■ *Research Paper*

Learning Behaviours in the Workplace: The Role of High-quality Interpersonal Relationships and Psychological Safety

Abraham Carmeli[1]*, Daphna Brueller[2] and Jane E Dutton[3]

[1]*Graduate School of Business Administration, Bar-Ilan University, Ramat-Gan 52900, Israel*
[2]*Graduate School of Business Administration, Bar-Ilan University, Ramat-Gan 52900, Israel*
[3]*University of Michigan, Ann Arbor, MI, USA*

Organizational learning is an important means for improving performance. Learning is a process, that is, often relational in the sense of relying on interactions between people to determine what needs improving and how to do it. This study addresses the question of how the quality of work relationships facilitates learning behaviours in organizations through the ways it contributes to psychological safety. Data collected from 212 part-time students who hold full-time jobs in organizations operating in a wide variety of industries show that capacities of high-quality relationships (measured at time 1) are positively associated with psychological safety, which, in turn, are related to higher levels of learning behaviours (measured at time 2). The results also show that experiences of high-quality relationships (measured at time 1) are both directly and indirectly (through psychological safety) associated with learning behaviours (measured at time 2). These findings shed light on the importance of quality relationships in the workplace for cultivating and developing perceptions of psychological safety and ultimately learning behaviours in organizations. Copyright © 2008 John Wiley & Sons, Ltd.

Keywords learning behaviours; high-quality relationships; psychological safety

INTRODUCTION

Organizational learning is a critical and complex process which enables a system to adapt to environmental jolts and grow, build and sustain competitive advantageous positions (Nair, 2001).

Learning behaviours in organizations such as frequently seeking new information, speaking up to test the validity of work assumptions and devoting time to figure out ways to improve work processes capture the ongoing process of reflection and action (Edmondson, 1999) through which knowledge is acquired, shared and combined (Argote, 1999; Argote *et al.*, 2001). As such, learning in organizations involves inter-actions among members of the organization

* Correspondence to: Abraham Carmeli, Graduate School of Business Administration, Bar-Ilan University, Ramat-Gan 52900, Israel.
E-mail: carmelia@mail.biu.ac.il

(Gherardi *et al.*, 1998; Elkjaer, 2003). Learning depends on members sharing knowledge and creating new solutions so things will be done more efficiently and effectively. Thus, learning can be seen as a dynamic behavioural process of interaction and exchange among work unit members (Kozlowski and Ilgen, 2006; Kozlowski and Bell, 2007). Similarly, recent research on inter-firm learning suggests that 'learning is a social process, with new benefits and liabilities that are underappreciated in a framework that views learning solely from the perspective of cognition or past organizational experiences (*cf.* Cohen and Levinthal, 1990; Argote, 1999)' (Uzzi and Lancaster, 2003, p. 397). Through a relational process of sharing and exchanging critical information, new ideas and insights are fostered (Kozlowski and Ilgen, 2006), thus enabling positive change in work processes and outcomes.

Conceptualizing learning as a relational process (Gherardi *et al.*, 1998; Elkjaer, 2003; Kozlowski and Ilgen, 2006; Kozlowski and Bell, 2007) highlights the fact that the nature of the relationships between members facilitates or impedes learning behaviours in organizations. Furthermore, a relational take on organizational learning is important and timely because work is becoming more interdependent (Thompson, 1967; Wageman, 1995; Kellogg *et al.*, 2006), as well as more complex ((e.g. work settings are becoming more virtual (see Raghuram *et al.*, 2001; Wiesenfeld *et al.*, 2001)). In these changing conditions, the importance of quality relationships among organizational members is increasing, while the achievement of quality relationships is more challenging.

A review of the literature indicates that we know relatively little about how relationships among members undermine or facilitate learning behaviours in organizations (Carmeli and Gittell, in press). Although researchers have noted the importance of interpersonal relationships as a facilitator of learning at work, 'its nature has often been left understudied' (Carmeli, 2007, p. 41). Notable, however, is research on psychological safety as a key enabler of learning behaviours (Edmondson, 1999, 2004; Cannon and Edmondson, 2001; Kahn, 2001). Psychological safety describes a perception that 'people are

comfortable being themselves' (Edmondson, 1999, p. 354) and 'feel able to show and employ one's self without fear of negative consequences to self-image, status or career' (Kahn, 1990, p. 708). Studies on psychological safety indicate that this is an important relational catalyst to learning behaviours in work settings.

In an effort to further understand relational antecedents of learning behaviours, researchers have examined how relational constructs such as informal dynamics and trust (Edmondson, 2004) enable psychological safety and facilitate learning behaviours. Edmondson (1996) found, for example, that the quality of interpersonal relationships is positively related to detected error rates ($r = .77$, $p < .03$) and noted that relationship quality may have allowed members to speak up and report on errors. Although these results point to the importance of relationship quality in fostering psychological safety and increasing members' willingness to report errors, Edmondson's (1996) study did not probe the complex relationship between relationships quality, psychological safety and learning behaviours. Furthermore, to the best of our knowledge no study has examined the dimensions of relationship quality that help researchers understand how and why interpersonal relationships foster psychological safety which in turn contributes to greater learning in organizations.

This paper explores the connection between relationship quality and learning through two distinct paths. First, it explores how both the capacities of high-quality relationships and the subjective experiences of high quality relationships predict learning behaviours. Second, it explores how psychological safety mediates the ways relationship quality affects organizational learning. Together these two paths address the relational and psychological mechanisms underlying organizational learning. A focus on the quality of relationships and their dimensions allows for more precise specification of the ways the nature of relational ties among people in an organization contributes to learning and broader issues such as the relational basis of organizational capabilities (e.g. a capability for mindful organizing (Weick and Roberts, 1993), a capability for compassionate organizing (Dutton *et al.*,

2006) and healing (Powley and Cameron, 2006) and a capability for downsizing (Gittell *et al.*, 2006)).

HIGH-QUALITY RELATIONSHIPS

Interpersonal relationships in the workplace have a significant impact on people (Dutton & Ragins, 2007; Ragins & Dutton, 2007; Kahn, 1990) and their engagement in interpersonal social behaviours (Choi, 2006), as well as on core processes such as coordination (Gittell, 2003) and error detection (Weick and Roberts, 1993). In work contexts, high-quality relationships are key channels through which members engage in learning behaviours that help the organization attain its goals (Lewin and Regine, 2000). The capacities enabled by high-quality interpersonal relationships allow members to exchange more variable information and ideas which are critical to creating and sharing solutions to problems and new ways to improve work processes and outcomes. At the same time, participants in high-quality relationships feel valued and connected in ways that allow them to overcome the uncertainty that accompanies working through problems and experimenting with solutions. Thus, both the capacities and subjective experiences of being in high-quality relationships can contribute to better organizational functioning.

