that teams are collective entities,⁵⁴ they may exhibit attributes that, while generated by individual members, are grounded in team dynamics and capable of exerting unique influences on well-being and behavior.^{55,56} Team resilience can be viewed as one such set of attributes and behaviors. As an example, the extent to which team members encourage debriefing after difficult events or adapting to change will depend on team dynamics.

We define team resilience as the “the capacity of a group of employees within a team to manage the everyday pressure of work and remain healthy, to adapt to change, and to be proactive in positioning for future work challenges”⁷ (p. 14). We suggest that team resilience is a multifaceted, team-based, psychosocial resource; as such, it aids in reducing the deleterious effects of work-related stress, enhances work-related well-being, boosts adaptability and job performance, and assists teams to better prepare for future challenges or disruption.

We propose that team resilience includes collective behaviors that are important at a team level in managing emerging work challenges such as frequent shifts in roles or priorities, the fast pace of change and insufficient resources to address internal or external demands. It differs from psychological capital,⁵⁷ as this assesses the individual attributes of self-efficacy, optimism, hope, and resiliency rather than group behaviors. Team resilience extends the positive mindset contained within psychological capital to team-based actions such as workload monitoring and developing self-care practices.

We further propose that team resilience is different from, but complements, psychosocial safety climate (PSC), as this assesses freedom from psychological and social risk or harm and focuses more on policies, practices, and procedures for the protection of worker psychological health and safety.⁵⁸ There is some overlap, for example, in leaders creating a culture of self-care and good stress management practices, but most elements are different. Although PSC and team resilience are distinct constructs, we could expect that PSC creates an environment where teams are better empowered to engage in actions promoting resilience.

In addition, we propose that while team resilience has some overlap with organizational citizenship behaviors (OCBs),⁵⁹ in terms of persistent enthusiasm and assistance to others, it incorporates a broader range of factors critical to sustained performance in challenging work such as optimizing resources and building team capability.

While individual resilience is important in the workplace, the resilience of a team is more than the aggregated individual resilience of its members: while each person will contribute to the team's resilience, behaviors and strategies need to be collective and in alignment. A group of highly resilient individuals does not necessarily result in a resilient team if their strategies are not aligned. Conversely, counterproductive attitudes and behaviors within the team may work against the individual resilience of its members. As an example, an individual's actions to manage personal work demands can assist or detract from the stress placed on other team members.

In summary, although they are related, we argue that team and individual resilience are conceptually separable, and empirically, should be capable of differentiation via their independent contributions to individual and team outcomes (eg, worker engagement, worker exhaustion, and team performance). Importantly, as a product of team processes and relationships, team resilience should be more than merely the aggregated resilience of individual team members. In our study, we aimed to show this by measuring individual and team resilience separately, and analyzing their independent contributions to the outcomes (work engagement, emotional exhaustion, team performance).

MEASURES OF WORKPLACE RESILIENCE

Individual Workplace Resilience

For a workplace assessment tool to provide value (eg, in evaluating the effectiveness of a workplace intervention), it needs to incorporate valid and comprehensive measures. In selecting a measure of individual workplace resilience, we were guided by considerations such as: face validity; the sample used to develop the measure; an item set that was comprehensive enough to inform changes in personal behavior; and a focus on strengths as well as coping with adversity. Although the review by Windle³⁴ identified 15 measures purporting to assess individual resilience, all lacked complete information on their psychometric properties, leading the authors to conclude that there was no current “gold standard” measure. Subsequently, Robertson et al⁶⁰ undertook a systematic review of workplace training from 2003 to 2014 and recommended the use of contextually relevant measures, including the Workplace Resilience Inventory (WRI)⁶¹ and the Resilience at Work (R@W) Scale.¹

The WRI⁶¹ conceptualizes resilience as a process involving self-regulation of affective, cognitive, and behavioral domains to assist in recovering from a traumatic event. The scale, which was developed from a university student sample, comprises 60 items with questions requiring participants to consider an adverse event.

In comparison, the R@W Scale¹ comprises 20 items relating specifically to resilience within a person's work context, and tap into the respondent's self-perceived engagement in behaviors and attitudes believed to underpin resilience at work ($\alpha = 0.84$). The scale was developed using a sample of workers employed in professional and semi-professional roles. Original analyses identified seven orthogonal dimensions: living authentically, finding your calling (FYC), maintaining perspective, managing stress, interacting cooperatively, keeping healthy, and maintaining supportive networks at work. The R@W Scale met our criteria for use in this study.

Team Resilience

Compared with the attention given to individual resilience, considerably less has been devoted to measuring team resilience. Our literature search identified seven studies published between 2009 and 2016. Table 1 lists these studies and the measures used. Of the studies, six employed brief Likert-based scales (three to seven items), while the seventh developed a 50-item scale, intended to capture 10 theoretically derived dimensions of team resilience.⁶² An

TABLE 1. Overview of Scales Measuring Team Resilience

Author	Definition of Team Resilience	Measure of Team Resilience	Example Item	Population	Reliability/Validity	Comments
Blatt (2009)	"...the capacity to rebound from adversity strengthened and more resourceful."	Six-item measure with questions modified from the "Safety Organizing Survey" (Vogus & Sutcliffe, 2007) and the Brief Resilient Coping Scale (Sinclair & Wallston, 2004).	We actively look for ways to overcome the challenges we encounter.	122 entrepreneurial teams	Author reported high reliability and discriminant validity, however statistics are not reported.	Cross-sectional, correlational design. SEM analyses of aggregated team data showed that creativity (a) partially mediated the relationship between contracting practices and resilience, and (b) fully mediated the relationship between communal schemas and team resilience.
Meneghel et al. ⁷⁰	"...the capacity to bounce back from failure, setbacks, conflicts, or any other threat to well-being that they may experience."	Seven-item measure previously validated from Salanova et al (2012)	In difficult situations, my team tries to look on the positive side.	1,076 employees nested in 216 teams from 40 companies in service, industry, and construction sectors	Internal consistency: Cronbach alpha is 0.85 at individual level and 0.87 at team level.	Cross-sectional, correlational design. SEM analyses of aggregated team data showed that self-rated team resilience mediated the relationship between self-rated collective positive emotions and supervisor-rated in- and extra-role performance.
Salanova, Llorens, Cifre & Martinez (2012)	"...the ability to manage disturbances of the normal workflow and to recover a dynamically stable state that allows the organization's goals of production and safety to be achieved."	Seven items based on Mallak's (1998) principles for implementing resilience in organizations	My team makes sure to have resources (eg, information, emotional support, practical assistance and financial resources) to overcome crisis and difficult times	710 employees within 303 work units from 43 companies including education, manufacturing, and finance (Study 2)	Internal consistency: Cronbach alpha is 0.83 Validity: HERO model validated using 14 CEOs with 90% inter-rater agreement. Convergent validity and discriminant validity also reported.	Cross-sectional design. SEM data showed that employee health (comprising team efficacy, resilience, and engagement) mediated the relationship between healthy organizational resources and supervisor-rated healthy organizational outcomes.
Sharma and Sharma ⁶²	"...the ability of the teams/groups to bounce back and sustain in the facade of adverse conditions."	50 item measure with 10 factors adapted from Morgan et al.'s (2013) framework for team resilience in elite sport	Mistakes are openly discussed in the team in order to learn from them	152 IT executives including team leaders and project managers	Internal consistency: Cronbach alpha for total scale is 0.84 Validity: Model demonstrates convergent and discriminant validity	Cross-sectional design. Hierarchical CFA of team resilience items indicated best-fitting model as 10 first-order factors, loading on four second-order factors, loading on one overarching team resilience factor. (continues)

