

VALIDATION OF THE ITALIAN VERSION OF THE MINDFULNESS ORGANIZING SCALE (MOS) IN ORGANIZATIONAL CONTEXTS

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The aim of this study is to investigate the psychometric properties of the Italian version of the nine-item Mindfulness Organizing Scale (MOS) in a sample of 654 Italian employees (330 males and 324 females, age range 25-64 years). A confirmatory factor analysis and a reliability analysis were carried out. The results supported the one-dimensional factor structure of the MOS, and the utility of excluding one item to increase the reliability. The validity of the eight-item scale was confirmed by significant correlation with the Perceived Organizational Support Scale, Commitment to Organizational Change, and other scales that evaluate the antecedents and some single dimensions of organizational mindfulness: awareness of potential problems, tendency towards carelessness, complexity of the organization, preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise (Weick & Sutcliffe, 2001). The good psychometric properties of the scale allow for the revised scale to be used in research and assessment.

Key words: Mindfulness; MOS; High-reliability organizations; Safety; Validation.

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Organizational mindfulness has its origins in the work of psychologists who developed the notion of individual mindfulness as a state of alertness and active awareness that is characterized by the creation and refinement of categories, openness to new information, and awareness of multiple perspectives (Langer, 1989; Ryle, 1949; Sternberg, 2000). Many positive benefits can be associated with mindfulness, such as health improvement, stress reduction, increased creativity, and less risk of burnout (Alexander, Langer, Newman, Chandler, & Davies, 1989; Langer, Beck, Janoff-Bulman, & Timko, 1984; Langer, Heffernan, & Kiester, 1988). As Ray, Baker, and Plowman (2011) highlighted, more recently, the notion of organizational mindfulness has emerged in the organizational science literature with regard to automatic and non-automatic information pro-

cessing (Levinthal & Rerup, 2006; Sandelands & Stablein, 1987) and in studies of high-reliability organizations (Weick & Roberts, 1993; Weick & Sutcliffe, 2001).

In recent years, empirical research has investigated mindfulness from a workplace perspective (Dane & Brummel, 2013). Furthermore, several studies have convincingly argued that mindfulness affects organizational outcomes, for example safety climates (Weick, Sutcliffe, & Obstfeld, 1999), organizational attention (Weick & Sutcliffe, 2006), security (Butler & Gray, 2006), creativity (Runco, 2007; Runco & Albert, 1990), innovation and learning (Levinthal & Rerup, 2006), as well as adaptation and performance (Rerup, 2005; Senge, Scharmer, Jaworski, & Flowers, 2005; Weick & Sutcliffe, 2007). Mindfulness would seem to be a positive characteristic that enables individuals to respond to their external environments more effectively and it should be particularly relevant to the understanding and goal-setting that occurs in organizations (Weick & Sutcliffe, 2001).

FROM INDIVIDUAL TO ORGANIZATIONAL MINDFULNESS

In refining the focus of the literature on organizational mindfulness, we should revisit its foundational research and theory on individual mindfulness. The research examining individual mindfulness suggests two approaches: Western and Eastern perspectives.

The first one derives from Langer's (1989) work. A Western perspective means that mindfulness is a variant of an information-processing approach (Weick & Sutcliffe, 2006). According to Langer, mindfulness is expressed through the active differentiation and refinement of existing categories and distinctions; it means the creation of discontinuous new categories out of streams of events, and a more nuanced appreciation of contexts and alternative ways to work within them. Brown and Ryan (2003), working within a Western tradition, defined mindfulness "as enhanced attention to and awareness of current experience or present reality. . . . [A] core characteristic of mindfulness has been described as open or receptive awareness and attention [,] . . . which may be reflected in a more regular or sustained consciousness of ongoing events and experiences" (pp. 822-823).

The Eastern perspective on mindfulness has its foundations in Buddhist thought (Hede, 2010). In this approach, mindfulness is a receptive attention to and awareness of present events and experiences occurring both internally and externally (Brown & Ryan, 2003) or through non-reactive and non-judgmental moment-to-moment awareness (Weick & Putnam, 2006). Regardless of perspective, studies of individual mindfulness show that mindfulness curtails negative functioning and enhances positive outcomes in several important life domains such as mental and physical health, behavioral regulation, and interpersonal relationships (Brown, Ryan, & Creswell, 2007; Hede, 2010; Langer, 2009).

Weick et al. (1999) founded their conception of organizational mindfulness on Langer's (1989) Western perspective. The idea is that, in creating new categories to make sense of experience and develop a more nuanced appreciation of contexts and ways to interact with it (Langer, 1989), active differentiation and refinement result from a preoccupation with failure, a reluctance to simplify interpretations, a sensitivity to operations, a commitment to resilience, and deference to expertise. More recent theoretical work on organizational mindfulness has begun to link it to Eastern mindfulness (Weick & Putnam, 2006; Weick & Sutcliffe, 2006).

The research examining organizational mindfulness suggests that it has important effects on concentration and strength of insight. Weick and Putnam (2006) provide interesting connections for each component of organizational mindfulness. According to Ray and colleagues (2011), organizational mindfulness works to create a context by signaling what the organization expects, rewards, commits, and supports (Zohar, 1980).

In their review of the numerous case studies on high-reliability organizations (HROs), Weick and Sutcliffe (2001, 2007) stated that HROs derive their ability to successfully manage complex, dynamic, and error-intolerant conditions from organizational mindfulness. They define organizational mindfulness as the extent to which an organization captures discriminative details about emerging threats and swiftly creates the capability to act in response to these details. According to Vogus and Sutcliffe (2012),

(. . .) organizational mindfulness specifically consists of regularly and robustly discussing potential threats to reliability (preoccupation with failure); developing a nuanced and current understanding of the context by frequently questioning the adequacy of existing assumptions and considering reliable alternatives (reluctance to simplify interpretations); integrating these understandings into an up-to-date big picture (sensitivity to operations); recognizing the inevitability of setbacks and thoroughly analyzing, coping with, and learning from them (commitment to resilience); and deferring to expertise rather than authority when making important decisions. (p. 723)

Some authors have underlined the differences between individual and organizational mindfulness, with the latter being a characteristic of an organization as a whole. Ray and colleagues' (2011) work helps to clarify that organizational mindfulness is not an intrapsychic process; it is an organizational attribute, relatively stable and enduring, that results from structures and practices implemented by top management. From another point of view (Vogus & Sutcliffe, 2007; Weick & Sutcliffe, 2007), organizational mindfulness is characterized as mindful organizing. It is a social process that becomes collective through the actions of and interactions among individuals (Morgeson & Hofmann, 1999). As Weick and Putnam (2006) underlined, the organizational literature has related mindfulness to some positive organizational conditions; for example, it improves coordination (Weick & Roberts, 1993), reduces the likelihood and severity of organizational accidents (Weick et al., 1999), aids information system design (Swanson & Ramiller, 2004), produces creative solutions (Langer, 2005), heightens adaptation (Vogus & Welbourne, 2003), fosters entrepreneurship (Rerup, 2005), and reduces stress (Davidson et al., 2003). Mindfulness is central to better performance, but there is also a necessity to practice it in everyday life in order to become skilful at managing attention before a severely stressful event occurs. Vogus & Sutcliffe (2012) underlined that organizational mindfulness is associated with innovation (Vogus & Welbourne, 2003), and both the conceptual and empirical literatures have mostly posited and found that organizational mindfulness has a positive linear relationship with organizational outcomes.

