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## Systems-informed PERMA+4 and psychological safety: Predicting work-related well-being and performance across an international sample

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#### **ABSTRACT**

Although past reviews have documented the associations between PERMA+4 and psychological safety on work performance, few studies have examined the interaction of each construct on work outcomes using a systems-informed approach. This study examined the predictive validity of employee and team PERMA+4 and psychological safety on employee and team work-related outcomes. Full-time employees were recruited to take an online survey assessing their work-related well-being and performance (N=1,200). At the employee level, PERMA+4 and psychological safety significantly predicted job-related affective positive well-being (b=0.04, 95%CI=0.02, 0.07, p < .05) and job stress (b=-0.03, 95%CI=-0.05, -0.01, p < .05). At the team level, PERMA+4 and psychological safety significantly predicted team proficiency (b=0.03, 95%CI=0.01, 0.05, p < .05), team adaptivity (b=0.05, 95%CI=0.02, 0.08, p < .05), and team proactivity (b=0.05, 95%CI=0.01, 0.09, p < .05). Scholars and practitioners may consider using a systems-informed approach with PERMA+4 and psychological safety to measure and evaluate workplace well-being programs and interventions.

#### **ARTICLE HISTORY**

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#### KEYWORDS

PERMA+4; psychological safety; systems sciences; workplace; performance; positive psychology; systems-informed positive psychology

#### Introduction

Workplaces have witnessed unprecedented changes in the wake of COVID-19. People have started and lost jobs, burnout levels across occupations are high, workplaces have adopted hybrid ways of working, and employees are increasingly prioritizing their health and well-being, calling for leaders and organizational policies to facilitate employee flourishing (Winiarski, 2023). The demand for positive work environments and cultures has created a new wave of research and innovation for an evidencebased, data-driven field that utilizes technological advancements and human-centered design to understand optimal psychological functioning, well-being, and performance in the workplace (van Zyl et al., 2023). The science of positive psychology at work, defined hereafter as Positive Work and Organizations (PWO), examines how the well-being of employees, teams, and leaders impacts work performance (Donaldson, 2019; Donaldson et al., 2020).

Expanding on Seligman's original PERMA (positive emotion, engagement, relationships, meaning, and accomplishment) model (Seligman, 2011), a PWO framework of wellbeing, with four additional building blocks of

well-being (i.e. PERMA+4, adding physical health, mindset, environment, and economic security to the PERMA framework) was developed to measure work-related positive functioning and performance (Donaldson et al., 2022). Psychometrically valid measures of PERMA+4 have been tested and shown to be predictive of positive functioning at work (Cabrera & Donaldson, 2023; Donaldson et al., 2023). However, few studies in PWO have gone beyond the individual, employee level of measurement to understand the association between wellbeing and performance. In other words, the influence of the workplace system, including leaders and work teams, on well-being and performance is understudied. Systemsinformed positive psychology has been proposed to examine the dynamic interrelationships of individuals in their social and environmental systems (Kern et al., 2020). For example, leaders who cultivate psychological safety within work environments may enable employees to harness their strengths, openly learn from one another, and be more productive, without fear of rejection, incompetence, or judgment (Edmondson, 1999; Newman et al., 2017; Nishii, 2013). Past research has shown that leaders can shape perceptions of psychological safety among



employees and work teams, which has been linked to increased work engagement (Edmondson, 1999; Kahn,

To our knowledge, only one study has examined the association between employee PERMA+4 and psychological safety (Lorenz et al., 2023). Further, the association between PERMA+4 and psychological safety on work performance at the team level is unknown. To address these knowledge gaps, this study examined the predictive validity of employee and team PERMA+4 and leader psychological safety on employee and team workrelated outcomes, including job stress, job-related affective well-being, and work role performance. The following hypotheses were tested:

#### **Employee**

- 1a. Employee PERMA+4 significantly predicts job stress and job-related affective well-being.
- 2a. Employee psychological safety significantly predicts job stress and job-related well-being.
- 3a. The interaction of employee PERMA+4 and employee psychological safety predicts job stress and job-related well-being.

#### Team

- 1b. Team PERMA+4 significantly predicts work role performance.
- 2b. Team psychological safety significantly predicts work role performance.
- 3b. The interaction of team PERMA+4 and team psychological safety predicts work role performance.