Dutton and Heaphy (2003) proposed two clusters of relationship attributes as a means for capturing differences in relationship quality. Both clusters (and their accompanying dimensions) are meant to capture a more complete set of dimensions around which relationships can vary. The first cluster captures features of the interpersonal relationship between two people that tap into different aspects of capacity of the relationship. The second cluster captures the subjective experiences of each individual in the relationship. Whereas Dutton and Heaphy (2003) provided this two-part conceptual framework to describe high-quality relationships they did not conduct empirical analyses and they only hinted at the ways higher quality relationships might foster learning. This paper is a first attempt to provide theoretical reasoning and empirical examination of the features of high-quality relationships and their connection to learning behaviours.

The capacities and subjective experiences of high-quality relationships help to identify and define the characteristics that make a relationship healthy between two people (Dutton and Heaphy, 2003). Healthier relationships have different capacities that distinguish the functional features of the relationship and at the same time, healthier relationships feel different for the people in them. Emotional carrying capacity describes a relationship's capacity level for carrying both positive and negative emotions. Higher quality relationships have a greater emotional carrying capacity, suggesting they can handle the processing of more varied emotional information between two people. The tensility of a relationship captures a relationship's capacity level for bending and withstanding strain, accommodating changing conditions and the capacity for bouncing back from difficulties. Again, in higher quality relationships there is greater tensility, indicating the relationship has flexibility in the wake of different kinds of tensions and strains. Finally, the degree of connectivity captures a relationship's degree of openness to new ideas and influences, and the capacity to deflect behaviours that hinder generative processes. A higher quality relationship is marked by a higher degree of connectivity (Losada and Heaphy, 2004). All three indicators of a relationship's capacity point to different aspects of a relationship's functionality that allow people in the relationship to behave differently.

Research suggests that in higher quality relationships people have subjective experiences with a particular pattern—when in these relationships members experience vitality, positive regard and mutuality (Dutton and Heaphy, 2003). This study concentrates on the two experiences of positive regard and mutuality in the relationship. Positive regard denotes the extent to which individuals experience a sense of being known or loved (Rogers, 1951). In higher quality relationships, levels of positive regard are greater. Mutuality indicates that individuals in a high-quality relationship actively contribute to one another's development (Jordan, 1991). Together, positive

regard and mutuality in a relationship mean that individuals in higher quality relationships find the connection to be pleasurable and motivating, keeping them in a state that is likely to make them more willing to process information and work through problems. The capacities and experiences that mark high-quality relationships help in explaining why this form of connection is conducive to learning.

RELATIONSHIP QUALITY AND LEARNING BEHAVIOURS

Learning in organizations is a complex concept that can generally be conceptualized as either an outcome or a process. In this study, we assume organizational learning is a process and we measure it through reports of learning behaviours. This conceptualization is consistent with Argyris (1977) and Argyris and Schoen's (1978) definition of detecting and correcting error, Brown and Duguid's (2000) description of learning as a process of becoming 'an insider' by acquiring tacit or 'non-canonical' knowledge, Dewey's (1986) view of learning as an iterative process of designing, carrying out, reflecting upon and modifying actions, Argote *et al.*'s (2001) concept of learning as the process by which knowledge is acquired, shared and combined, and Edmondson's (1999, p. 353) approach to learning as an ongoing process of reflection and action, which is characterized by 'asking questions, seeking feedback, experimenting, reflecting on results and discussing errors or unexpected outcomes of actions'.

Thus, in quality relationships people are able to open up and grasp their own and others' points of view more fully, enhance their attentional capacities for detecting organizational signals (weak or strong) and increase their cognitive capacities regarding how to approach activities. High-quality relationships are a mechanism that provides both an enabling structure (through relationship capacities) and encouraging psychological conditions (through subjective experiences) that help foster learning behaviours in work settings. Indeed, research has indicated that good interpersonal relationships are critical for encouraging learning within and between organizations (Dodgson, 1993).

However, we posit that the link between high-quality relationships and learning in organizations is better understood when considering the intervening role of psychological safety. We postulate that in higher quality relationships people develop perceptions of being comfortable to speak up without excessive concerns about the interpersonal consequences of this act. This effect occurs because the capacities to express emotions, to endure times of conflict and to have open and generative conversations, as well as the experiences of being valued and able to be fully participative induce perceptions of being psychologically safe to take interpersonal risks. It is likely that people in these higher quality relationships know that the relationship will endure. People who feel psychologically safe are likely to be more willing to engage in learning behaviours that have the potential to create a positive change.

RELATIONSHIP QUALITY AND LEARNING BEHAVIOURS: THE MEDIATING ROLE OF PSYCHOLOGICAL SAFETY

We further break down the logic underlying the mediating role of psychological safety by detailing how each dimension of high quality relationships contributes to the perception of psychological safety and the link between safety and learning behaviours.

Capacities of High-quality Relationships and Psychological Safety

Emotional Carrying Capacity
When relationships have greater emotional carrying capacity it is acceptable for people to display a range of emotions in the relationship, increasing the probability that both people will be understood (Dutton and Heaphy, 2003). A greater capacity for communicating the full spectrum of emotions in a relationship contributes to psychological safety because individuals see that various emotions can be expressed without interpersonal consequences such as embarrassment. In higher quality relationships, members have the capacity to express negative

emotions and therefore are more likely to feel that it is safe to speak up without fear of harmful reactions. Thus, we argue that a greater emotional carrying capacity in a relationship between people is associated with a higher degree of psychological safety in the workplace.

Tensility

Dutton and Heaphy (2003) argue that higher quality relationships are marked by a tensility that allows the relationship to bend and withstand stress and conflict and bounce back after setbacks. The characteristic of tensility captures the flexibility of the relationships. Tensility gives relationship partners the sense that they do not need to be overly cautious in their interactions. Being in a relationship with tensility develops comfort with being oneself and not worrying about the interpersonal consequences of displays of authentic behaviour. Thus, a relationship's tensility or capacity to withstand challenging events and episodes in an interpersonal relationship is an important quality that contributes to people's sense of psychological safety.

Connectivity

Connectivity of a relationship captures the degree of openness of the tie to new information (Losada, 1999; Losada and Heaphy, 2004). When there is connectivity in the relationship, people are more likely to feel comfortable to open themselves up to new approaches, without fearing that their image and status will be damaged. Connectivity in relationships facilitates non-defensive reactions and encourages members to be open to and speak up about new challenges. Conversely, a lack of openness in a relationship creates a situation where members are more afraid to speak out, which exemplifies an absence of psychological safety. Thus, connectivity in a relationship is a mechanism that enables individuals to feel psychologically safe.

Experiences of High-quality Relationships and Psychological Safety

Beyond the capacities of high quality relationships, two aspects of subjective experience are likely to foster a sense of psychological safety.

Positive Regard

People in high-quality relationships have a sense of 'deep contact' (Quinn and Quinn, 2002) and experience a feeling of being known or respected by the person or people (Dutton and Heaphy, 2003), even if the relationship is short in duration. Individuals who are known and respected in their work setting act out of the knowledge that they are appreciated for what they represent. When employees engage one another respectfully, they reflect an image that is positive and valued. They create a sense of social dignity, which confirms each other's worth and sense of competence (Dutton, 2003b). Beliefs that others see oneself as competent are important because those who feel that their competencies are in question are more likely to feel judged or monitored, keeping their viewpoints to themselves for fear of harming their image (Edmondson, 2004). In contrast, when people in a relationship are actively looking for value in their counterparts, it produces a context in which members can speak freely about their thoughts and feelings (Dutton, 2003b; Zander and Zander, 2000). Thus, when people know they are appreciated and valued, they are likely to feel safe to speak up and discuss problems without fearing interpersonal consequences.