TABLE 1. (Continued)

Author	Definition of Team Resilience	Measure of Team Resilience	Example Item	Population	Reliability/Validity	Comments
Stephens et al ⁶⁹	“...the ability of individuals, groups, and organizations to absorb the stress that arises from these challenges and to not only recover functioning back to a “normal” level but also learn and grow from the adversity to emerge stronger than before.”	Three-item measure designed to assess a team’s capacity to bounce back from a setback (Study 2)	This top management team knows how to cope with challenges	82 top management teams from Israeli firms	Internal consistency: Cronbach alpha for total scale is 0.92	Cross-sectional design. In Study 2, multiple regression analysis of team-level data showed that ‘emotional carrying capacity’ mediated the relationship between trust and team resilience.
van der Kleij et al ⁸⁷	“...the ability of teams to respond to sudden, unanticipated demands for performance quickly and with minimum decrement of performance.”	Five-item measure based on Woods’ (2006) definition of resilience to recognize, adapt to, and handle unanticipated perturbations.	As a team we were very much capable of anticipating surprising task disturbances.	105 students randomly assigned to 35 three-person teams.	Internal consistency: Cronbach alpha for total scale is 0.85.	Experimental design. IV (team resilience training) with 3 levels (transformational, transactional, none). Four DVs (recovery, performance, adaptation, perceived resilience). Results of one-way ANOVAs showed that participants receiving transformational training scored higher on recovery and adaptation but not on performance or self-rated resilience than those in the other two groups.
West, Patera and Carsten (2009)	“...team resilience serves to provide teams with the capacity to bounce back from failure, setbacks, conflicts, or any other threat to well-being that a team may experience.”	Six items adapted from PsyCap questionnaire, using the referent-shift approach to adapt individual capacities to team capacities (Luthans et al ⁵⁷). Optimism and team efficacy were also measured, giving three positive organizational behaviors (POBs) in total.	Our team usually manages difficulties one way or another when working.	308 university students randomly assigned to 101 teams	Internal consistency: Cronbach alpha is 0.76	Repeated measures design. Participants completed identical project tasks on four occasions, with predictors (POBs) assessed before, and outcomes (cohesion, cooperation, coordination, team satisfaction, conflict) after, task completion at T1 and T4. Hierarchical regression analysis of aggregated team data at T4 showed that after controlling for T1 levels of the DV, team resilience predicted cohesion and cooperation at T4.

additional article (not empirically based, so not listed in Table 1; Alliger et al⁶³) proposed 40 resilience behaviors forming three putative categories for dealing with stressful events: (1) anticipating and planning beforehand to minimize their impact, (2) managing them as they occur, and (3) recovering from or adapting to their effects (mending).

The measure developed in the present study was intended for use, not only in research but also as a comprehensive workplace assessment and development tool. We built upon the R@W described above¹ by addressing the collective team behaviors needed to support employees who work in challenging work environments. We incorporated factors known to be integral to team effectiveness,^{64–66} and we also included aspects that have begun to emerge as being critical for performance in demanding work environments. These include the capacity to be proactive in anticipating and adapting to change, to maintain well-being in pressured environments, and to optimize use of resources.^{67,68}

In summary, the criteria for instrument development were that the final measure of team resilience should (1) incorporate core elements of team effectiveness as well as the additional elements required for adaptability and sustained performance in challenging jobs; (2) be relevant to the work context; (3) focus on performance and well-being; (4) take a systematic approach by complementing a prior measure of individual resilience; (5) identify actions within the influence of the team to change (to allow teams to assess and develop resilience); and (6) be applicable across different occupations and organizational levels.

Because its referent is “the team” (we/us) rather than the person (I/me), we considered it inevitable that team resilience would be influenced by group membership.⁶⁹ Hence, multilevel analysis⁷⁰ would be required to model both individual (within-groups) and team (between-groups) effects. In contrast, because individual resilience refers to the individual (I/me), we expected to observe its effects primarily at the individual level (within-groups) only. As an outcome, team performance could be expected to reflect both collective and individual influences. Again, by contrast, emotional exhaustion and work engagement refer to the self, rather than the group, so individual level effects could be expected to predominate.

We Tested the Following Hypotheses

Within-Group (Individual) Effects

Hypothesis 1: Team resilience will be positively correlated with individual resilience.

Hypothesis 2: Independently of team resilience, individual resilience will be positively related to (1) work engagement, (2) negatively related to emotional exhaustion, and (3) positively related to team performance.

Hypothesis 3: Independently of individual resilience, team resilience will be positively related to (1) work engagement, (2) negatively related to emotional exhaustion, and (3) positively related to team performance.

Between-Group (Team) Effects

Hypothesis 4: Team resilience at the group level will be positively related to group-level team performance.

METHODS

Design and Participants

A cross-sectional, correlational design was employed. An electronic survey was administered on a single occasion to 345 participants across several work sites. Thirty-one work units were represented across three industry sectors (state government, private, and not-for-profit). The average work unit size was 11 (range 4 to 20), and the number of units (teams) was 31.

Table 2 summarizes the sample composition. Respondents were mostly female (80%, $n = 276$); aged between 45 and 46 years, and employed in permanent positions (79%). Of those who were not employed in permanent positions, most held temporary, fixed-term contracts (17%), while very small numbers were employed on demand as casual staff or as private contractors. Employment sectors included disability, finance, education, community and social services, health, and defence.

MEASURES

Team Resilience ($\alpha = 0.95$)

Fifty-four items were initially generated. These were based on team behaviors that could be expected to foster individual behaviors listed in the R@W Scale, elements of team effectiveness, and professional observations, by the first author, of elements that work for and against resilience for teams in challenging jobs. These observations were collected through leadership coaching assignments and in-house workshops across diverse industry sectors. Two organizational psychologists reviewed items for relevance based on their experience in working with teams in pressured and changing work environments.

Scoring for each item was on a 7-point scale (1 = strongly disagree, 7 = strongly agree, with reverse scoring for negatively phrased items).