#### **Methods**

#### **Procedure and participants**

Participants were recruited using an online panel agency, which collected a representative sample of fulltime employees based on sociodemographic characteristics, to obtain a broad range of employees working across a variety of industries. Participants were provided with a link and then were directed to an online survey. To be eligible to participate in this study, participants were required to be full-time employees and work on a team of two or more individuals. After providing informed consent, participants completed survey items assessing their PERMA+4 and levels of work-related wellbeing and performance. The survey concluded with several sociodemographic questions. Participants were paid \$3.00 for completing the survey. The Claremont Graduate University Institutional Review Board approved all research materials and procedures.

The final sample consisted of N = 1,200 participants from 54 nationalities (see Supplementary Table S1 for the full list of nationalities). Supplementary Table S2 provides participants' sociodemographic characteristics.

#### **Explanatory** measures

#### PERMA+4

Based on past research (Donaldson et al., 2023), this study used a nine-item measure to assess the employee level of PERMA+4 (employee). For each item, participants were asked to consider how well they have functioned at work over the past two weeks. They were then instructed to indicate the extent to which they agreed with a statement that represented each of the nine building blocks that represent PERMA+4, ranging from 1 = strongly disagree to 7 = strongly agree. Example items included 'I was deeply engaged in my work' and 'I was supportive of others'. An additional 9-item measure of PERMA+4 was adapted from PERMA+4 (employee) and developed at the team (PERMA +4 (team)) level, with questions from the PERMA+4 adjusted to ask about team wellbeing, rather than individual wellbeing. Example items included 'My team was a positive group to work with', and 'My team was engaging to work with'. The internal consistencies for PERMA+4 (employee) and PERMA+4 (team) were considered excellent ( $\alpha$ =.90 and  $\alpha$ =.89, respectively).

#### Psychological safety

Using prior research (Edmondson, 1999), the role of leadership behavior on the psychological safety of employees (psychological safety (employee)) and teams (psychological safety (team)) was assessed. Participants were asked to take a moment and consider how they have felt at work over the past two weeks. They were then instructed to indicate the extent to which they agreed with five statements representing their leaders' influence on their individual and team's psychological safety. Response options ranged from 1=strongly disagree to 7=strongly agree. Example items included 'My leader made it safe for me to talk honestly and bring up problems' and 'My leader used team rituals (i.e. informal gatherings) to create opportunities for our team to build trust with each other'. The internal consistencies for leader psychological safety (employee) and leader psychological safety (team) were excellent ( $\alpha$ =.89 and  $\alpha$ =.93, respectively).



#### **Outcome measures**

#### Job-related affective well-being scale

The 20-item short version of the job-related affective well-being scale (JAWS) was used in this study (Van Katwyk et al., 2000). The 20-item JAWS scale includes 10 items for the positive and negative subdimensions: 1) positive job-related affective well-being consists of high pleasurable-high arousal emotions (HPHA; e.g. energetic, excited) and high pleasurable-low arousal emotions (HPLA; e.g. at-ease, calm), and 2) negative jobrelated affective well-being consists of low pleasurablehigh arousal emotions (LPHA; e.g. angry, anxious), and low pleasurable-low arousal (LPLA; e.g. bored, depressed) emotions. Past research has supported the validity of the JAWS scale across various employee populations (Van Katwyk et al., 2000). Responses were measured on a 5-point Likert-type scale from 1 = never to 5 = extremely often. Example items included 'My job made me feel angry', and 'My job made me feel fatigued'. The internal consistencies for JAWS positive and JAWS negative were excellent ( $\alpha = .93$  and  $\alpha = .91$ , respectively).

#### Job stress

Past research was used to include a five-item measure of job stress, with response options ranging from 1=strongly disagree to 5 = strongly agree (Lambert et al., 2006). Example items included 'A lot of time my job makes me very frustrated or angry', and 'When I'm at work I often feel tense or uptight'. Research has supported the internal consistency and factor analytic structure of the job stress scale ( $\alpha = .87$ ) (Lambert et al., 2006).

#### Work role performance

A multidimensional measure of team, work role performance was used to measure adaptivity, proficiency, and proactivity (Griffin et al., 2007). Past research has supported a nine-factor structure of work role performance using three items on each subscale, with response options ranging from 1 = strongly disagree to 7 = strongly agree (Griffin et al., 2007). Example items included 'I respond constructively to changes in the way my team works' and 'I improve the way my work unit does things'. The internal consistencies for team proficiency, team adaptivity, and team proactivity were acceptable ( $\alpha$ =.79,  $\alpha$ =.83, and  $\alpha$ =.91, respectively).