Mutuality

Mutuality is 'a way of relating, a shared activity in which each (or all) of the people involved are participating as fully as possible' (Miller and Stiver, 1997, p. 43). It captures the state where people in a relationship are engaged and actively participating (Dutton and Heaphy, 2003). Jordan (1991) indicated that feelings of mutuality increase the willingness of individuals to self-disclose. Similar patterns have been identified in supervisory relationships where research showed that a supervisor's appreciation of mutuality helped to create a sense of safety for supervisees (Frawley-O'Dea and Sarnat, 2001). Walsh *et al.*, 2002 study showed that a feeling of mutuality was the most important factor influencing trainees' willingness to disclose mistakes to their supervisors. Hence, when there is a high degree of mutuality, there is greater mutual

empathy, which fosters a sense of psychological safety.

Based on the above arguments, we propose that both capacities and experiences of high-quality relationships are associated with higher levels of psychological safety:

Hypothesis 1a: Capacities of high-quality relationships are positively associated with psychological safety.

Hypothesis 1b: Subjective experiences of high-quality relationships are positively associated with psychological safety.

Psychological Safety and Learning

The work of Edmondson provides compelling logic for why psychological safety should foster learning. Learning behaviours such as seeking help from people who are in a position to judge skills and performance involves interpersonal risk. Psychological safety lessens concerns about being judged as incompetent when seeking and asking for help from people in positions of superiority. Similarly, when people seek feedback on their work they put themselves at risk of being criticized and even humiliated. Perceptions of being psychologically safe alleviate these concerns and are likely to encourage learning behaviours such as seeking feedback from others. In addition, psychological safety facilitates learning behaviours such as speaking up about mistakes and testing work assumptions, because it allows those who speak up to believe that they will not be seen as people who have 'crossed the line' but rather as members who contribute to eliminating errors and enabling working assumptions that help to build a more robust system (Edmondson, 2004). Hence

Hypothesis 2: Psychological safety is positively associated with learning behaviours in organizations.

Because work is becoming highly interdependent, members often need other individuals to provide them with information or perspective and to help them resolve various issues. However, learning behaviours such as seeking help, asking for feedback and speaking up about errors and work assumptions involve interpersonal

risk, especially when the person in a position to provide assistance may also judge the individual's performance or competency (Lee *et al.*, 2003; Lee *et al.*, 2004). As described above, high-quality relationships foster perceptions of psychological safety, which is a key mechanism for learning behaviours such as feedback seeking because it alleviates excessive concern about others' reactions (Edmondson, 2004). We reason that psychological safety is developed through relationship quality and serves as a key social-psychological mechanism through which people are able to engage in learning behaviours, raise concerns and talk about things openly. Conversely, learning behaviours are obstructed when people experience interpersonal threat since they often feel 'learning anxiety' and rely on their 'defensive routines' (Edmondson, 2004). Reliance on these defensive mechanisms to reduce negative interpersonal threat affects individuals' status, image and career. However, they also thwart both individual and organizational learning (Edmondson, 2004).

In high-quality relationships individuals are likely to engage in trial and error and be creative in their actions, a process which is enabled through feelings of psychological safety. Research has shown that relational coordination, a manifestation of high-quality relationships, promoted perceptions of psychological safety, which, in turn, resulted in learning from failures in the workplace (Carmeli and Gittell, in press). When people feel they have high-quality relationships with others in the workplace, their feelings of psychological safety are enhanced. Within such an environment, individuals feel that they both possess a 'stock' of goodwill in their relationship, and are also prepared to take risks without fearing they might endanger the relationship or subject it to irreversible damage. As such high-quality relationships in the workplace are regenerative (Dutton and Heaphy, 2003) and develop psychological safety, which, in turn, further facilitates learning processes in organizations. Thus, we propose the following hypothesis:

Hypothesis 3: Psychological safety mediates the relationship between high-quality relationships and learning behaviours.

METHOD

Respondents and Data Collection

Two hundred and thirty-five undergraduate and graduate students of academic institutions were asked to participate in this study. Participants were asked to complete a structured survey at two points in time, with a lag of about three weeks between Times 1 and 2. The reason for collecting data at two points in time was to mitigate common method bias associated with cross-sectional design studies where data are collected at one point in time (Podsakoff *et al.*, 2003). The questionnaires were completed by the respondents during class time. At Time 1 we collected data about HQRs while at Time 2 we collected data about psychological safety and learning behaviours. One of the researchers attended the class, briefly presented the subject of the study and handed out the questionnaires. The average time for completing this questionnaire was 15–20 min. To correlate the same respondent's completed questionnaires from Times 1 and 2, and to preserve the respondent's confidentiality, we asked respondents to indicate the names of their maternal grandparents. All respondents were part-time students, employed in different organizations.

Two hundred and twelve students completed the two surveys, representing a response rate of 90 per cent. As such, we obtained data from people working in 212 organizations. These organizations operate in a wide variety of industries (e.g. electronics, energy, communication, banking, defence, insurance, construction, healthcare (pharmaceutical and medical equipment), textile, consultation, food and beverage, tourism and airline). Forty-one per cent of the respondents were female. Fifty-five per cent were married. The respondents' average age was 31.24 years (SD, 6.70), and their average tenure within the organization was 5.62 years (SD, 5.82). Ninety-two of the respondents held non-managerial positions, 40 held line management positions, 60 held middle-level managerial positions and 20 held senior executive positions. Twenty-five per cent of the participants held a high school diploma or equivalent, 68.4% held a Bachelor's degree, while the remainder of the participants held an MA degree or above. The

Appendix presents all measurement items for the research variables.

Perceived Learning Behaviours
This measure used the seven-point Likert scale developed and applied by Edmondson (1999). Participants were asked to assess the level of workplace learning behaviours on a seven-point scale (1 = not at all to 7 = extremely). Sample items included: 'we regularly take time to figure out ways to improve our work processes' and 'in this organization, someone always makes sure that we stop to reflect on the organization's work process'. The Cronbach's α for this measure was 0.85, similar to the reliability of 0.84 obtained by observers' ratings of team learning behaviours reported in Edmondson's (1999) study.

Psychological Safety
This measure assesses the extent to which a member in an organization feels psychologically safe to take risks, speak up and discuss issues openly. Following the results of a factor analysis, we adopted five items from Edmondson's (1999) psychological safety scale. Sample items are: 'it is difficult to ask other members of this organization for help' (reversed), and 'members of this organization are able to bring up problems and tough issues'. Items were all anchored on a seven-point scale ranging from 1 = strongly disagree to 7 = strongly agree. The Cronbach's α for this measure was 0.78, similar to the reliability of 0.82 reported in Edmondson's (1999) study. We ran a factor analysis on all items, which constituted both the psychological safety and learning behaviours measures. This procedure produced a two-factor model. The first factor, comprised of learning behaviours (eigenvalue = 3.75), had factor loadings ranging from 0.53 to 0.78. The second factor, comprised of psychological safety (eigenvalue = 2.88), had factor loadings ranging from 0.62 to 0.76. These two factors explained 31.23 and 23.99% of the variance, respectively.