Moreover, the literature tries to depict the most important characteristics that organizations could improve to emulate HROs, including both the formal structures and the informal practices that complement those structures (Carroll & Rudolph, 2006). In their meta-analysis, Tolk, Cantu, and Beruvides (2015) show that many investigators link HRO theory to mainstream organizational behavior and organizational psychology theory.

But organizational mindfulness is strictly linked with individual variables, and has rele-

vant consequences on them. Many cognitive variables are useful for high-reliability projects to demonstrate the safety of employee performance in operating environments (Saunders, 2015): organizational culture, clarity of organizational objectives, a culture of trust (which is the basis of organizational support), openness and accountability (Reason, 1997), conceptual slack (so that different perspectives are tolerated and differing interpretations maintained: Boin & Schulman, 2008), commitment, and implementation of change (Bannerman, Reich, Sauer, & Liu, 2013). In particular, mindful organizing acts on the commitment to openness (Rerup, 2009) and provides a great deal of social support and resources that improve the experience of work and enhance performance.

There may also be a reciprocal relationship between affective commitment (Meyer, Allen, & Smith, 1993) to an organization and mindful organizing over time. Mindful organizing may also generate in the workers a commitment profile — for example, simultaneous high levels of affective and normative commitment — that in turn drives behaviors typical of HROs (Gellatly, Meyer, & Luchak, 2006; Wasti, 2005). Therefore, the effects of mindful organizing on multiple forms of commitment to an organization might also further reinforce and deepen the processes of mindful organizing over time. Hofmann and Morgeson (1999) demonstrated that perceived organizational support can be considered a predictor of safety-related communication and commitment. Finally, mindful organizing may develop both organizational resources (e.g., conditions for job engagement) and individual attitudes (e.g., perceived support and commitment to change) (Zivnuska, Kacmar, Ferguson, & Carlson, 2016).

MEASUREMENT OF ORGANIZATIONAL MINDFULNESS

Although the construct of mindfulness can be considered relevant in organizational studies, only few instruments have been developed to measure it. Using Weick and Sutcliffe's conceptual framework of mindfulness, Hoy, Gage, and Tarter (2004) developed the School Mindfulness Scale (M-Scale) based on five properties: a focus on mistakes, a reluctance to simplify, a sensitivity to teaching and learning, a commitment to resilience, and a deference to expertise in problem solving. The M-Scale is a 20-item Likert-type scale. Teachers are asked to respond to each item (i.e., descriptions of behaviors) according to a 6-point scale from 1 (*strongly disagree*) to 6 (*strongly agree*). The validation study presents the good reliability of the measure (Cronbach's $\alpha > .90$ for each subscale).

Ray et al. (2011) examined organizational mindfulness in U.S. business schools, considering its impact on how decision-makers view organizational mindfulness. They developed and validated a five-factor measure of organizational mindfulness, adapted from Weick and Sutcliffe's (2001) 47-item questionnaire. The scale is a 43-item questionnaire with a 5-point Likert-type scale from 1 (*extremely inaccurate*) to 5 (*extremely accurate*) to indicate how well each statement described an organization. The validation study reports good reliability (α from .64 to .89 for the five subscales).

Weick and Sutcliffe (2007) proposed eight short scales to investigate some aspects of organizational mindfulness in HROs. Three of them evaluate the antecedents of mindfulness:

Awareness of potential problems. In fact, "the more people in an organization are concerned about the mis-identification, mis-specification, and mis-understanding of things, the higher reliability that organization can hope to achieve" (Schulman, 2004, p. 39).

Tendency toward carelessness is characterized by a stereotyped way of thinking, treating new problems and situations as though they were usual.

Complexity of the organization. In systems with high levels of complexity and interactivity, a problem cannot be restricted to a single step or part; rather, all of the processes are involved.

The other five scales evaluate the dimensions of organizational mindfulness according to the authors' conceptual framework:

Preoccupation with failure is the ability to identify small mistakes before they become major problems.

Reluctance to simplify promotes an understanding of the subtleties of a given situation.

Sensitivity to operations means staying close to the core function of the organization; in mindful organizations, surprises are not unexpected, because they can be anticipated.

Commitment to resilience is the capacity not only to identify mistakes early, but also to bounce back and overcome them; no amount of anticipation is going to prevent mistakes, so resilience is critical.

Deference to expertise refers to the possibility of matching expertise with the problems, regardless of rank and status, and using knowledge for an effective decision-making process (Hoy, Gage, & Tarter, 2006).

Lastly, Vogus and Sutcliffe (2007, 2012) constructed and validated the Mindfulness (formerly Safety) Organizing Scale (MOS). The nine items that were developed are closely linked to the theoretical literature on HROs, which identifies collective mindfulness as reflected by the following five processes: preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and deference to expertise (Weick, Sutcliffe, 2001; Wilson, Burke, Priest, & Salas, 2005). Each of these processes is defined and linked to corresponding survey items in Table 1. This scale derives from the previous scales proposed by Weick and Sutcliffe (2007) and described above, and represents a synthesis of these scales. Considering the lack of Italian scales for evaluating organizational mindfulness, we have chosen to adapt this scale for a sample of Italian workers for several reasons: it is easy to apply in organizational studies, simple to understand, and very brief, maintaining (according to the authors) very good psychometric properties.

AIM OF THE STUDY

The aim of the study is the validation of the MOS in the Italian context, verifying its reliability, structure, and concurrent validity. We used Weick and Sutcliffe's (2007) version of the scale, which was developed to facilitate the action-research process in organizations. Differently from the original Safety Organizing Scale, which used a 7-point Likert scale (Vogus & Sutcliffe, 2007), the authors use a 3-point Likert scale instead. Previous studies in the Italian context have already used this form of the scale (Golzio, Lalla, & Manni, 2014). The 3-point format aims to be easier to understand for the respondents and similar to the format of Weick and Sutcliffe's (2007) other scales (used also in our validation study) to be administered in the same session. Moreover, as reported in Jacoby and Matell's (1971, p. 498) study, and confirmed by Lehmann and Hulbert (1972), "the evidence indicates that both reliability and validity are independent of the number of

scale points used for Likert-type items,” underlining that the results of their study could be used to justify the choice of trichotomous Likert-type scale items.