Individual (Psychological) Resilience ($\alpha = 0.84$)

The R@W Scale¹ was used to capture personal resilience at work. The R@W Scale is a 20-item scale comprising seven resilience dimensions: living authentically (eg, “I have important core values that I hold fast to in my work-life”), finding one’s calling (eg, “The work I do helps to fulfil my sense of purpose in life”), staying healthy (eg, “I have a good level of fitness”), mastering stress (eg, “I have developed some reliable ways to relax when I am under pressure at work”), interacting cooperatively (eg, “I believe in giving help to my colleagues as well as asking for it”), building networks (eg, “I have a strong and reliable network of supportive colleagues at work”), and maintaining perspective (eg, “Nothing at work ever really fazes me for long”). Each item was scored on a 7-point scale (1 = strongly disagree, 7 = strongly agree).

Work Engagement ($\alpha = 0.86$)

The nine-item Utrecht Engagement Scale⁷¹ was used to capture three dimensions of work engagement: vigor (energy, effort, and persistence; eg, “I feel strong and vigorous in my work”), dedication (involvement, enthusiasm, and pride in one’s work; eg, “My job inspires me”), and absorption (concentration, engrossment, and intense enjoyment of one’s work; eg, “I become completely immersed in my work”). Scoring was 1 = never, through 5 = almost all of the time.

Emotional Exhaustion ($\alpha = 0.86$)

Five items from the emotional exhaustion subscale of the Maslach Burnout Inventory⁷² captured participants’ experiences of chronic emotional and physical job-related exhaustion (eg, “I feel used up at the end of the workday”; 1 = never, through 5 = almost all of the time).

Team Performance ($\alpha = 0.86$)

Five items were purposely developed to capture putative dimensions of performance, such as respect from the organization, reputation for customer service, positive judgements of team performance by others’, and the team’s capacity to respond adaptively to setbacks. Response alternatives ranged from 1 = strongly disagree through 7 = strongly agree.

TABLE 2. Pearson's r Bivariate Correlations Between Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Age	—																				
2. Gender	-0.06	—																			
3. Individual resilience	0.13	0.03	0.84																		
4. Team resilience	0.01	0.06	0.58	0.98																	
5. Engagement	0.14	0.14	0.48	0.49																	
6. Exhaustion	-0.18	-0.07	-0.45	-0.42	-0.50																
7. Team performance	0.03	0.00	0.52	0.77	0.44	-0.33															
8. Living authentically	0.19	0.09	0.58	0.52	0.59	-0.32	0.47														
9. Managing stress	0.18	0.04	0.77	0.44	0.31	-0.30	0.40	0.31													
10. Maintaining Perspective	0.08	-0.01	0.70	0.42	0.20	-0.45	0.38	0.21	0.49												
11. Maintaining Health	-0.03	-0.02	0.71	0.27	0.26	-0.18	0.23	0.19	0.44	0.22											
12. Team processes	-0.02	0.04	0.54	0.97	0.48	-0.38	0.75	0.50	0.42	0.38	0.25										
13. Promoting self-care	-0.01	0.11	0.53	0.82	0.39	-0.36	0.61	0.49	0.47	0.39	0.18	0.75									
14. Managing negativity	0.05	0.05	0.47	0.82	0.38	-0.43	0.61	0.37	0.33	0.38	0.24	0.70	0.59								
15. Maintaining positivity	-0.01	0.13	0.45	0.78	0.43	-0.31	0.58	0.44	0.32	0.29	0.23	0.73	0.63	0.57							
16. Exhaustion 1	-0.16	-0.06	-0.48	-0.44	-0.50	0.97	-0.36	-0.34	-0.31	-0.47	-0.21	-0.39	-0.38	-0.45	-0.33						
17. Exhaustion 2	-0.18	-0.08	-0.36	-0.34	-0.43	0.93	-0.25	-0.25	-0.25	-0.37	-0.12	-0.31	-0.29	-0.35	-0.25	0.80					
18. Vigor	0.19	0.07	0.51	0.46	0.89	-0.48	0.43	0.55	0.35	0.25	0.30	0.45	0.35	0.37	0.41	-0.49	-0.40				
19. Dedication	0.12	0.14	0.52	0.53	0.87	-0.56	0.45	0.63	0.32	0.25	0.27	0.51	0.44	0.41	0.44	-0.57	-0.48	0.75			
20. Absorption	0.04	0.14	0.18	0.26	0.77	-0.23	0.23	0.33	0.10	0.01	0.10	0.26	0.21	0.19	0.24	-0.22	-0.23	0.46	0.48		
21. Team performance 1	0.06	0.02	0.45	0.65	0.37	-0.27	0.93	0.45	0.35	0.30	0.19	0.65	0.53	0.50	0.47	-0.30	-0.19	0.37	0.40	0.18	
22. Team performance 2	0.03	0.04	0.48	0.73	0.42	-0.34	0.82	0.36	0.37	0.39	0.23	0.70	0.62	0.60	0.58	-0.35	-0.28	0.40	0.40	0.25	0.56

Correlations of $r \geq 0.13$ are significant at $P \leq 0.05$; Values for Cronbach alpha are listed on the diagonal.

PROCEDURE

The opportunity for participation in this study was promoted via the first author's LinkedIn network of approximately 1000 contacts. An invitation was posted with acceptance based on promptness of response. A team report of results on the nonvalidated scale was provided as an incentive. Those expressing interest received an overview of the research, including its aims; expectations of participants; steps in the process; confidentiality of data; report format; and adherence to Australian Psychological Society ethics. This information was provided to team leaders for discussion with their teams before agreement to participate.

Respondents included team members and team leaders, with an approximate 35% response rate—which is considered common.⁷³ Before acceptance into the study, however, each team leader was required to sign a declaration that participation of all team members would be voluntary, that the team report provided would be held confidentially within the team and not shared within the organization or with others outside the organization, and that team members would be assured that their position in their team and the organization would not be affected by participation.

The survey was conducted using the Qualtrics on-line secure data platform. Data were collected by a web link provided to the team leader for distribution. At the beginning of the survey, participants confirmed that they were taking part voluntarily and free to withdraw at any time. Contact numbers for counselling services were provided in case participation raised personal issues or caused distress. It was confirmed that the information supplied would be kept confidential and that individual information would not be identifiable from data contained in any resulting publication. Participants did not receive any remuneration for taking part.

A summary team report of de-identified ranges and averages on each item was provided to the team through the team leader for discussion.

ANALYSES

Analyses were conducted in four steps. First, exploratory factor analyses (EFAs) were performed of the team and individual resilience scales separately to examine the dimensions and internal structure of each. Second, confirmatory factor analyses (CFAs) were carried out of the pooled items from both scales to examine their discriminative properties as well as their degree of convergence when analyzed in combination. Third, structural equation modeling, including all latent variables and indicators, was carried out in a global analysis of the predicted relationships at the individual level. Finally, multilevel analyses were conducted on team performance to determine whether team resilience would predict team performance at the team level, over and above the individual-level effects of both team and individual resilience.