High-quality Relationships
To construct our measures, we drew on Dutton's (2003a) and Dutton and Heaphy's (2003) conceptualization of the concept of high-quality relationships. As mentioned above, Dutton and Heaphy (2003) describe three capacities that

distinguish a high-quality relationship: (1) higher emotional carrying capacity; (2) relationship tensility or the capacity of the relationship to bend and withstand strain and (3) degree of connectivity. They also identify two subjective experiences that define being in a high-quality relationship: (1) a sense of positive regard and (2) feelings of mutuality. In this study, we generally followed this conceptualization, adding some extensions and modifications. We also assessed the fit of a second-order model of high-quality relationships consisting of two lower order constructs: capacity of HQRs (which are composed of three latent variables: higher emotional carrying capacity, relationship tensility and the element of openness in the connectivity dimension (labelled hereafter as connectivity)) and experiences of HQRs (which are composed of two latent variables: a sense of positive regard and feelings of mutuality).

We adapted 20 items from the scale developed by Carmeli (in press) to assess the various manifestations of high-quality relationships. Specifically, we used five items for measuring emotional carrying capacity, four items for tensility, four items for the openness-based connectivity of a high-quality relationship, three items for a sense of positive regard and four items for mutuality constituting the subjective experience of a high-quality relationship. We measured responses on a five-point scale (1 = not at all to 5 = extremely). To assess the validity of these scales, all items underwent factor analysis. The results of a confirmatory factor analysis (CFA) of the second-order model of the two latent variables indicate a reasonable fit with the data. The analysis indicates a χ^2 of 374.6 on 168 degrees of freedom, and other goodness-of-fit statistics (CFI = .88; RMSEA = .07). We also tested an alternative second-order model of one latent variable composed of five latent variables. A χ^2 of 427.7 on 167 degrees of freedom, and other goodness-of-fit statistics (CFI = .85; IFI = .85; NFI = .78; RFI = .72; TLI = .81; RMSEA = .09) were obtained. These results support a second-order model consisting of two latent variables (lower order constructs) that capture the important dimensions of high-quality relationships. The reliabilities of emotional carrying capacity, tensility, connectivity, positive

regard and mutuality were .72, .77, .83, .84 and .85, respectively.

Control Variables

We controlled for gender differences (1 = Female, 0 = Male), age and tenure in the organization.

Data Analysis

We employed structural equation modelling (SEM) (Bollen, 1989) using AMOS 5 (Arbuckle, 2003) to test the research model presented in Figure 1. In order to assess the fit of the research model, we used several goodness-of-fit indices as suggested in the SEM (Joreskog and Sorbom, 1993; Kline, 1998), such as χ^2 statistics divided by the degree of freedom (χ^2/df); Relative fit index (RFI), normed fit index (NFI), comparative fit index (CFI), Tucker–Lewis coefficient (TLI) and root mean square error of approximation (RMSEA). As suggested by the SEM literature (Joreskog and Sorbom, 1993; Kline, 1998), we used the following criteria for goodness-of-fit indices to assess the model-fitting: χ^2/df ratio is recommended to be less than 3; the values of RFI, NFI, CFI and TLI are recommended to be greater than .90; RMSEA is recommended to be up to .05, and acceptable up to .08.

RESULTS

The means, standard deviations and correlations among the research variables are presented in Table 1.

The analysis utilized the two-step approach to SEM (Bollen, 1989) as outlined in Anderson and Gerbing (1988), and recommended by others (e.g. Medsker *et al.*, 1994; Hoyle and Panter, 1995). We first tested the fit of a CFA model to the observed data. Next, we compared a sequence of nested structural models to yield information concerning the structural model that best accounts for the covariances observed between the model's exogenous and endogenous constructs (Anderson and Gerbing, 1988).

Confirmatory Factor Analysis

Prior to testing the model's hypotheses, we sought to show evidence of the construct validity
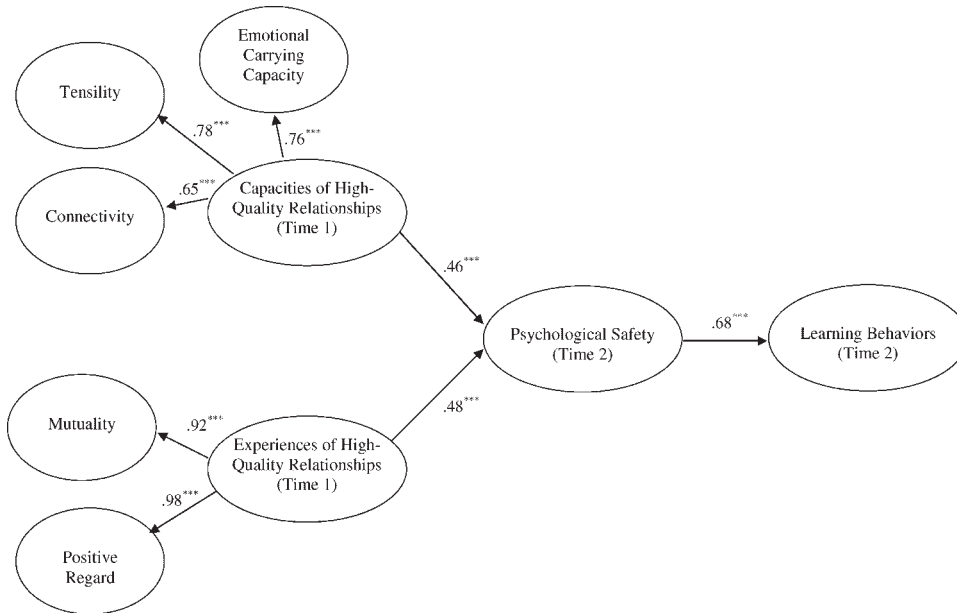
Figure 1. The research model: estimated relationships between high-quality relationships, psychological safety and learning behaviours

of the exogenous and endogenous variables. Using CFA, a second-order measurement model was tested to assess whether each of the measurement items would load significantly onto the scales with which they were associated. The results of the overall CFA showed acceptable fit with the data; a χ^2 of 903.2 on 462 degrees of freedom, and other goodness-of-fit statistics (RMSEA = .06) were obtained. Standardized coefficients from items to factors ranged from .51 to .85. In addition, the results for the CFA indicated that the

relationship between each indicator variable and its respective variable was statistically significant ($p < .01$), establishing the posited relationships among indicators and constructs, indicating convergent validity (see Hair *et al.*, 1998, p. 652). The correlation coefficients among the independent, mediating and dependent variables did not exceed a value of 0.61, suggesting that the multicolinearity among the research variables was probably not severe (Nunnaly, 1978; Belsley *et al.*, 1980; Tabachnick and Fidell, 1996).