TABLE 1
Correspondence between MOS items and processes of collective mindfulness (Vogus & Sutcliffe, 2007)

Dimension	Definition	Mindfulness Organizing Scale items	Mindfulness Organizing Scale items in Italian translation
Preoccupation with failure	Operating with a chronic wariness of the possibility of unexpected events that may jeopardise safety by engaging in proactive and pre-emptive analysis and discussion	When discussing emerging problems with co-workers, we usually discuss what to look out for (5) We spend time identifying activities we do not want to go wrong (7)	Nel parlare con i colleghi dei problemi che si presentano, abitualmente discutiamo di cosa è importante non perdere di vista (5) Dedichiamo del tempo a identificare le attività che non vogliamo vadano storte (7)
Reluctance to simplify interpretations	Taking deliberate steps to question assumptions and received wisdom to create a more complete and nuanced picture of ongoing operations	We discuss alternatives as to how to go about our normal work activities (4)	Parliamo insieme delle alternative rispetto a come svolgere le nostre normali attività lavorative (4)
Sensitivity to operations	Ongoing interaction and information-sharing about the human and organizational factors that determine the safety of a system as a whole	We have a good “map” of each person’s talents and skills (1) We discuss our unique skills with each other so that we know who has relevant specialized skills and knowledge (3)	Nella nostra azienda abbiamo una buona “mappa” dei talenti e delle abilità di ciascuno (1) Parliamo delle nostre reciproche competenze specifiche, così da sapere chi ha competenze e competenze altamente specializzate (3)
Commitment to resilience	Developing capabilities to detect, contain, and bounce back from errors that have already occurred, but before they worsen and cause more serious harm	We talk about mistakes and ways to learn from them (2) When errors happen, we discuss how we could have prevented them (8)	Parliamo degli errori e dei modi di imparare da essi (2) Quando avvengono degli errori, discutiamo di come avremmo potuto prevenirli (8)
Deference to expertise	During hightimes (i.e., when attempting to resolve a problem or crisis), decision-making authority migrates to the person or people with the most expertise to solve the problem at hand, regardless of their rank	When attempting to solve a problem, we take advantage of the unique skills of our colleagues (6) When a crisis occurs, we rapidly pool our collective expertise to attempt to resolve it (9)	Nel cercare di risolvere un problema, traiamo profitto dalle specifiche competenze dei nostri colleghi (6) Quando si presenta una crisi, mettiamo rapidamente in comune la nostra competenza collettiva per cercare di risolverla (9)

Note. In brackets, the corresponding number of the item in the scale.

METHOD

Participants and Procedure

The participants were 654 Italian workers (male = 330, 50.46%; female = 324, 49.54%), aged between 25 and 64 years. The participants were recruited on a voluntary basis from public administration (378, 57.80%), public health institutions (90, 13.76%), and private organizations (186, 28.44%).

Table 2 represents the sample distribution for gender and age. The sample was collected from 13 different Italian regions (north = 102, 15.60%; centre = 68, 10.40%; south = 484, 74.00%).

TABLE 2
Sample distribution for gender and age

	25-40 years		41-55 years		56-64 years		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Male	134	20.49	130	19.88	66	10.09	330	50.46
Female	128	19.57	151	23.09	45	6.88	324	49.54
Total	262	40.06	281	42.97	111	16.97	654	100.00

Participation in the study was completely voluntary, the data were collected anonymously, and the participants could refuse to participate further at any moment. The survey was approved by the Ethical Commission of Kore University.

Measures

Mindfulness Organizing Scale (MOS)

This 9-item scale developed by Vogus and Sutcliffe (2007), which was formerly known as the Safety Organizing Scale, surveys individual workers for their opinions about the dedication of their work units, departments, or organizations to stakeholder interests, quality assurance, managing uncertainty, and other positive business practices. Items are shown in Table 1. Each item was rated with a 3-point scale including 1 (*not at all*), 2 (*to some extent*), and 3 (*a great deal*). Consequently, the total score ranges from 9 to 27. Previous studies (Ausserhofer, Schubert, Blegen, De Geest, & Schwendimann, 2013) conducted on samples from different Swiss cantons reported the alpha coefficients for this scale as ranging from .79 to .92; alpha in Vogus and Sutcliffe's (2007) study was .88.

The Italian version of the items was tested by a back-translation into English, comparing it with the original with the support of an expert mother-tongue speaker. In order to support the validity of the MOS, the following eight short scales from Weick and Sutcliffe (2007; see Measurement of Organizational Mindfulness section) were administered.

Awareness of potential problems. It is composed of nine items with a 3-point Likert scale,

from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization; workers should indicate how much each feature corresponds to their organization. Alpha was .75.

Tendency toward carelessness. It is composed of eight items with a 3-point Likert scale, from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization; workers should indicate how much each feature corresponds to their organization. Alpha was .72.

Complexity of the organization. It is composed of nine items with a dichotomous response (*agree/disagree*), indicating whether or not each item could be applied to the worker's organization. Alpha was .71.

Preoccupation with failure. It is composed of 10 items with a 3-point Likert scale, from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization or team; workers should indicate how much each feature corresponds to their organization or team. Alpha was .66.

Reluctance to simplify. It is composed of 12 items with a 3-point Likert scale, from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization or team; workers should indicate how much each feature corresponds to their organization or team. Alpha was .77.

Sensitivity to operations. It is composed of nine items with a dichotomous response (*agree/disagree*), indicating whether or not each item could be applied to the worker's organization or team. Alpha was .82.

Commitment to resilience. It is composed of 10 items with a 3-point Likert scale, from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization or team; workers should indicate how much each feature corresponds to their organization or team. Alpha was .77.

Deference to expertise. It is composed of seven items with a 3-point Likert scale, from 1 (*not at all*) to 3 (*very much*), which describes the characteristics of an organization or team; workers should indicate how much each feature corresponds to their organization or team. Alpha was .78.

For all eight of Weick and Sutcliffe's (2007) scales, because of the lack of indications reported in the text, the reliability was calculated in our own sample.

Perceived Organizational Support Scale (POS)

Perceived Organizational Support (Eisenberger, Fasolo, & Davis-LaMastro, 1990), defined as employees' perception of the extent to which the organization values their contributions and cares for their well-being, was assessed with an 18-item scale developed by Eisenberger, Huntington, Hutchison, and Sowa (1986; Italian adaptation, Battistelli & Mariani, 2011). Each item was rated according to a 5-point scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include "The organization really cares about my well-being," "The organization values my contribution to its well-being," and "The organization fails to appreciate any extra effort from me." Alpha coefficient reported by the authors is .81.