EFA, CFA, SEM, and multilevel analyses were carried out using Mplus version 7.4 (Muthen & Muthen, Los Angeles, CA).⁷⁴ Mplus has the advantage of producing comparable model fit indices across a range of analyses, while the EFA option in Mplus allows models with different factor compositions to be compared within a single analysis. Factor analyses and SEM used maximum likelihood estimates. According to Cortina et al.,⁷⁵ the maximum likelihood method is robust to violations of multivariate normality, and is preferable to distribution-free methods that require much larger samples than those that are typically available in organizational research.

All analyses besides those listed above were conducted using SPSS version 17 (SPSS Inc, Chicago, IL).⁷⁶

RESULTS

Exploratory Factor Analyses

EFAs were carried out on data from 344 of the initial pool of 345 participants. Data from the remaining participant, who did not complete the team resilience measure, were excluded from analyses.

Team Resilience

Initial inspection of item scores identified five items with unacceptably high values of skewness and kurtosis (standard error $> +/−7$; see Klein).⁷⁷ Further examination indicated general or ambiguous content in each case, together with item distributions characteristic of floor, ceiling, or bimodal effects. These items were excluded from further analysis.

A factor analysis using maximum likelihood estimates was conducted on the remaining 49 items. This identified seven factors with eigenvalues more than 1 and 42 items yielding factor loadings of at least 0.45.⁷⁷ The dimensions reflected themes of resourcefulness (10 items, $\alpha = 0.93$), robustness (eight items, $\alpha = 0.85$), self-care (seven items, $\alpha = 0.87$), alignment (five items, $\alpha = 0.88$), capability (seven items, $\alpha = 0.89$), connectedness (two items, $r = 0.81$), and perseverance (three items, $\alpha = 0.83$). Correlations among the factors ranged from $r = 0.29$ to $r = 0.81$, $P < 0.001$. Together, the factors accounted for 63% of the variance in item scores.

Individual Resilience

A similar EFA procedure was carried out on the 20 individual resilience items. Six factors were identified, with 18 items producing loadings of 0.45 or more, and 57% of the variance accounted for. The factors corresponded to six of those found by Winwood et al.¹: (1) finding your calling (four items, $\alpha = 0.80$), (2) managing stress (three items, $\alpha = 0.72$); (3) maintaining perspective (four items, $\alpha = 0.72$); (4) staying healthy (three items, $\alpha = 0.84$), (5) living authentically (two items, $r = 0.39$); and (6) interacting cooperatively (two items, $r = 0.40$). Correlations among the six factors were modest, however, ranging from $r = 0.18$, to $r = 0.49$. The seventh component by Winwood et al.,¹ “building networks” did not emerge from our analyses.

For the full scales, internal reliability was $\alpha = 0.83$ for individual resilience and $\alpha = 0.98$ for team resilience (Table 3).

Confirmatory Factor Analyses

On the basis of the EFA results, CFAs were conducted of the pooled team and individual resilience items (60 items, comprising 42 team and 18 individual resilience). The purpose of the CFAs was to examine the discriminant properties of the two measures when analyzed in combination. That is, although we anticipated that the two measures would be highly correlated, we wanted to establish whether they could be differentiated at the measurement level, and to demonstrate that at the predictive level, each would be capable of accounting for independent portions of variance in the outcomes under investigation.

Initially, items were loaded on the respective first-order factors indicated by the prior EFA results—seven for team and six for individual resilience. Then, all first-order factors were loaded on a single higher-order “resilience” factor (the “single-factor model”). Subsequently, two second-order factors, corresponding to team and individual resilience, were modeled, and first-order factors were specified to load accordingly (the “two-factor model”). In this two-factor model, modification indices were used to identify significant cross-loadings that could indicate items and/or factors that were common to both constructs, and therefore of limited value in differentiating between them. The fit of the two-factor model was compared with that of the single higher-order factor model using the Chi-square difference test.

CFA results are summarized in Table 4. The top portion of the table shows first-order factor-only models. While the first model (M1.1), based on all 60 items, produced acceptable fit, modification indices showed that the individual resilience item, “Generally I appreciate what I have in the workplace” (an indicator of FYC)

TABLE 3. R@W (Resilience at Work) Team Components and Sample Items

Component of Team Resilience	Component Description	Sample Items
Resourceful (10 items)	Harnessing team member strengths and resources and building a culture of continuous improvement. Developing effective team processes that enable a clear focus on priorities.	We optimize the resources we have. We are focused on continually improving how we do our work.
Robust (eight items)	Having shared purpose, meaning and goals. Being adaptable to change and proactive when issues arise for the team.	We do not adapt well to change. Personal agendas often supersede common goals.
Perseverance (three items)	Staying optimistic and having a solution, rather than a problem, focus. Persisting in the face of obstacles.	We focus our energy on where we can make a difference. We have effective problem solving and decision-making processes.
Self-care (seven items)	Promoting and deploying good stress management routines and being alert to overload in members. Supporting life-work balance.	We promote self-care in our daily work routines and practices (eg, breaks, working hours). We are alert to and respond to early signs of overload in team members.
Capability (seven items)	Seeking feedback and building on what works well. Continually building capacity through accessing networks and supports.	We seek out and act on feedback relating to our performance. We have a variety of ways to develop our skill and knowledge.
Connected (two items)	Being cooperative and supportive with each other. Encouraging a sense of belonging.	We cooperate and provide positive support to each other to get the job done. We encourage each other to feel part of the team.
Alignment (five items)	Aligning to create the desired outcomes. Being optimistic, noticing progress and celebrating success.	We seek out and acknowledge progress when good news is hard to find. We focus on possibility not negativity.

would load significantly on all seven team resilience first-order factors, thereby suggesting lack of discrimination. Removal of this item (M1.2) significantly improved model fit, $\Delta\chi^2(58) = 124.34$, $P < 0.001$, while the internal reliability of the remaining three items of FYC was satisfactory, $\alpha = 0.79$. Hence, all subsequent analyses were based on 59 items.

The lower sections of Table 4 show the fit indices of one single-factor (M2.1) and three two-factor (M2.2-M2.4) higher-order models, all based on analysis of 59 items. Modification indices derived from the first two-factor model (M2.2) indicated that the putative individual resilience factor FYC would load just as well on team resilience as on individual resilience. However, running two subsequent models, in which FYC was loaded either on team resilience alone (M2.3), or on both individual resilience and team resilience (M2.4), failed to establish that any one of the models was clearly superior to the other two (see bottom right section of Table 4). Hence, we resolved to explore the position of FYC further in later SEM analyses.

Descriptive Statistics and Correlational Analyses

Global measures of team resilience, individual resilience, work engagement, emotional exhaustion, and team performance were computed by averaging the respective item scores. Item parcels corresponding to the factors derived from EFA and CFA were similarly computed to be included as indicators of latent variables in individual-level SEM. In addition, three item-parcel indicators (corresponding to vigor, dedication, and exhaustion) were computed for engagement, and two split-half indicators each for emotional exhaustion and team performance.