#### **Analytic strategy**

All analyses were conducted in the R statistical program using the psych and stats packages (R Core Team, 2021; Revelle, 2017). Descriptive statistics were computed, including means, standard deviations, internal consistencies, skewness, and kurtosis. Research has suggested that normal skewness values range from -2 to +2 and kurtosis values from -7 to +7 (Byrne, 2010). To examine internal consistencies, Cronbach's alpha was used. All statistically significant results were reported at p < .05(Cronbach, 1951). Linear regression analyses were used to examine the relationship between PERMA+4, psychological safety, and work outcomes. All statistically significant results and  $R^2$  values were reported at p < .05.

#### Results

Table 1 shows the descriptive statistics for the PERMA+4, psychological safety, and work outcome measures. All observed variables had acceptable Cronbach's alpha values and skewness and kurtosis values within the normal range.

Table 2 shows the predictive validity of PERMA+4 (employee) and psychological safety (employee) on work outcomes. PERMA+4 (employee) was significantly predictive of JAWS positive (b = 0.23, 95%CI = 0.15, 1.47,p < .05), JAWS negative (b=-0.46, 95%Cl=-0.55, -0.37, p <.05), and job stress (b=-0.24, 95%Cl =-0.35, -0.14, p < .05). Psychological safety (employee) was predictive of JAWS negative (b=-0.18, 95%Cl=-0.29, -0.07, p < .05). No significant relationships were observed between psychological safety (employee), JAWS positive, and job

Table 1. Means, standard deviations, internal consistencies, skewness, and kurtosis of PERMA +4, psychological safety, and work outcome measures.

Explanatory Measure	M (SD)	а	Skewness	Kurtosis
PERMA +4 (employee)	5.04 (1.13)	.90	-0.70	0.14
PERMA +4 (team)	5.27 (0.09)	.89	-0.85	0.01
Psychological safety (employee)	4.35 (1.43)	.89	0.01	-0.45
Psychological safety (team)	4.26 (1.51)	.93	0.01	0.01
Outcome Measure				
JAWS Positive	2.97 (0.86)	.93	-0.12	-0.45
JAWS Negative	2.33 (0.83)	.91	0.63	-0.03
Job Stress	2.71 (0.92)	.87	0.29	-0.53
Team Proficiency	5.92 (0.89)	.79	-1.26	2.18
Team Adaptivity	5.51 (1.00)	.83	-1.06	1.82
Team Proactivity	5.08 (1.29)	.91	-0.86	0.45

N = 1,200; JAWS = job-related affective well-being.



Table 2. Predictive validity of PERMA+4 (employee) and psychological safety (employee) on work outcomes.

	JAWS Positive		JAWS Negative		Job Stress	
Variable	В	95% CI	В	95% CI	В	95% CI
PERMA +4 (employee)	0.23	[0.15, 1.47]	-0.46	[-0.55, -0.37]	-0.24	[-0.35, -0.14]
Psychological safety (employee)	-0.03	[-0.13, 0.07]	-0.18	[-0.29, -0.08]	0.01	[-0.11, 0.14]
PERMA +4 (employee): Psychological safety (employee)	0.04	[0.02, 0.07]	0.02	[0.00, 0.04]	-0.03	[-0.05, -0.01]
$R^2$	0.48		0.41		0.33	

N = 1,200; statistically significant model coefficients and model change statistics are bolded (p < .05); JAWS = job-related affective wellbeing; R<sup>2</sup>=amount of variance explained.

Table 3. Predictive validity of PERMA+4 (team) and psychological safety (team) on work outcomes.

	Team Proficiency		Team Adaptivity		Team Proactivity	
Variable	В	95% CI	В	95% CI	В	95% CI
PERMA +4 (team)	0.30	[0.19, 0.42]	0.27	[0.15, 0.39]	0.20	[0.03, 0.37]
Psychological safety (team)	-0.11	[-0.26, 0.03]	-0.23	[-0.39, 0.00]	-0.15	[-0.37, 0.07]
PERMA +4 (team): Psychological safety (team)	0.03	[0.01, 0.05]	0.05	[0.02, 0.08]	0.05	[0.01, 0.09]
$R^2$	0.23		0.25		0.16	

N = 1,200; Statistically significant model coefficients and model change statistics are bolded (p < .05);  $R^2 =$  amount of variance explained.

stress. The interaction of PERMA+4 (employee) and psychological safety (employee) had a significant effect on JAWS positive (b = 0.04, 95%CI = 0.02, 0.07, p < .05) and job stress (b=-0.03, 95%C/=-0.05, -0.01, p<.05). The interaction model explained 48% and 33% of the variance in each outcome measure, respectively.