Commitment to Organizational Change (CTC)

Herscovitch and Meyer's (2002) model of commitment is one of the most used to measure employee commitment. Described as "the glue that provides the vital bond within people and change goals" (Conner, 1992, p. 147), commitment is a central component in the model of effective

innovation implementation in the workplace (Klein & Sorra, 1996) for change initiatives (Armenakis, Harris, & Feild, 1999; Conner, 1992).

The three dimensions of organizational commitment in this model are affective, continuance, and normative. The 18 items used were adapted from measures developed by Herscovitch and Meyer (2002; Italian adaptation, Mari, Falvo, Hichy, & Capozza, 2005). Each of the items is measured according to a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Six items for each of the three dimensions of organizational commitment are included. Sample items include “Change is necessary for the organization,” “I have no choice but to go along with the restructuring programs initiated at the organization,” and “I feel a sense of duty to work toward the restructuring programs at the organization.” Alpha coefficients reported by the authors of the Italian version of the instrument are .85 for affective commitment, .80 for normative commitment, and .65 for continuance commitment.

Analyses

Gender and age differences were assessed preliminarily by means of *t*-test and ANOVA for different samples. In order to test the factor structure of the scale, a confirmatory factor analysis with one latent factor and nine observed variables (i.e., the single items) was performed by means of the software AMOS 21.0 (Arbuckle & Wothke, 1999) using the maximum likelihood method (ML estimation; Byrne, 2001) and comparing the indices with the acceptable threshold (Schermelleh-Engel, Moosbrugger, & Muller, 2003). To verify the general adequacy of the models, a solution fits the data well when χ^2 is nonsignificant, that is, $p > .05$ (Bentler, 1990). For structural equation models, a variety of further fit indices have been developed. These indices, however, can point to conflicting conclusions about the extent to which a model actually matches the observed data. Given that these statistics are sensitive to sample size, the two-index strategy (Hu & Bentler, 1999; Jöreskog & Long, 1993) proposes the combined use of a comparative fit index (CFI; the good fit value is between .95 and 1; Bentler, 1990), a standardized root mean square residual (SRMR; values lower than .08 are considered acceptable; Brown & Cudeck, 1993), and root mean square error of approximation (RMSEA; values lower than .05 are usually considered good; Hu & Bentler, 1999). The goodness-of-fit index (GFI) is a measure of fit between the hypothesized model and the observed covariance matrix. The GFI and adjusted GFI (AGFI) range between 0 and 1, with a value of over .90 generally indicating acceptable model fit (Bentler, 1990). The Akaike information criterion (AIC) was used to compare the relative fit of models, with lower AIC values indicating superior model fit (Burnham & Anderson, 2002). Modification indices were also inspected to assess the extent to which the hypothesized model was appropriately described (Byrne, 2001). Modification indices “reflect an approximation of how much the overall model chi-square would decrease if the fixed or constrained parameter was freely estimated” (Brown, 2006, p. 119). Correlated errors are specified when some of the shared variance between two observed items is not explained by the latent factor.

The multivariate normality of distribution was assessed through Mardia’s (1970) coefficient. According to Bollen (1989), if Mardia’s coefficient is lower than $P(P+2)$, where P is the number of observed variables, then multivariate normality can be deduced, allowing for the

use of the ML estimation method (Arbuckle & Wothke, 1999; Khine, 2013; Kline, 2005; Muthén & Kaplan, 1985; Raykov & Marcoulides, 2006).

Classical item analysis of the revised scale was performed, including alpha and the Spearman-Brown coefficient, and concurrent validity was assessed correlating the MOS score with the measures described above. Pearson's r coefficient and significances after Bonferroni's correction will be reported.

RESULTS

Gender and Age Differences

We preliminarily verified the existence of gender differences in the scores of the MOS single items. As reported in Table 3, there are no significant differences between males and females in the scores of the items.

TABLE 3
Gender differences in the nine MOS items and statistical significance (t -test)

	M ($N = 330$)		F ($N = 324$)		t	p
	M	SD	M	SD		
Item 1	1.81	0.73	1.79	0.66	0.44	.66
Item 2	1.88	0.70	1.86	0.70	0.32	.75
Item 3	1.89	0.73	1.90	0.71	-0.13	.90
Item 4	2.00	0.92	1.98	0.75	0.28	.78
Item 5	2.15	0.74	2.24	0.70	-1.54	.13
Item 6	2.13	0.72	2.17	0.68	-0.84	.40
Item 7	2.10	0.72	2.15	0.72	-0.80	.42
Item 8	2.12	0.73	2.19	0.68	-1.15	.25
Item 9	2.16	0.74	2.19	0.72	-0.54	.59

None of the differences regarding age was statistically significant, and the linear correlation between age and MOS score was small and nonsignificant (Pearson $r = -.17$). These preliminary results allow for the analyses to be performed for the entire sample.

Factor Structure

The results of CFA indicated that the one-factor model can be confirmed using the ML estimation method (Mardia's coefficient was 12.86, allowing the use of this method), but the value of some indices is below the acceptable threshold.

The first model did not fit the data well, suggesting that the model was not adequate (see Table 4, Model 1). This result suggested the need for changes in the original scale. In particular,

the homogeneity of the items' internal consistency and the modification indices suggested the need to remove Item 7, "We spend time identifying activities we do not want to go wrong" (see Table 4, Model 2).

The second largest modification index suggested that there was shared content between Items 2, 3; 4, 5; and 8, 9; when their error variances were allowed to correlate — with the correlate reduction of degrees of freedom in the analysis — fit indices improved again (see Table 4, Model 3), and Mardia's coefficient reduced to 10.03, indicating an acceptable level according to the criteria reported above (Khine, 2013).

TABLE 4
Confirmatory factor analysis for the MOS by solutions

Solutions	$\chi^2(df)^a$	SRMR	RMSEA	CFI	GFI	AGFI	AIC	CMIN/df
Model 1 (nine-item solution)	218.052(27)	.10	.11	.92	.92	.87	254.040	8.076
Model 2 ^b (eight-item solution)	174.538(20)	.08	.08	.93	.93	.89	206.538	8.727
Model 3 ^c (eight-item solution)	48.898(17)	.07	.05	.99	.98	.96	86.898	2.876

Note. ^aAll chi-square values are significant at $p < .001$. ^bIn Model 2, Item 7 has been removed. ^cIn Model 3, the error variances of Items 2, 3; 4, 5; 8, 9 have been correlated. SRMR = standardized root mean square residual; RMSEA = root mean square error of approximation; CFI = comparative fit index; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; AIC = Akaike information criterion; CMIN/df = minimum discrepancy divided by the degrees of freedom.