Table 1. Means, standard deviations (SD) and correlations

	Mean	SD	1	2	3	4	5	6
Gender (1 = female)	—	—						
Age	31.24	6.70	.27***					
Tenure in the organization	5.62	5.82	.16*	.73***				
Capacities of HQRs	3.38	0.52	.08	.03	.03			
Experiences of HQRs	3.69	0.67	.06	.08	.08	.63***		
Psychological safety	5.17	0.94	.05	.12	.09	.59***	.61***	
Learning behaviours	3.12	0.82	.10	.18*	.16	.33***	.44***	.61***

$N = 212$, two-tailed test. HQRs denote high-quality relationships. Capacity of HQRs and experiences of HQRs are treated as a lower order, single dimensional constructs in this table so as to compute their correlation with the other variables.
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Following previous research (Bagozzi and Phillips, 1982; Shook *et al.*, 2004) indicating the need to examine the discriminant validity of related concepts, we assessed whether high-quality relationships and psychological safety are distinct by conducting 'pairwise tests' using CFA. The results of a one-factor solution showed poor fit with the data (a χ^2 of 897.6 on 304 degrees of freedom and RMSEA = .096), compared to a three-factor solution that had a better fit with the data (a χ^2 of 603.2 on 297 degrees of freedom and RMSEA = .07). Thus, the findings of this procedure provide support for the discriminant validity of these two constructs.

Test of Research Model and Hypotheses

We used SEM (Bollen, 1989) to estimate the research model as it enables the estimation of multiple associations, incorporation of simultaneously observed and latent constructs in these associations and it accounts for the biasing effects of random measurement error in the latent constructs (Medsker *et al.*, 1994; Shook *et al.*, 2004). The research model was tested based on the results of a second-order confirmatory analysis on all the items of the independent, mediating and dependent research variables. In this model, which is shown in Figure 1, the ovals represent latent variables. For clarity, the latent indicators are not shown in Figure 1, but it does present the standardized regression coefficients.

Figure 1 displays the model's results. The overall fit of the model was good. A χ^2 of 779.4 on 459 degrees of freedom, and other goodness-of-fit statistics (CFI = .87; RMSEA = .05) indicated that the model fit the data well. The multiple squared correlation coefficients (R^2s) for psychological safety and learning behaviours were .45 and .46, respectively.

Using SEM, we tested the mediating effect of psychological safety on the relationship between high-quality relationships and learning behaviours. This decision was based on a recent review by Schneider *et al.* (2005) who indicated the inappropriateness of the Baron and Kenny (1986) approach for testing full mediation. In addition, MacKinnon *et al.* (2002) noted that a

simultaneous test of the significance of both the path from an initial variable to a mediator and the path from the mediator to an outcome best balances type I error rates and statistical power, relative to other approaches.

The findings indicate that both the capacity of high-quality relationships and the experiences of high-quality relationships (independent variables) were positively related to psychological safety (.46, $p < .001$; .48, $p < .001$, respectively), in support of Hypothesis 1. To assess a full mediation, we specified the mediator in the model. We found support for Hypothesis 2, which predicted a positive relationship between psychological safety and learning behaviours (.71, $p < .001$).

To further test a full meditation when the psychological safety (mediator) was specified, we found (1) that the relationship between the capacity of high-quality relationships and learning behaviours was not significant (.06, $p > .10$); (2) that experiences of high-quality relationships and learning behaviours was significant related (.35, $p < .01$) and (3) the effect of psychological safety on learning behaviours remained significant and positive (.68, $p < .001$). In other words, our analyses indicate that the capacities of high-quality relationships indirectly (through psychological safety) affect learning behaviours, and that experiences of high-quality relationships have both direct and indirect effects (through psychological safety) on learning behaviours. This finding provides partial support for Hypothesis 3, which posits that psychological safety will mediate the relationship between both the capacity and experiences of high-quality relationships and learning behaviours. Therefore, we ran a revised model in which psychological safety mediated only the relationship between the capacities of high-quality relationships and learning behaviours, and partially mediated the relationship between experiences of high-quality relationships and learning behaviours. The findings, which are shown in Figure 2, indicate that (1) both the capacity of high-quality relationships and experiences of high-quality relationships (independent variables) were positively related to psychological safety (.46, $p < .001$; .48, $p < .001$, respectively), in support of Hypothesis 1; (2) a
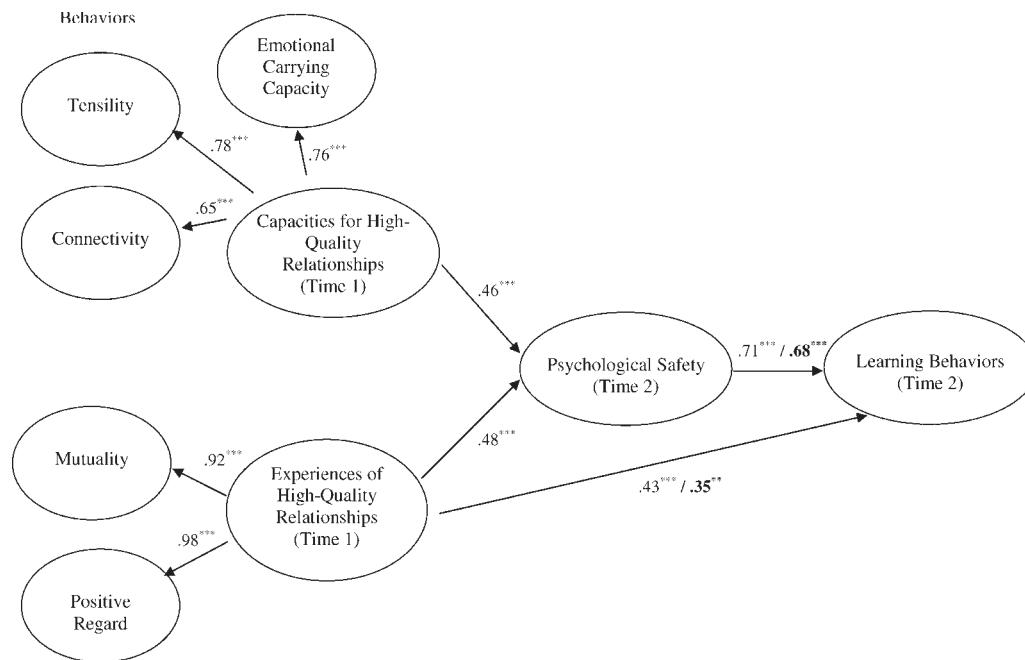
Figure 2. The revised model: estimated relationships between high-quality relationships, psychological safety and learning behaviours

positive relationship between psychological safety and learning behaviours was found (.71, $p < .001$), in support of Hypothesis 2 and (3) when the mediator was specified, the relationship between capacity of high-quality relationships and learning behaviours was not significant ($p > .10$), while the experiences of high-quality relationships variable remained positively and significantly related to learning behaviours (.35, $p < .01$). These findings indicate that psychological safety partially mediated the effect of experiences of high-quality relationships on learning behaviours, whereas it fully mediated the relationship between the capacity of high-quality relationships and learning behaviours.

work organizations. The findings suggest that positive work relationships are a key relational mechanism that contributes to perceptions of psychological safety and learning behaviours in work organizations. Specifically, we found that both the capacities built into high-quality relationships and people's subjective experiences of being in this form of relationship separately, and in combination, were associated with a sense of psychological safety. However, whereas psychological safety fully mediated the link between relationships' capacities and learning behaviours, there were both direct and indirect (through psychological safety) associations between subjective experiences and learning behaviours. The study makes several theoretical contributions and has managerial implications.