Means, standard deviations, internal reliability coefficients, and variable inter-correlations are presented in Table 5. Consistent with expectations, team and individual resilience were strongly correlated ($r = 0.60$, $P < 0.001$), supporting Hypothesis 1. Team resilience was highly positively correlated with team performance, was moderately positively correlated with work engagement, and was negatively correlated with exhaustion. Individual resilience displayed a similar pattern. Among the subscales, there were strong

correlations between the individual resilience factor FYC and both the vigor ($r = 0.55$, $P < 0.001$) and dedication ($r = 0.63$, $P < 0.001$) subscales of engagement.

Structural Equation Modeling at the Individual Level

We employed SEM to carry out a global test of the predicted relationships between the predictors (individual and team resilience and their indicators) and outcomes (engagement, exhaustion, team performance) at the individual level. This procedure also allowed further investigation of our measurement model, including the position of the putative individual resilience indicator, “FYC,” which, as described previously, our CFAs had shown as loading equally well on individual and team resilience.

Our hypothesized model consisted of two latent predictors (individual and team resilience), and three latent outcomes (engagement, exhaustion, team performance), together with their respective indicators as described in the previous section. We compared model fit when FYC was loaded on individual resilience with one in which it was loaded on team resilience only.⁷⁴ Subsequent re-specifications of the model were guided by modification indices. Successive nested models were evaluated according to the Chi-square difference test, while non-nested models composed of identical observed variables (in this case, identical indicators of latent variables) were compared using the Bayesian information criterion (BIC), which does not require models to have different degrees of freedom.^{74,78}

The results of SEM are summarized in Table 6. As indicated, and consistent with prior CFAs, loading FYC on both individual and team resilience (SEM1.3) produced slightly better model fit than loading FYC on either individual resilience alone (SEM1.1) or team resilience alone (SEM1.2). However, fit was more substantially improved in a fourth model (SEM1.4), when, in accordance with modification indices, FYC was specified as an indicator of *work engagement* rather than of either individual or team resilience. Consistent with hypotheses, in this new model, individual resilience and team resilience both emerged as significant positive predictors

TABLE 4. Confirmatory Factor Analyses of Team Resilience at Work Scale and Individual Resilience at Work Scales (Maximum Likelihood Estimates)

Model	No. of Items	Description	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA	M1 – M2	$\Delta\chi^2$	Δdf	Sig $\Delta\chi^2$
Team + Individual Resilience: first order only													
1.1	60 (42 × TR, 18 × IR)	13-factor (7 × TR, 6 × IR) + 3 × pairs within-factor correlated error terms	3,266.89	1,628	2.01	0.87	0.86	0.05	0.05				
1.2	59 (42 × TR, 17 × IR)	M3.1 minus "Generally, I appreciate what I have in my environment."	3,142.55	1,570	2.00	0.88	0.87	0.05	0.05	1.1–1.2	124.34	58	<0.01
Team + Individual Resilience: second order													
2.1	59 Single-factor model	M1.2 + one higher order factor	3,367.86	1,633	2.06	0.86	0.86	0.05	0.06				
2.2	59 Two-factor model	M1.2 + two higher order factors, FYC loading on IR only	3,349.60	1,632	2.05	0.87	0.86	0.05	0.06	2.1–2.2	18.26	1	<0.001
2.3	59	M1.2 + two higher order factors; FYC loading on TR only	3,350.33	1,632	2.05	0.87	0.86	0.05	0.06	2.1–2.3	17.53	1	<0.001
2.4	59	M1.2 + two higher order factors; FYC cross-loading on IR & TR	3,345.87	1,631	2.05	0.87	0.86	0.05	0.06	2.1–2.4 2.2–2.4 2.3–2.4	21.99 3.73 4.46	2 1 1	<0.01 <0.10 <0.05

FYC, Finding Your Calling; IR, individual resilience; TR, team resilience.

of work engagement (H2a and H3a) and team performance (H2b and H3b), while individual resilience was a negative predictor of exhaustion (H1c). However, contrary to expectations (H3c), team resilience did not predict exhaustion independently of individual resilience. The model and standardized path coefficients are displayed in Fig. 1.

Multilevel Analyses

Finally, multilevel modeling (MLM) of individuals nested within teams was carried out.⁷⁹ To reiterate, MLM of the relationship between team resilience and team performance was considered warranted because of the likely influence of group membership on participants' responses, necessitating partitioning of variable scores into individual and group components.

For MLM purposes, rather than use the factor-level indicators, we constructed split-half indicators of team and individual resilience, as we had for exhaustion and team performance. This was to ensure that, in our analyses, the number of free parameters to be estimated did not exceed the number of clusters, thereby leading to model under-identification.⁷⁸ To determine whether any variables besides team resilience and performance also warranted MLM, we conducted a preliminary check to determine which, if any, displayed sufficient between-group variance, as indicated by the significance of one-way analyses of variance (ANOVAs) across teams, and intraclass coefficients [ICC (1)] of 0.10 or more.⁷⁸ The results are displayed in Table 7. As shown, team performance, team resilience, and their indicators satisfied these conditions, with ANOVAs yielding significant *F* values, and ICC (1) values ranging from 0.10 to 0.18—indicating in each case that between 10% and 18% of the associated variance was accounted for by group membership. Even though there were significant between-team differences for several other variables, however, none yielded an ICC(1) value of 0.10 or more. Overall, then, the results of preliminary checks confirmed our decision to conduct a multilevel analysis on TP only, modeling both individual resilience and team resilience as within-level predictors, and team resilience as a between-level predictor.

At the individual level (Level 1) of our multilevel analyses, all three variables were modeled as latent variables with two observed indicators each, and paths were modeled from individual and team resilience to team performance. At the group level (Level 2), team resilience and team performance were again specified as latent variables each with two indicators,⁸⁰ and a path specified from resilience to performance. Level 1 predictors were centered about the grand mean.⁸¹ We controlled for age at the individual level because of its bivariate association with individual resilience and engagement (see Table 5).

Nonstandardized estimates together with 95% confidence intervals for the hypothesized effects are reported in Table 8. Consistent with hypotheses (and with the prior SEM results), individual and team resilience each predicted team performance at the individual level, while team resilience also predicted team performance at the group level (H4). The model fit the data extremely well. Consistent with hypotheses and SEM results, individual and team resilience each predicted team performance at the individual level, while team resilience also predicted team performance at the group level (H3). Fit indices and observed relationships between the latent variables are depicted in Fig. 2.