In particular the covariance error terms between Item 2 "We talk about mistakes and ways to learn from them," and Item 3, "We discuss our unique skills with each other so that we know who has relevant specialized skills and knowledge" result congruent with the consideration that being able to avoid making mistakes (Item 2), and having specific expertise for the goal to be achieved (Item 3), may be perceived as closely related (Edmondson, 1996; Ichniowski, Shaw, & Prennushi, 1997; Naveh, Katz-Navon, & Stern, 2005). In an analogous way, Items 4 and 5 are very similar in the content: "We discuss alternatives as to how to go about our normal work activities" (4) and "When discussing emerging problems with co-workers, we usually discuss what to look out for" (5); the same for Items 8 and 9: "When errors happen, we discuss how we could have prevented them" (8) and "When a crisis occurs, we rapidly pool our collective expertise to attempt to resolve it" (9). Therefore, these items can share their content in the model. Landis, Edwards, and Cortina (2009) argue that estimation of measurement errors in SEM is appropriate when indicator variables share components.

The relationship between the factor and its indicator is represented by a factor loading. The variance of measurement error was estimated. All factors loadings were significant (see Table 5).

The test for the equality of factor loadings allowed us to compare multiple samples across the same measurement instrument or multiple population groups. We tested the equality of the factor

TABLE 5
Factor loadings of the Mindfulness Organizing Scale – eight items ($N = 654$)

	Factor 1
Item 1	.61***
Item 2	.71***
Item 3	.72***
Item 4	.76***
Item 5	.69***
Item 6	.63***
Item 8	.66***
Item 9	.64***

*** $p < .001$.

loadings for two separate groups in our sample: males and females. Before testing measurement invariance across groups, we needed to test the individual models first. If consistency is found, then it is possible to proceed with multiple groups testing. The general procedure was to test measurement invariance between the unconstrained models for all groups combined, then for a model with constrained parameters (parameters are constrained so as to be equal between the groups). If the difference in the chi-square statistics between the original and the constrained models was not significant, then we concluded that the model had measurement invariance across groups. We considered factor loadings to be equal because the difference in the chi-square between two models was not significant. Wheaton, Muthen, Alwin, and Summers (1977) suggested that a *relative* chi-square (χ^2/df) should be computed. In our sample, equal loading = .685, $df = 87$, and $\chi^2/df = 2.414$. A relative chi-square ratio of < 3 is “indicative of an acceptable fit between the hypothetical model and the sample data” (Carmines & McIver, 1981, p. 80).

Finally, the invariance of the factor structure across sample was tested using the multigroup procedure (Byrne, 1998). Three models were compared: the baseline model (M_1), the invariance of the factor loadings (M_2), and the invariance of error (M_3). The results (Table 6) showed that the females and the males in the sample have an invariant factor structure.

TABLE 6
Test of invariance of structure of the Mindfulness Organizing Scale

Goodness-of-fit indices		$\Delta\chi^2$	
M_1	$\chi^2(87) = 209.97, p < .001$; CFI = .970; RMSEA = .031		
M_2	$\chi^2(89) = 210.10, p < .001$; CFI = .970; RMSEA = .029	M_2-M_1	$\Delta\chi^2(1) = 0.134; ns$
M_3	$\chi^2(105) = 216.8, p < .001$; CFI = .973; RMSEA = .029	M_2-M_3	$\Delta\chi^2(16) = 6.696; ns$

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation.

Item Analysis

Table 7 shows the item analysis of the eight-item scale. All of the items had adequate values, and the overall alpha values (.89) should not be increased by eliminating some items.

TABLE 7
Item analysis of Mindfulness Organizing scale – eight items ($N = 654$)

Item	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Item-total correlation (excluding item)	alpha excluding item
1. We have a good “map” of each person’s talents and skills	1.80	0.70	0.30	−0.94	.54	.89
2. We talk about mistakes and ways to learn from them	1.87	0.70	0.19	−0.98	.66	.88
3. We discuss our unique skills with each other so that we know who has relevant specialized skills and knowledge	1.89	0.72	0.16	−1.06	.66	.88
4. We discuss alternatives as to how to go about our normal work activities	1.98	0.74	0.04	−1.18	.68	.87
5. When discussing emerging problems with co-workers, we usually discuss what to look out for	2.19	0.72	−0.30	−1.02	.67	.87
6. When attempting to resolve a problem, we take advantage of the unique skills of our colleagues	2.15	0.70	−0.21	−.04	.63	.88
8. When errors happen, we discuss how we could have prevented them	2.15	0.71	−0.23	−1.00	.68	.87
9. When a crisis occurs, we rapidly pool our collective expertise to attempt to resolve it	2.18	0.73	−0.28	−1.08	.65	.88

Note. alpha = .89; Spearman-Brown coefficient = .91.

The total score of the eight-item MOS scale ranged from 8 to 24, with mean = 15.35, standard deviation = 3.71, skewness = 0.25, kurtosis = −0.09, and the Shapiro-Wilk statistic for normality = 0.97 (Shapiro & Wilk, 1965), confirming the very good distribution of scores (see also Figure 1). Quartiles of scores in our general sample were 13 (Q1), 15 (Median), and 18 (Q3).

Concurrent Validity

The concurrent validity of the MOS was tested in a selected subsample ($N = 298$) using the measures of the antecedents and the single dimensions of organizational mindfulness proposed

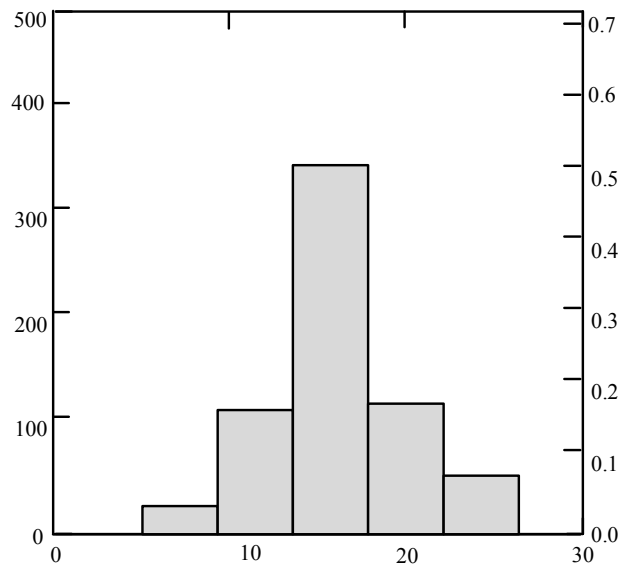


FIGURE 1
Distribution of frequency of the MOS total score (eight-item scale).

by Weick and Sutcliffe (2007). Moreover, in a subsample of $N = 456$, we correlated the MOS total score with other organizational constructs that can be hypothesized as being associated with organizational mindfulness: commitment to change (CTC) and perceived organizational support (POS).