DISCUSSION

In this study, we attempted to provide a preliminary response to the question of whether high-quality relationships facilitate psychological safety and expand the capacity for learning in

Theoretical Contributions

From a theoretical perspective, this study contributes to a better understanding of the relational

mechanisms that cultivate psychological safety and learning behaviours. Specifically, our research underscores the importance of high-quality relationships as a possible enabler to psychological safety and learning behaviours.

Second, the results suggest that psychological safety is tied to the way people feel and act in relationships with one another. Both the functional capacities of high-quality relationships (the carrying capacity, tensility and connectivity), as well as how individuals experience these bonds (mutuality and positive regard) are associated uniquely with a sense of interpersonal safety, which itself is associated with the perception of more extensive learning behaviours. Theoretically the study adds detail to the relational mechanisms that undergird learning behaviours, and it empirically supports the value of treating unique aspects of relationships differently. The fact that the functional capacities of high-quality relationships were fully mediated by psychological safety suggests that what relationships do when in connection with others may be more important than how relationships feel in accounting for a heightened sense of psychological safety and more extensive learning.

Our study addresses the call from Edmondson (2004) to more thoroughly explore the origins of psychological safety in the workplace by considering how features of interpersonal relationships are tied to psychological safety. In addition, our paper contributes to the call for directing increased effort and attention to learning as a social process and the need to examine the relational underpinning of this crucial process inside organizations (Kozlowski and Ilgen, 2006; Uzzi and Lancaster, 2003). Furthermore, our research provides a closer look into the conceptualization of learning as a relational process (Kozlowski and Ilgen, 2006; Kozlowski and Bell, 2007) by examining the substantive relational ties between members and the way the latter may facilitate or impede learning processes in organizations.

While researchers have argued that high-quality relationships matter for important organizational outcomes such as collaboration and learning (Dutton and Heaphy, 2003; Dutton, 2003b), the mechanisms underlying these relationships have not been empirically validated. How-

ever, this study suggests that psychological safety may be a key intervening variable for the relationship between high-quality interpersonal relationships and learning behaviours, helping researchers better understand how the quality of relationships shapes workplace behaviour. Nevertheless, because psychological safety did not fully mediate the effect of experiences of high-quality relationships on learning, there may be additional mechanisms to explore to explain how the quality of interpersonal relationships fosters learning. For example, Gittell (2003) argued and demonstrated empirically that high-quality relationships are associated with patterns of communication that foster performance and efficiency in the context of coordination. Her work suggests that it is important to examine how high-quality relationships affect and are affected by the frequency, timeliness, accuracy and problem-solving nature of communication. A very different theoretical route would be to explore how high-quality relationships physiologically strengthen individuals, resulting in a very different kind of resourcefulness that could contribute to more extensive learning behaviours (Heaphy and Dutton, 2008).

Finally, our empirical work extends and validates the operationalization of high-quality relationships (Dutton and Heaphy, 2003), psychological safety (Edmondson, 1999, 2002) and learning behaviours (Edmondson, 1999, 2002). Increasing confidence in these measures may help future research address the recognized problem that relatively 'few attempts have been made to gather quantitative measures of positive organizational phenomena' (Cameron and Caza, 2004, p. 733; see also Youssef and Luthans, 2007). Furthermore, our study focused on relationship quality and allowed us to provide a more precise specification of how features of relational ties between organizational members contribute to psychological safety and learning behaviours. In doing so, we also contributed to a broader line of thinking that underscores the relational foundation of capabilities that enable better organizing in work settings (mindfulness, compassion, healing and downsizing) (e.g. Weick and Roberts, 1993; Dutton *et al.*, 2006; Gittell *et al.*, 2006; Powley and Cameron, 2006; Vogus, 2007).

Managerial Implications

Dynamic learning is a vital process for organizational and individual thriving and success (Spreitzer *et al.*, 2005). The literature on high-quality relationships may help managers facilitate and support processes of learning by encouraging structures and processes that foster high-quality interpersonal relationships. For example, Baker and Dutton (2007) identify five clusters of practices that facilitate the building of high-quality relationships. Illustrative practices include selecting employees on the basis of relational skills, participatory selection processes, relational socialization practices, rewarding for relational skills and using relational meeting practices. Consideration of these practices makes managers mindful that high-quality relationships do not spontaneously happen; however, normal work practices can enable or disable the building of this kind of relational fabric which is conducive to a sense of psychological safety and a capacity for learning.

A different set of implications arise if we consider how leadership behaviours and processes contribute to the building and sustaining of high quality relationships, which in turn, contribute to learning behaviour. For example, leaders may model forms of interpersonal interrelating which could enhance of diminish the building of high quality relationships. As Fletcher (2007, p. 359) suggests, 'leaders affect the relational climate of an organization by modelling relational behaviour'. Leaders also can engage in particular forms of interacting with subordinates that create high quality relationships more directly and which contribute to an increase in organizational members' desires for more interpersonal connections (Fletcher, 2007). As a result, leadership behaviours can directly and indirectly influence learning behaviours through their impact on an increased desire and a capacity for high quality relationships.

Limitations and Suggestions for Future Research

Important questions about interpersonal workplace relationships still need to be answered. For example, we still know very little about how high-quality relationships are created in organizations. Future research could address ways to create these types of relationships, and to differentiate the relative impact of high-quality relationships as compared to other types of relational variables (e.g. trust, social support and affection) in explaining variation in psychological safety. We also emphasized that interpersonal relationships are life-giving or life-depleting, but high-quality relationships, like other concepts (e.g. organizational identification, *cf*. Kreiner and Ashforth, 2004) can take many forms, including being neutral or even ambivalent. Future studies would benefit from careful examination of the emergence of relationship forms and their consequences and outcomes. We also note that we have not examined relationship vitality which is another manifestation of experiences of high quality relationships. Future research may benefit from assessing how perceived vitality in relationships contributes to psychological safety and learning behaviours in work organizations. In addition, it is imperative to consider relationships with different kinds of work colleagues (managers, co-workers and customers) and their influence on both psychological safety and learning behaviours in organization. For instance, one could enjoy high-quality relationships with co-workers but experience low-quality or corrosive relationships with a boss or manager; these may have implications for both psychological safety and learning in organizations. Finally, future research could focus on the implications of learning behaviours on organizational outcomes, employing performance measures at the organizational level.