DISCUSSION

This paper reports on the development and initial evaluation of a new measure of resilience among work teams, intended for use by researchers, organizational psychologists, and human resource practitioners. On the basis of a cross-sectional sample of 344 employees, our analyses showed that the measure had high internal reliability, with seven dimensions being identified through EFAs

TABLE 5. Means, Standard Deviations, Internal Reliability Coefficients, and Variable Intercorrelations

No. of Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27							
1. Age	45.18	11.68	—																																	
2. What is your gender?	1.81	0.40	-0.06	—																																
Full scales																																				
3. Team resilience	42	4.29	0.83	-0.02	0.07	0.98																														
4. Individual resilience	17	4.20	0.68	0.10	0.03	0.60	0.84																													
5. Engagement	9	4.30	0.64	0.14	0.14	0.49	0.50	0.86																												
6. Exhaustion	5	3.79	0.54	-0.18	-0.07	-0.42	-0.46	-0.50	0.86																											
7. Team performance	5	2.33	0.72	0.03	-0.01	0.77	0.55	0.44	-0.33	0.86																										
8. TR Resourcefulness	10	4.42	0.91	-0.02	0.04	0.93	0.56	0.47	-0.38	0.74	0.93																									
9. TR Robust	8	3.90	1.04	0.05	0.04	0.82	0.47	0.38	-0.43	0.62	0.68	0.85																								
10. TR Self-care	7	4.19	0.96	-0.04	0.09	0.85	0.56	0.42	-0.37	0.62	0.75	0.59	.87																							
11. TR Alignment	5	4.34	0.97	0.00	0.13	0.85	0.52	0.45	-0.34	0.64	0.75	0.63	0.69	.88																						
12. TR Capability	7	4.51	0.88	-0.02	0.09	0.91	0.51	0.47	-0.33	0.70	0.85	0.66	0.71	0.78	.89																					
13. TR Connectedness	2	4.67	1.06	-0.06	0.03	0.81	0.44	0.41	-0.28	0.64	0.76	0.62	0.66	0.70	0.76	.81																				
14. TR Perseverance	3	4.53	0.94	0.03	-0.01	0.82	0.54	0.39	-0.28	0.67	0.76	0.68	0.63	0.70	0.72	0.66	.83																			
15. IR Finding calling	3	4.75	0.90	0.19	0.09	0.52	0.58	0.59	-0.32	0.47	0.47	0.37	0.50	0.47	0.50	0.46	0.43	0.79																		
16. IR Staying healthy	3	4.36	1.22	-0.03	-0.02	0.26	0.65	0.26	-0.18	0.23	0.24	0.21	0.25	0.22	0.19	0.24	0.19	0.84																		
17. IR Managing stress	4	4.09	1.11	0.12	-0.01	0.41	0.78	0.26	-0.30	0.37	0.39	0.30	0.45	0.33	0.34	0.24	0.35	0.27	0.45	0.80																
18. IR Maintaining perspective	3	3.50	1.05	0.07	-0.04	0.44	0.71	0.26	-0.44	0.40	0.42	0.40	0.34	0.29	0.31	0.42	0.24	0.21	0.48	0.72																
19. IR Living authentically	2	5.08	0.73	0.16	0.04	0.15	0.35	0.21	-0.12	0.27	0.16	0.08	0.12	0.12	0.15	0.14	0.22	0.38	0.01	0.12	0.16	0.50														
20. IR Interacting cooperatively	2	4.66	0.89	-0.14	0.15	0.42	0.50	0.34	-0.27	0.32	0.35	0.25	0.38	0.42	0.46	0.30	0.35	0.27	0.27	0.32	0.16	0.12	0.56													
21. Vigor	3	3.81	0.64	0.19	0.07	0.47	0.52	0.89	-0.48	0.43	0.43	0.37	0.39	0.44	0.43	0.36	0.40	0.55	0.30	0.31	0.29	0.22	0.29	0.76												
22. Dedication	3	3.74	0.75	0.12	0.14	0.53	0.52	0.87	-0.56	0.45	0.49	0.41	0.47	0.47	0.49	0.44	0.40	0.63	0.27	0.28	0.31	0.15	0.31	0.75	0.84											
23. Absorption	3	3.81	0.58	0.04	0.14	0.26	0.21	0.77	-0.23	0.23	0.26	0.19	0.21	0.24	0.28	0.23	0.20	0.33	0.10	0.05	0.05	0.15	0.27	0.46	0.64											
24. Exhaustion 1	3	2.35	0.75	-0.16	-0.06	-0.44	-0.48	-0.50	0.97	-0.36	-0.40	-0.46	-0.39	-0.36	-0.34	-0.30	-0.31	-0.34	-0.21	-0.31	-0.45	-0.12	-0.27	-0.49	-0.57	-0.22	0.80									
25. Exhaustion 2	2	2.29	0.76	-0.18	-0.08	-0.34	-0.37	-0.43	0.93	-0.25	-0.32	-0.35	-0.30	-0.27	-0.27	-0.23	-0.20	-0.25	-0.12	-0.24	-0.36	-0.12	-0.25	-0.40	-0.48	-0.23	0.80	0.76								
26. Team performance 1	3	5.25	1.01	0.06	0.02	0.65	0.47	0.37	-0.27	0.93	0.65	0.49	0.54	0.53	0.60	0.54	0.55	0.45	0.19	0.32	0.31	0.28	0.26	0.37	0.40	0.18	-0.30	-0.19	0.88							
27. Team performance 2	2	5.37	0.97	-0.03	-0.05	0.73	0.51	0.42	-0.34	0.82	0.67	0.64	0.58	0.64	0.65	0.61	0.67	0.36	0.23	0.33	0.42	0.18	0.32	0.40	0.40	0.25	-0.35	-0.28	0.56	0.71						

Bivariate correlations are below the diagonal, reliability coefficients (*Cronbach alpha*) are on the diagonal. Correlations at 0.12 or more are significant at $P \leq 0.05$. IR, individual resilience; TR, team resilience.

TABLE 6. Results of SEM of Individual-Level Relationships (Maximum Likelihood Estimates)

Model	Description	χ^2	df	χ^2/df	CFI	TLI	SRMR	RMSEA	M1 – M2	$\Delta\chi^2$	Δdf	Sig $\Delta\chi^2$	BIC
SEM1.1	FYC on IR only	545.16	160	3.41	0.91	0.89	0.053	0.084					14,211.13
SEM1.2	FYC on TR only	550.79	160	3.44	0.91	0.89	0.056	0.084	1.1–1.3	2.32	1	ns	14,216.75
SEM1.3	FYC on IR and TR	542.84	159	3.41	0.91	0.89	0.056	0.084	1.2–1.3	7.95	1	<0.01	14,211.47
SEM1.4	FYC on Engagement	489.46	160	3.06	0.92	0.91	0.057	0.077					14,155.42

BIC, Bayesian Information Criterion; FYC, Finding Your Calling; IR, individual resilience; TR, team resilience.

and CFAs. While the measure was highly correlated with a prior measure of work-based individual resilience (the R@W Scale),¹ there was sufficient discrimination to indicate the presence of unique team-based aspects of resilience, and to demonstrate that team resilience was associated positively with work engagement and self-perceived team performance, over and above the effects of individual resilience. The correlation of the R@W Team Scale with the R@W Scale confirmed an association between individual and team resilience and supported our understanding that team behaviors foster or detract from an individual’s resilience, while the resilience of a team member impacts on the collective actions by a team to build resilience.