Table 3 shows the predictive validity of PERMA+4 (team) and psychological safety (team) on work outcomes. PERMA+4 (team) was significantly predictive of team proficiency (b = 0.30, 95%CI = 0.19, 0.42, p < .05), team adaptivity (b = 0.27, 95%CI = 0.15, 0.39, p < .05), and team proactivity (b = 0.20, 95%CI = 0.03, 0.37, p<.05). No significant relationships were observed between psychological safety (team) and work role performance. The interaction of PERMA+4 (team) and psychological safety (team) had a significant effect on team proficiency (b = 0.03, 95%CI = 0.01, 0.05, p < .05), team adaptivity (b = 0.05, 95%CI = 0.02, 0.08, p < .05), and team proactivity (b = 0.05, 95%CI = 0.01, 0.09, p < .05). The interaction model explained 23%, 25%, and 16% of the variance in each outcome measure, respectively.

#### **Discussion**

This study found that the interaction of PERMA+4 and psychological safety can predict work-related well-being and performance at the individual and team levels. The results suggest that approaches that develop PERMA+4 and psychological safety might be useful, although the extent to which PERMA+4 and psychological safety can be trained is beyond the scope of this study.

Consistent with past research (Donaldson & Donaldson, 2021a, 2021b), PERMA+4 (employee) significantly predicted job-related positive and negative affective well-being and job stress, supporting Hypothesis 1a. While past research has suggested that psychological safety was predictive of work performance at the individual level (Bienefeld & Grote, 2014; Carmeli et al., 2010; Palanski & Vogelgesang, 2011), this study showed that psychological safety was significantly predictive of job-related negative affective wellbeing but not job-related positive affective well-being or job stress. These findings partially supported *Hypothesis 2a*. The interaction of PERMA+4 (employee) and psychological safety (employee) significantly predicted job stress and jobrelated well-being at the individual level, supporting Hypothesis 3a.

This study showed that PERMA+4 (team) was predictive of team proficiency, adaptivity, and proactivity. This is comparable to past research that has shown that PERMA+4 was associated with work role performance (Cabrera & Donaldson, 2023). However, this is the first study to show that a measure of PERMA+4 at the team level was also predictive of work outcomes, providing support for Hypothesis 1b. While past research has documented the association between psychological safety and work performance (Martins et al., 2013), this study found no significant associations, providing no support for Hypothesis 1b. The interaction of PERMA+4 (team) and psychological safety (team) significantly predicted team proficiency, adaptivity, and proactivity, providing support for Hypothesis 3b.

Past systematic reviews of PERMA+4 and psychological safety have independently documented associations with work-related well-being and performance (Cabrera & Donaldson, 2023; Newman et al., 2017). This study builds on past research by showing the additive effect



of two robust workplace psychological theories on workrelated well-being and performance at the individual and team levels (i.e. PERMA+4 and psychological safety). These findings suggest that workplace programs and interventions may consider using these concepts in tandem to drive employee and team positive optimal functioning. However, future research is needed to test the causal effects of PERMA+4 and psychological safety on work outcomes. Further, studies might examine psychological safety as a moderator on different relationships between PERMA+4 and work outcomes at the individual and team levels.

#### Limitations

The data were collected using a cross-sectional, selfreport survey design and may suffer from self-report and social desirability bias (Donaldson & Grant-Vallone, 2002). This study did not use a nesting variable to measure variables at the team level, precluding the research team from computing team-level scores. In other words, employees self-reported their team-level well-being and performance, which may have biased the team scores. Data were collected from a research panel over 24 hours, providing a snapshot of the relationships between the observed variables. Longitudinal data is needed to test the associations of PERMA+4, psychological safety, and work outcomes at multiple time points.

#### **Conclusion**

This study showed that the interaction of PERMA+4 and psychological safety was predictive of work-related wellbeing and performance at the employee and team levels. These findings expand on past research by showing that a systems-level analysis may be useful to measure work-related well-being and performance and inform the design and evaluation of future workplace programs and interventions that enhance well-being.

#### **Disclosure statement**

No potential conflict of interest was reported by the author(s).

#### **Data availability statement**

All data have been made publicly available at the [https:// github.com/SDonaldsonRutgers/PERMA4\_PsychSafety] and can be accessed at [https://github.com/SDonaldsonRutgers/ PERMA4\_PsychSafety/blob/main/PERMA4\_PsychSafety.Rmd].

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