We used structured surveys to collect the data. Although we pre-tested our measures and researchers have recently noted there is little evidence that common method variance exists (Spector, 2006) we realize the potential limits that arise from a study relying on single-respondents and self-report data. We attempted to mitigate the potential bias and common method errors by collecting data at two time points (Podsakoff *et al.*, 2003). In addition, we used respondents' assessments to report on relationships, psychological safety and learning behaviours in the

organization as a whole, rather than asking questions about their own beliefs or attitudes. We ran a factor analysis on the items constituting our measures and no one factor emerged. Finally, following previous research (Bagozzi and Phillips, 1982; Shook *et al.*, 2004), the results, as described above, of 'pairwise tests' using CFA of two related concepts (high-quality relationships and psychological safety) indicate that these concepts are distinct. These are encouraging and suggest that common method variance, though it cannot be entirely ruled out, may not be severe in the current study, but much work remains to be done. Although we rely on a scale that was developed in a previous work for measuring high-quality relationships, we think that it is important to invite attempts to further revise and refine it.

In this study, we proposed a specific theoretical order from high-quality relationships to psychological safety, to learning. One might argue that the causal impact of our variables works in the opposite direction to what we tested. For example, it may be that an interpersonal context that feels psychologically safe encourages and enables the building of more high-quality relationships. Theoretically, we believe that high-quality relationships help in developing psychological safety. However, these relationships might reinforce one another, and with the current sample data we cannot make inferences of causality. Future research that deploys a more carefully controlled longitudinal design could explore these important questions of causality. In addition, we used a convenience sample of students and this might have affected our results, decreasing our ability to generalize the findings. Future studies should test these relationships using a random sample of employees surveyed in the workplace. In addition, we examined only two aspects of subjective experience of being in a relationship—positive regard and mutuality—but not vitality emerging from relationships. Future studies might benefit from incorporating all three relational dimensions. Finally, it seems important to inquire about other, possibly unobserved, variables that foster psychological safety and learning behaviours at work. Though we have made a substantial effort to explain the importance of high-quality

relationships for the development of psychological safety and enhancing learning behaviours, more research is needed to extend the set of explanatory variables, and simultaneously estimate the effect on learning behaviours.

CONCLUSION

Consistent with the call for more relational theories in sociology (Emirbayer, 1997) and psychology (Berscheid, 1999), our study affirms the importance of relational underpinnings in an organization for the scaffolding of key organizational capabilities such as learning. Our hope is that the empirical results from this study will invite further exploration of how high-quality relationships, in conjunction with other relational constructs (e.g. trust and liking), create a relational foundation for other capabilities that are central to generating positive change and enhancing performance of organizations. This type of inquiry will help to open up meaningful synergies between strategy researchers' interests in the creation of capabilities that foster competitive success, and organizational behaviourists' interests in the interpersonal dynamics that create contexts for human performance in the workplace.

REFERENCES

Arbuckle JL. 2003. *Amos 5.0 Update to the Amos User's Guide*. Smallwaters Corporation: Chicago, IL.

Argote L. 1999. *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Kluwer Academic: Boston.

Argote L, Gruenfeld D, Naquin C. 2001. Group learning in organizations. In *Groups at Work: Advances in Theory and Research*, Turner ME (ed.). Lawrence Erlbaum Associates: Mahway, NJ; 369–411.

Argyris C. 1977. Double loop learning in organizations. *Harvard Business Review* **55**: 115–125.

Argyris C, Schoen DA. 1978. What is an organization that it may learn? In *Organizational learning: A theory perspective*, Argyris C, Schoen DA (eds). Addison-Wesley: Reading, MA; 8–29.

Bagozzi R, Phillips LW. 1982. Representing and testing organizational theories: a holistic construal. *Administrative Science Quarterly* **27**: 459–489.

Baker W, Dutton JE. 2007. Enabling positive social capital in organizations. In *Exploring Positive*

Relationships at Work: Building a Theoretical and Research Foundation, Dutton J, Ragins B (eds). Lawrence Erlbaum Associates: Mahway, NJ; 325–346.

Baron RM, Kenny DA. 1986. The moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology* **51**: 1173–1182.

Belsley DA, Kuh E, Welsch R. 1980. *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*. John Wiley & Sons: New York.

Berscheid E. 1999. The greening of relationship science. *American Psychologist* **54**: 260–266.

Bollen KA. 1989. *Structural Equations with Latent Variables*. Wiley: New York.

Brown JS, Duguid P. 2000. *The Social Life of Information*. Harvard Business School Press: Boston, MA.

Cameron KS, Caza A. 2004. Contributions to the discipline of positive organizational scholarship. *American Behavioral Scientist* **47**: 731–739.

Cameron KS, Whetten DA. 1981. Perceptions of organizational effectiveness across organizational life cycles. *Administrative Science Quarterly* **27**: 524–544.

Cannon MD, Edmondson AC. 2001. Confronting failure: antecedents and consequences of shared beliefs about failure in organizational work groups. *Journal of Organizational Behavior* **22**: 161–177.

Carmeli A. 2007. Social capital, psychological safety and learning behaviours from failure in organisations. *Long Range Planning* **40**: 30–44.

Carmeli A. High-quality relationships, individual aliveness and vitality, and job performance at work. In *Research on Emotion in Organizations*, Vol. 5, Ashkanasy N, Zerbe WJ, Härtel CEJ (eds). Oxford UK, Elsevier JAI Press.

Carmeli A, Gittell JH. in press. High quality relationships, psychological safety and learning from failures in work organizations. *Journal of Organizational Behavior*.

Choi JN. 2006. Multilevel and cross-level effects of workplace attitudes and group member relations on interpersonal helping behavior. *Human Performance* **19**: 383–402.

Cohen W, Levinthal D. 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly* **35**: 128–152.

Dewey J. 1986. *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. D.C. Heath and Company: Lexington, MA.

Dodgson M. 1993. Learning, trust, and technological collaboration. *Human Relations* **46**: 77–94.

Dutton JE. 2003a. Fostering high-quality relationships. *Stanford Social Innovation Review* (Winter), 54–57.

Dutton JE. 2003b. *Energize Your Workplace: How to Build and Sustain High-Quality Relationships at Work*. Jossey-Bass: San Francisco, CA.

Dutton JE, Heaphy ED. 2003. The power of high-quality relationships at work. In *Positive Organizational Scholarship*, Cameron KS, Dutton JE, Quinn RE (eds). Berrett-Koehler Publishers: San Francisco; 263–278.

Dutton JE, Ragins BR. 2007. Moving forward: positive relationships at work as a research frontier. In *Exploring Positive Relationships at Work: Building a Theoretical and Research Foundation*, Dutton JE, Ragins BR (eds). Lawrence Erlbaum Associates: Mahwah, NJ; 387–400.

Dutton JE, Worline M, Frost P, Lilius J. 2006. Explaining compassion organizing. *Administrative Science Quarterly* **51**: 59–96.

Edmondson AC. 1996. Learning from mistakes is easier said than done: group and organization influences on the detection and correction of human error. *Journal of Applied Behavioral Science* **32**: 5–28.