Our study contributes to the literature in four important ways. First, although there have been prior studies of team resilience, this is among the first to develop a comprehensive, multidimensional measure for use in both research and professional practice.⁶² Second, because we investigated the intersection between our team resilience measure and a prior existing measure of individual resilience (the R@W Scale),¹ we could make a preliminary empirical evaluation of the relationships between the scales, as well as of their capacity to discriminate between the two constructs they were

designed to measure. Third, because we included both measures in our analyses, we were able to identify their unique contributions to important individual and organizational outcomes. Finally, because we employed a multilevel approach, we were able to model the effects of team resilience at both the individual and the group level rather than simply at either level alone as previous studies have done.^{62,70} Together, these characteristics of our research engender confidence in the new measure as a potential tool both for research in applied settings, and for designing and evaluating team-based interventions in organizations.

Concerning the multidimensionality of team resilience, our analyses identified seven related dimensions: having robust team processes when issues arise; a culture of self-care; perseverance/positivity; strategies for resourcefulness; aligning to success; building capability; and feeling a sense of connectedness and belonging. Each of these dimensions comprise behaviors that are within the influence of a team to action, irrespective of wider organizational factors.

Overall, our factor analyses of the team and individual resilience items in combination supported the cohesiveness of the team resilience measure, but indicated less homogeneity in the

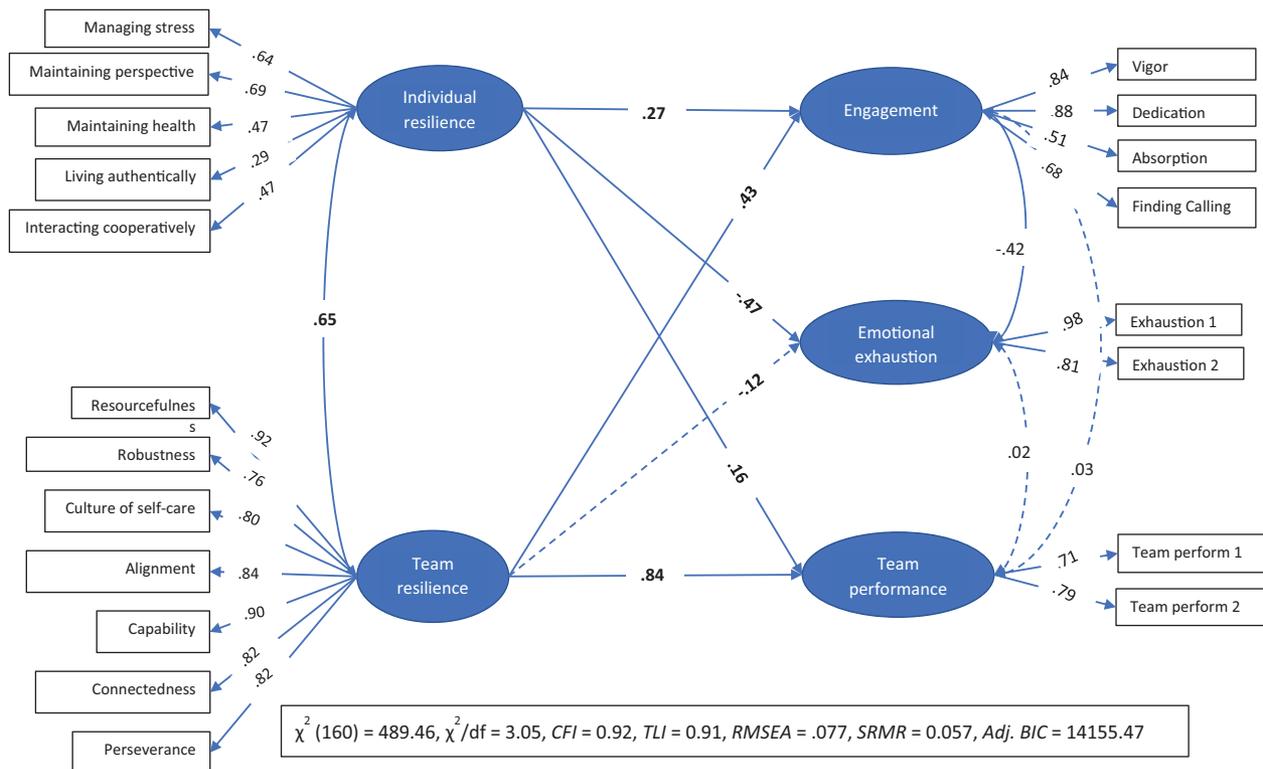


FIGURE 1. Final structural model linking individual and team resilience to engagement, emotional exhaustion, and team performance at the individual level. Note: All solid paths are significant at $P \leq 0.05$; broken paths are not significant.

TABLE 7. One-Way Analyses of Variance and Intraclass Coefficients for Observed Variables

Variable	F (30,313)	P	ICC[1]
Team resilience - all	3.63	0.00	0.17
Indicator 1	3.59	0.00	0.18
Indicator 2	3.14	0.00	0.15
Individual resilience - all	1.97	0.01	0.07
Indicator 1	1.68	0.02	0.07
Indicator 2	1.32	ns	0.04
Exhaustion - all	1.78	0.01	0.05
Indicator 1	1.85	0.01	0.07
Indicator 2	1.47	ns	0.05
Engagement - all	1.34	ns	0.02
Vigor	1.29	ns	0.04
Dedication	1.42	ns	0.04
Absorption	1.54	0.04	0.07
Team performance - all	2.98	0.00	0.15
Indicator 1	2.98	0.00	0.15
Indicator 2	2.34	0.00	0.12

individual resilience measure, as demonstrated by the finding of relatively low correlations among some individual resilience factors. The higher consistency of the team measure may be partly attributable to its collective referent (we/our rather than I/my). Nevertheless, the heterogeneity observed in the individual measure in the present study is consistent with the original findings of Winwood et al.¹ It also indicates the appropriateness of using structural equation modeling to specify the relationship between the latent construct of individual resilience and its subscale indicators as was the approach in the present study. We suggest that future studies continue to evaluate the structure and interpretation of the individual R@W Scale.

Despite being substantially correlated, team and individual resilience each contributed to individual-level engagement and team performance. This finding points to the importance of both individual strategies,⁸² and group processes and group identity⁸³ in shaping personal job-related motivation (higher engagement) and positive individual perceptions of team performance. These relationships held, regardless of group membership. However, the results illustrate the stronger influence of team resilience in shaping team performance, and showed that this relationship was, to some extent, shaped by group membership. In this regard, the team resilience strategies as assessed in the current study may be considered as a collective behavioral job resource that teams and their members may draw upon in handling present challenges and preparing for future ones.