The correlations between the MOS and the other scales are reported in Table 8. We can observe positive and significant correlations with POS, two of three dimensions of CTC (affective and normative), and five of Weick and Sutcliffe's (2007) eight scales: awareness of potential problems, preoccupation with failure, reluctance to simplify, commitment to resilience, and deference to expertise. The lower values of correlations in commitment to change (not significant for continuous commitment) can be explained by considering that mindfulness implies commitment to change, but the two constructs, particularly regarding persistence, are substantially different from one another.

DISCUSSION

The aim of the present study was to verify the psychometric properties of the Mindfulness Organizing Scale in the Italian context. The results provide evidence for the reliability and validity of the Italian version of the MOS. Having found no gender differences, we conducted the analysis on the whole sample.

Confirmatory factor analysis verified the one-factor solution proposed by the authors; however, in the Italian version, we obtained the best factorial solution by deleting Item 7. We then tested the equality of the factor loadings for two separate groups of our sample, males and females, and confirmed the same factor structure for the two groups. The eight-item MOS has an excellent internal consistency reliability, well above the suggested threshold of .80 (Nunnally & Bernstein, 1994).

TABLE 8
Correlations between the total score of the eight-item MOS, POS, and CTC ($N = 456$), and Weick and Sutcliffe's (2007) scales ($N = 298$). Pearson's r coefficient and significances after Bonferroni's correction

	eight-item MOS
POS total score	.46***
CTC – Affective	.28***
CTC – Normative	.24***
CTC – Continuous	.02
Weick and Sutcliffe's scales	
Awareness of potential problems	.37**
Tendency toward carelessness (R)	-.07
Complexity of the organization	-.05
Preoccupation with failure	.46***
Reluctance to simplify	.47***
Sensitivity to operations	-.01
Commitment to resilience	.64***
Deference to expertise	.69***

Note. (R) = reversed coded. MOS = Mindfulness Organizing Scale; POS = perceived organizational support; CTC = commitment to change.

Finally, the scale shows evidence of validity. Concurrent validity was verified by analyzing correlations with some related constructs — the antecedents and the single dimensions of organizational mindfulness and two organizational positive constructs — that, in the literature, can be associated with organizational behaviors included in mindfulness: commitment to change and perceived organizational support. We found higher correlations with the single dimensions of organizational mindfulness and some significant correlations with organizational support and two dimensions of the commitment to change (affective and normative).

These results support the relevance of measuring organizational mindfulness, as already stated in the pertinent literature. In a study on psychological capital, Avey, Wernsing, and Luthans (2008) demonstrated that organizational mindfulness is important for supporting positive organizational change, underlining that “the more mindful awareness employees have of their PsyCap and positive emotions, or lack thereof, the more it can facilitate positive attitudes and behaviors relevant to organizational changes” (p. 57). Moreover, resilience in organizations (that is one of the components of mindfulness) is related to motivation for achievement (Magnano, Craparo, & Paolillo, 2016).

Organizational mindfulness, as measured by the MOS, is related to organizational support. In their empirical study, Hofmann and Morgeson (1999) found that POS is a predictor of safety-related communication and commitment. Diao and Park (2011) underlined that POS may emanate either from the immediate supervisor or from other senior managers. Supportive supervisors induce individuals' willingness to engage in development activities (Noe, 1996). In some organizations, social support provided by the supervisor may take the form of career guidance, learning opportunities, and challenging work assignments (Greenhaus, Parasuraman, & Wormley, 1990).

LIMITATIONS AND CONCLUSIONS

The findings of our study should be considered in the light of its limitations. Firstly, the research was conducted using a convenience sample in which there was a prevalence of workers in public administration. The distribution of the sample according to age and the region of the country was not matched, even if almost all Italian regions were represented in the sample.

In future studies, the equality invariance for factor loadings should also be tested for the variables age and region with both representative and matched samples. Moreover, the cross-sectional nature of the study did not allow to verify the predictive validity of the scale.

Despite these limitations, the validation of MOS fills an important gap in assessing the behavioral underpinnings of organizations that aim to become HROs. The Italian validation of the MOS follows the calls for investigating the behaviors facilitating error prevention, and the content of this measure is closely aligned with case studies documenting the association of such behaviors with high levels of safety (Vogus & Sutcliffe, 2007) and, consequently, with lower levels of stress (Davidson et al., 2003).

In summary, the Italian MOS gives some relevant contributions. It provides a quick but reliable self-report measure of the organizational behaviors that lead to the emergence of a safety culture, and it is strongly associated with the reduction of work-related accidents and stressors (Weick et al., 1999). Moreover, the MOS is a useful tool for understanding both how and under what conditions interventions could be designed to improve reliability in organizations. Future research could improve the psychometric properties (e.g., predictive validity) of the scale through a longitudinal research design, and could relate organizational mindfulness with some organizational outcomes (e.g., performance, engagement).

REFERENCES

- Alexander, C., Langer, E. J., Newman, R., Chandler, H., & Davies, J. (1989). Aging, mindfulness and meditation. *Journal of Personality and Social Psychology*, 57, 950-964. doi:10.1037/0022-3514.57.6.950
- Arbuckle, J. L., & Wothke, W. (1999). *AMOS 4.0 user's guide*. Chicago, IL: SmallWaters.
- Armenakis, A. A., Harris, S. G., & Feild, H. S. (1999). Paradigms in organizational change: Change agent and change target perspectives. In R. T. Golembiewski (Ed.), *Handbook of organizational behavior*, (pp. 631-658). New York, NY: Marcel Dekk.
- Ausserhofer, D., Schubert, M., Blegen, M., De Geest, S., & Schwendimann, R. R. (2013). Validity and reliability on three European language versions of the Safety Organizing Scale. *International Journal for Quality in Health Care: Journal of the International Society for Quality in Health Care*, 25, 157-166. doi:10.1093/intqhc/mzt001
- Avey, J. B., Wernsing, T. S., & Luthans, F. (2008). Can positive employees help positive organizational change? Impact of psychological capital and emotions on relevant attitudes and behaviors. *The Journal of Applied Behavioral Science*, 44, 48-70. doi:10.1177/0021886307311470
- Bannerman, P., Reich, B. H., Sauer, C., & Liu, L. (2013). Developing better theory about project organizations. *International Journal of Project Management*, 31(7), 938-942.
- Battistelli, A., & Mariani, M. G. (2011). *Supporto organizzativo: Validazione della versione italiana della Survey of Perceived Organizational Support (versione a 8 item)* [Perceived organizational support: Italian validation of the perceived organizational support (8 items version)]. *Giornale Italiano di Psicologia*, 38, 189-214. doi:10.1421/34845
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246.
- Boin, A., & Schulman, P. (2008). Assessing NASA's safety culture: The limits and possibilities of high-reliability theory. *Public Administration Review*, 68(6), 1050-1062.

- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: John Wiley.
- Brown, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equations models* (pp. 136-162). Newbury Park, CA: Sage.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848. doi:10.1037/0022-3514.84.4.82
- Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, 18, 211-237. doi:10.1080/10478400701598298
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Press.
- Burnham, K. P., & Anderson, D. R. (2002). *Model selection and multimodel inference: A practical information-theoretic approach*. New York, NY: Springer.
- Butler, B. S., & Gray, P. H. (2006). Reliability, mindfulness, and information systems. *MIS Quarterly*, 30(6), 211-224.
- Byrne, B. M. (1998). *Structural Equation Modeling with LISREL, PRELIS and SIMPLIS: Basic concepts, applications and programming*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Byrne, B. M. (2001). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum.
- Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobservable variables. In G. W. Bohrnstedt & E. F. Borgatta (Eds.), *Social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage Publications.
- Carroll, J. S., & Rudolph, J. W. (2006). Design of high reliability organizations in health care. *Quality & Safety in Health Care*, 15, i4-i9. doi:10.1136/qshe.2005.015867
- Conner, D. R. (1992). *Managing at the speed of change: How resilient managers succeed and prosper where others fail*. New York, NY: Villard Books.
- Dane, E., & Brummel, B. J. (2013). Examining workplace mindfulness and its relations to job performance and turnover intention. *Human Relations*, 67, 105-128. doi:10.1177/0018726713487753
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65, 564-570. doi:10.1097/01.PSY.0000077505.67574.E3
- Diao, A., & Park, D. S. (2011). Successful careers of culturally intelligent workers in multinational organizations: The mediating role of perceived organizational support. *World Journal of Social Sciences*, 1(5), 54-71.
- Edmondson, A. C. (1996). Learning from mistakes is easier said than done: Group and organizational influences on the detection and correction of human error. *Journal of Applied Behavioral Science*, 32, 5-28. doi:10.1177/0021886396321001
- Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology*, 75, 51-59. doi:10.1037/0021-9010.75.1.51
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500-507.
- Gellatly, I. R., Meyer, J. P., & Luchak, A. A. (2006). Combined effects of the three commitment components on focal and discretionary behaviors: A test of Meyer and Herscovitch's propositions. *Journal of Vocational Behavior*, 69, 331-345. doi: 10.1016/j.jvb.2005.12.005
- Golzio, L. E., Lalla, M., & Manni, M. G. (2014). Managing the unexpected: A case study. *Rivista Italiana di Economia Demografia e Statistica*, LXVIII(1), 167-174.
- Greenhaus, J., Parasuraman, S., & Wormley, W. (1990). Effects of race on organizational experiences, job performance evaluations, and career outcomes. *Academy of Management Journal*, 33, 64-86. doi:10.2307/256352
- Hede, A. (2010). The dynamics of mindfulness in managing emotions and stress. *Journal of Management Development*, 29, 94-110. doi:10.1108/02621711011009090
- Herscovitch, L., & Meyer, J. P. (2002). Commitment to organizational change. *Journal of Applied Psychology*, 87, 474-487. doi:10.1037/0021-9010.87.3.474
- Hofmann, D. A., & Morgeson, F. P. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader-member exchange. *Journal of Applied Psychology*, 84, 286-296. doi:10.1037/0021-9010.84.2.286

- Hoy, W. K., Gage, C. Q., & Tarter, C. J. (2004). Theoretical and empirical foundations of mindful schools. In W. K. Hoy & C. Miskel (Eds.), *Educational organizations, policy and reform: Research and measurement* (pp. 305-335). Greenwich, CT: Information Age.
- Hoy, W. K., Gage, C. Q., & Tarter, C. J. (2006). School mindfulness and faculty trust: Necessary conditions for each other? *Educational Administration Quarterly*, 42, 236-255. doi:10.1177/0013161X04273844
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55. doi:10.1080/10705519909540118
- Ichniowski, C., Shaw, K., & Prennushi, G. (1997). The effects of human resource management practices on productivity: A study of steel finishing lines. *American Economic Review*, 87(3), 291-313.
- Jacoby, J., & Matell, M. S. (1971). Three-point Likert scales are good enough. *Journal of Marketing Research*, 8(4), 495-500.
- Jöreskog, K., & Long, J. S. (1993). Introduction. In K. A. Bollen & J. Scott Long (Eds.), *Testing structural equation models* (pp. 294-325). Newbury Park, CA: Sage.
- Khine, M. S. (2013). *Application of structural equation modeling in educational research and practice*. Rotterdam, The Netherlands: Sense Publishers.
- Klein, K. J., & Sorra, J. S. (1996). The challenge of innovation implementation. *Academy of Management Review*, 21, 1055-1080. doi:10.5465/AMR.1996.9704071863
- Kline, R. B. (2005). *Principle and practice of structural equation modeling*. New York, NY: Guilford Press.
- Landis, R., Edwards, B. D., & Cortina, J. (2009). Correlated residuals among items in the estimation of measurement models. In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends: Doctrine, verity, and fable in the organizational and social sciences* (pp. 195-214). New York, NY: Routledge.
- Langer, E. J. (1989). *Mindfulness*. Boston, MA: Addison-Wesley.
- Langer, E. J. (2005). *On becoming an artist: Reinventing yourself through mindful creativity*. New York, NY: Ballantine.
- Langer, E. J. (2009). *Counterclockwise: Mindful health and the power of possibility*. New York, NY: Ballantine Books.
- Langer, E. J., Beck, P., Janoff-Bulman, R., & Timko, C. (1984). The relationship between cognitive deprivation and longevity in senile and non-senile elderly populations. *Academic Psychology Bulletin*, 6, 211-226.
- Langer, E. J., Heffernan, D., & Kiester, M. (1988). *Reducing burnout in an institutional setting: An empirical investigation*. Unpublished manuscript, Harvard University, Cambridge, MA.
- Lehmann, D. R., & Hulbert, J. (1972). Are three-point scales always good enough? *Journal of Marketing Research*, 9(4), 444-446.
- Levinthal, D., & Rerup, C. (2006). Crossing an apparent chasm: Bridging mindful and less-mindful perspectives on organizational learning. *Organization Science*, 17, 502-513. doi:10.1287/orsc.1060.0197
- Magnano, P., Craparo, G., & Paolillo, A. (2016). Resilience and emotional intelligence: Which role in achievement motivation. *International Journal of Psychological Research*, 9(1), 9-20.
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57, 519-530. doi:10.2307/2334770
- Mari, S., Falvo, R., Hichy, Z., & Capozza, D. (2005). Validità della scala di Impegno al Cambiamento di Herscovitch e Meyer in un contesto organizzativo italiano [Validity of the Herscovitch and Meyer's Commitment to Change Scale in an organizational Italian context]. *TPM – Testing, Psychometrics, Methodology in Applied Psychology*, 12(4), 247-260.
- Meyer, J. P., Allen, N. J., & Smith, C. A. (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, 78, 538-551. doi:10.1037/0021-9010.78.4.538
- Morgeson, F. P., & Hofmann, D. A. (1999). The structure of collective constructs: Implications for multi-level research and theory development. *Academy of Management Review*, 24, 249-265. doi:10.5465/AMR.1999.1893935
- Muthén, B., & Kaplan, D. (1985). A comparison of methodologies for the factor analysis of non-normal Likert variables. *British Journal of Mathematical and Statistical Psychology*, 38(1), 171-189.
- Naveh, E., Katz-Navon, T., & Stern, Z. (2005). Treatment errors in healthcare: A safety climate approach. *Management Science*, 51(6), 948-960.