While team resilience was negatively correlated with exhaustion, this relationship was not significant in multivariate analyses when the effects of individual resilience on exhaustion

TABLE 8. Results of Multilevel Analysis of Team Performance (Unstandardized Estimates)

Predictors	Estimate	S.E.	Est./S.E.	95% CI
Individual resilience (Level 1)	0.14**	0.05	2.95**	0.05–0.23
Team resilience (Level 1)	0.74***	0.07	10.38***	0.57–0.87
Team resilience (Level 2)	1.04**	0.39	2.67**	0.04–1.80

Est., Estimate; Level 1, Individual, Within groups; Level 2, Team, Between groups; S.E., standard error.

**P ≤ 0.01.

***P ≤ 0.001.

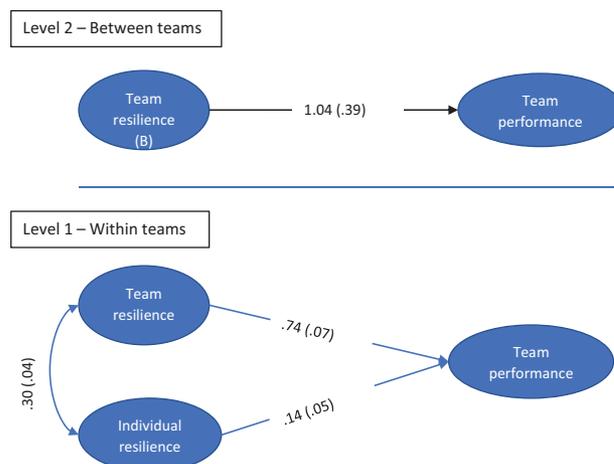


FIGURE 2. Two-level model depicting observed relationships of team and individual resilience to team performance. Note. Model fit: $\chi^2(9) = 18.56$, CFI = 0.99, TLI = 0.99, RMSEA = 0.06, SRMR (within) = 0.01, SRMR (between) = 0.08. All paths are significant at $P < 0.05$.

were taken into account. This suggests that personal resilience behaviors may have a more proximal effect on exhaustion (eg, via their effects on recovery),¹ while the effect of team resilience, on the contrary, may be more distal, and perhaps mediated by individual resilience. In other words, team resilience may be indirectly related to exhaustion through its effect of encouraging individual resilience. Longitudinal research would permit investigation of this possibility.

One notable additional finding of our research was the strong relationship of the dimension “Finding Your Calling” not only with individual resilience as anticipated but also with team resilience and engagement. The items of this dimension capture respondents’ sense of one’s work, and workplace, fulfilling a sense of purpose and providing a sense of belonging. That this dimension shared variance with all three constructs suggests that its constituent items may have tapped into participants’ felt perceptions of the quality of their existing job and their work-related social (team) environment as much as it captured their dedicated efforts to ensure alignment between their current job and their work-related aspirations and goals.⁸⁴ Further, there may be a reciprocal relationship, such that positive affective states engendered by experiences of work engagement may foster constructive, effortful attempts to develop personal resilience and vice versa. Such a relationship warrants further examination in future research.

Study Limitations and Suggestions for Future Research

One limitation of the present study was its cross-sectional design, which prevented firm conclusions about causation being drawn. A longitudinal study, with three or more waves, would allow the effects of individual and team resilience over time to be identified, as well as the modeling of causal, reversed-causal, and reciprocal effects.⁸⁵ For example, successful team performance might bolster team resilience, which could further boost performance. There might also be reciprocal effects between individual resilience and work engagement, with high engagement boosting energy levels and therefore the capacity to commit to investing in personal resilience strategies.⁸⁵ A multi-wave study could also help identify reciprocal influences between individual and team resilience, as well as possible mediation pathways.

A second limitation concerns the relatively modest sample size and number of teams, which, although adequate for the present purpose, somewhat curtailed the scope of the analyses and inferences that could be drawn. A larger sample would ensure greater confidence in the stability of factor estimates,⁸⁶ while greater numbers of individuals and teams, nested within organizations, would permit full multilevel SEM (ie, with latent variables and indicators), and would also enable exploration of possible antecedents, as well as the putative outcomes of team resilience. Possible candidates in this regard include empowering and/or transformational leadership,⁸⁷ supervisor support, and sufficient job flexibility.⁸⁸

Several other avenues of future research are possible. From a theoretical perspective, it is likely, as hinted earlier, that although comprehensive, the R@W Team scale does not capture every aspect of resilience—antecedents, behaviors, consequences—equally. Specifically, it does not capture actual instances of “bouncing back” or of having adapted to change in a strengthened state. Future research could investigate the extent to which the team (and individual) R@W scales measure adaptation to specific incidents and challenges (eg, changes in job or role, organizational change), with a view to capturing the underlying mechanisms involved, and building a theoretical model.

There is also the scope to explore the relationship between team resilience and related organizational constructs such as psychological capital, psychosocial safety climate, and organizational citizenship behavior (OCB). For example, how are team-based behaviors fostered by PSC and how does team resilience correlate with the individual measures comprising psychological capital or engagement in OCBs?

For practitioners, the R@W Team Scale provides a useful diagnostic tool with high face validity that can be used to measure and develop resilience within work teams at all organizational levels. It compliments, yet builds on the R@W Scale, allowing assessment and development of the resilience of both team members individually and the team collectively. Together, these scales provide the systemic approach that is often missing in workplace resilience interventions. Most focus only on individual employee resilience and do not consider organizational context.

The R@W Team Scale can be used to assess the effectiveness of team-based or organization-wide interventions, or as an instrument for use in team coaching or development activities. Assessment on the scale directly informs team strengths and development areas, as it comprises practical actions that can be taken to build on the former and address the latter. The scale is also useful in leadership development, as it provides actions that a leader can foster within the teams they lead to promote sustainable performance. Importantly, the measure is positively associated with engagement and team performance indicating that resilience, as defined and measured here, contributes to organizational performance. Often resilience is considered as an employee well-being initiative rather than a core business strategy.

As the team R@W measure is intended for practical application, its utility as a tool to assess intervention effectiveness should be investigated. Given the predominant focus within organizations on individuals, further research could explore the differing impact on performance and well-being of resilience interventions at the individual, team, or both levels. There is also scope to compare the different outcomes from team development using traditional team effectiveness measures⁸⁹ and the R@W Team Scale.

Finally, both R@W Scales can be used in the emerging area of organizational resilience in which cyber security, business continuity, disaster management, and risk management professionals work together to ensure an organization's capacity to absorb and adapt in a challenging environment. Although employee resilience is acknowledged as a critical factor in this area, there is limited inter-

relationship between the professional domains. Together, the two R@W Scales provide an assessment of resilience of human capital that complements assessment of infrastructure and other factors that promote organizational resilience. There is scope to explore this inter-connection.

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