- Noe, R. A. (1996). Is career management related to employee development and performance? *Journal of Organizational Behavior*, 17(2), 119-133.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York, NY: McGraw-Hill.
- Ray, J. L., Baker, L. T., & Plowman, D. A. (2011). Organizational mindfulness in business schools. *Academy of Management Learning & Education*, 10(2), 188-203.
- Raykov, T., & Marcoulides, G. A. (2006). *A first course in structural equation modelling*. Mahwah, NJ: Erlbaum.
- Reason, J. T. (1997). *Managing the risk of organizational accidents*. Burlington, VT: Ashgate Publishing.
- Rerup, C. (2005). Learning from past experience: Footnotes on mindfulness and habitual entrepreneurship. *Scandinavian Journal of Management*, 21, 451-472. doi:10.1016/j.scaman.2005.09.010
- Rerup, C. (2009). Attentional triangulation: Learning from unexpected rare crises. *Organization Science*, 20(5), 876-893.
- Runco, M. A. (2007). *Creativity: Theories and themes – Research. Development and practice*. Amsterdam, The Netherlands: Elsevier.
- Runco, M. A., & Albert, R. S. (1990). *Theories of creativity*. Newbury Park, CA: Sage Publications, Inc.
- Ryle, G. (1949). *The concept of mind*. Chicago, IL: University of Chicago Press.
- Sandelands, L. E., & Stablein, R. E. (1987). The concept of organizational mind. *Research in the Sociology of Organizations*, 5, 135-162.
- Saunders, F. C. (2015). Toward high reliability project organizing in safety-critical projects. *Project Management Journal*, 46, 25-35. doi:10.1002/pmj.21498
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Test of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23-74.
- Schulman, P. R. (2004). General attributes of safe organizations. *Quality & Safety in Health Care*, 13, 39-44. doi:10.1136/qshc.2003.009613
- Senge, P. M., Scharmer, C. O., Jaworski, J., & Flowers, B. S. (2005). *Presence: An exploration of profound change in people, organizations, and society*. New York, NY: Crown Business.
- Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika*, 52, 591-611. doi:10.2307/2333709
- Sternberg, R. J. (2000). Images of mindfulness. *Journal of Social Issues*, 56, 11-26. doi:10.1111/0022-4537.00149
- Swanson, E. B., & Ramiller, N. C. (2004). Innovating mindfully with information technology. *MIS Quarterly*, 28(4), 553-583.
- Tolk, J. N., Cantu, J., & Beruvides, M. (2015). High reliability organization research: A literature review for health care. *Engineering Management Journal*, 27, 218-237. doi:10.1080/10429247.2015.1105087
- Vogus, T. J., & Sutcliffe, K. M. (2007). The safety organizing scale: Development and validation of a behavioral measure of safety culture in hospital nursing units. *Medical Care*, 45, 46-54. doi:10.1097/01.mlr.0000244635.61178.7a
- Vogus, T. J., & Sutcliffe, K. M. (2012). Organizational mindfulness and mindful organizing: A reconciliation and path forward. *Academy of Management Learning and Education*, 11, 722-735. doi:10.5465/amle.2011.0002C
- Vogus, T. J., & Welbourne, T. M. (2003). Structuring for high reliability: HR practices and mindful processes in reliability-seeking organizations. *Journal of Organizational Behavior*, 24, 877-903. doi:10.1002/job.221
- Wasti, S. A. (2005). Commitment profiles: Combinations of organizational commitment forms and job outcomes. *Journal of Vocational Behavior*, 67, 290-308. doi:10.1016/j.jvb.2004.07.002
- Weick, K. E., & Putnam, T. (2006). Organizing for mindfulness: Eastern wisdom and western knowledge. *Journal of Management Inquiry*, 15, 275-287. doi:10.1177/1056492606291202
- Weick, K. E., & Roberts, K. H. (1993). Collective mind in organization: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 38(3), 357-381.
- Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected. Assuring high performance in an age of complexity*. San Francisco, CA: Jossey-Bass.
- Weick, K. E., & Sutcliffe, K. M. (2006). Mindfulness and the quality of organizational attention. *Organization Science*, 17, 514-524. doi:10.1287/orsc.1060.019.
- Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the unexpected: Resilient performance in an age of uncertainty*. San Francisco, CA: John Wiley & Sons.

-
- Weick, K., Sutcliffe, K. M., & Obstfeld, D. (1999). Organizing for high reliability: Processes of collective mindfulness. In B. Staw & R. Sutton (Eds.), *Research in organizational behavior* (Vol. 21, pp. 81-123). Stanford, CT: JAI Press.
- Wheaton, B., Muthen, B., Alwin, D. F., & Summers, G. (1977). Assessing reliability and stability in panel models. *Sociological Methodology*, 8, 84-136. doi:10.2307/270754
- Wilson, K. A., Burke, C. S., Priest, H. A., & Salas, E. (2005). Promoting health care safety through training high reliability teams. *Quality & Safety in Health Care*, 14, 303-309. doi:10.1136/qshc.2004.010090
- Zivnуска, S., Kacmar, K. M., Ferguson, M., & Carlson, D. S. (2016). Mindfulness at work: Resource accumulation, well-being, and attitudes. *Career Development International*, 21, 106-112. doi:10.1108/CDI-06-2015-0086
- Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. *Journal of Applied Psychology*, 65(1), 96-102.
-