Edmondson AC. 1999. Psychological safety and learning behavior in work teams. *Administrative Science Quarterly* **44**: 350–383.

Edmondson AC. 2002. The local and variegated nature of learning in organizations: a group-level perspective. *Organization Science* **13**: 128–146.

Edmondson AC. 2004. Psychological safety, trust, and learning in organizations: a group-level lens. In *Trust and Distrust in Organizations: Dilemmas and Approaches*, Kramer RM, Cook KS (eds). Russell Sage Foundation: New York; 239–272.

Elkjaer B. 2003. Social learning theory: learning as participation is social processes. In *The Blackwell Handbook of Organizational Learning and Knowledge Management*, Easterby-Smith M, Lyles MA (eds). Blackwell Publishing Ltd: Malden, MA; 38–53.

Emirbayer M. 1997. Manifesto for a relational sociology. *American Journal of Sociology* **103**: 281–317.

Fletcher JK. 2007. Leadership, power and positive relationships. *Exploring Positive Relationships at Work: Building a Theoretical and Research Foundation*, Dutton JE, Ragins BR (eds). Lawrence Erlbaum Associates: Mahwah, NJ; 347–373.

Frawley-O'Dea MG, Sarnat JE. 2001. *The Supervisory Relationship: A Contemporary Psychodynamic Approach*. Guilford: New York.

Gherardi S, Nicolini D, Odella F. 1998. Toward a social understanding of how people learn in organizations: the notion of situated curriculum. *Management Learning* **29**: 273–298.

Gittell JH. 2003. A theory of relational coordination. In *Positive Organizational Scholarship*, Cameron KS, Dutton JE, Quinn RE (eds). Berrett-Koehler Publishers: San Francisco; 279–295.

Gittell JH, Cameron KS, Lim S, Rivas V. 2006. Relationships, layoffs and organizational resilience: airline responses to crisis of September 11th. *Journal of Applied Behavioral Science* **42**: 300–329.

Hair JF, Anderson RE, Tatham RL, Black WC. 1998. *Multivariate Data Analysis*. Prentice-Hall: Upper Saddle River, NJ.

Heaphy ED, Dutton JE. 2008. Positive social interactions and the human body at work: linking organ-

izations and physiology. *Academy of Management Review* **33**: 137–162.

Hoyle RH, Panter AT. 1995. Writing about structural equation models. In *Structural Equation Modeling: Concepts, Issues and Applications*, Hoyle RH (ed.). Sage: Thousand Oaks, CA; 158–176.

Jordan JV. 1991. The meaning of mutuality. In *Women's Growth in Relationship: Writings from the Stone Center*, Jordan JV, Kaplan AG, Miller JB, Stiver IP, Surrey JL (eds). Guilford: New York; 81–96.

Joreskog KG, Sorbom D. 1993. *LISREL 8: Structural Equation Modeling with the SIMPLIS Command Language*. Scientific International Software: Chicago, IL.

Kahn WA. 1990. Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal* **33**: 692–724.

Kahn WA. 2001. Holding environments at work. *Journal of Applied Behavioral Science* **37**: 260–279.

Kellogg KC, Orlikowski WJ, Yates J. 2006. Life in the trading zone: structuring coordination across boundaries in postbureaucratic organizations. *Organization Science* **17**: 22–44.

Kozlowski SWJ, Bell BS. 2007. Team learning, development, and adaptation. In *Work Group Learning: Understanding, Improving and Assessing how Groups Learn in Organizations*, Sessa VI, London M (eds). Erlbaum: Mahwah, NJ; 15–44.

Kozlowski SWJ, Ilgen DR. 2006. Enhancing the effectiveness of work groups and teams. *Psychological Science* **7**: 77–124.

Kline RB. 1998. *Principles and Practice of Structural Equation Modeling*. The Guilford Press: New York.

Kreiner GE, Ashforth BE. 2004. Evidence toward an expanded model of organizational identification. *Journal of Organizational Behavior* **25**: 1–27.

Lee F, Caza A, Edmondson A, Thomke S. 2003. New knowledge creation in organizations. In *Positive Organizational Scholarship*, Cameron KS, Dutton JE, Quinn RE (eds). Berrett-Koehler Publishers: San Francisco, CA; 194–206.

Lee F, Edmondson A, Thomke S, Worline M. 2004. The mixed effects of inconsistency on experimentation in organizations. *Organization Science* **15**: 310–326.

Lewin R, Regine B. 2000. *The Soul at Work*. Simon & Schuster: New York.

Losada M. 1999. The complex dynamics of high performance teams. *Mathematical and Computer Modeling* **30**: 179–192.

Losada M, Heaphy E. 2004. The role of positivity and negativity in the performance of business teams. *The American Behavioral Scientist* **47**: 740–765.

MacKinnon DP, Lockwood CM, Hoffman JM, West SG, Sheets V. 2002. A comparison of methods to test mediation and other intervening variables effects. *Psychological Methods* **7**: 83–104.

Medsker GJ, Williams LJ, Holahan PJ. 1994. A review of current practices for evaluating causal models in organizational behavior and human resources management research. *Journal of Management* **20**: 439–464.

Miller JB, Stiver IP. 1997. *The Healing Relationship: How Women form Relationships in Therapy and in Life*. Beacon Press: Boston, MA.

Nair KU. 2001. Adaptation to creation: progress of organizational learning and increasing complexity of learning systems. *Systems Research and Behavioral Science* **18**: 505–521.

Nunnaly JC. 1978. *Psychometric Theory* (2nd edn). McGraw-Hill: New York.

Podsakoff PM, MacKenzie SB, Lee J, Podsakoff NP. 2003. Common method bias in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology* **88**: 879–903.

Powley EH, Cameron KS. 2006. Organizational healing: lived virtuousness amidst organizational crisis. *Journal of Management, Spirituality, & Religion* **3**: 13–33.

Quinn RE, Quinn GT. 2002. *Letters to Garrett: Stories of Change, Power and Possibility*. Jossey-Bass: San Francisco.

Ragins BR, Dutton JE. 2007. Positive relationships at work: an introduction and invitation. In *Exploring Positive Relationships at Work: Building a Theoretical and Research Foundation*, Dutton J, Ragins B (eds). Lawrence Erlbaum Associates: Mahway, NJ; 1–25.

Raghuram S, Garud R, Wiesenfeld B. 2001. Factors contributing to virtual work adjustment. *Journal of Management* **27**: 383–405.

Rogers CR. 1951. *Client-Centered Therapy*. Houghton Mifflin: Boston.

Schneider B, Ehrhart MG, Mayer DM, Saltz JL, Miles-Jolly K. 2005. Understanding organization-customer links in service settings. *Academy of Management Journal* **48**: 1017–1032.

Shook CL, Ketchen DJ, Hult GTM, Kacmar KM. 2004. An assessment of the use of structural equation modeling in strategic management research. *Strategic Management Journal* **25**: 397–404.

Spector PE. 2006. Method variance in organizational research: truth or urban legend? *Organizational Research Methods* **9**: 221–232.

Spreitzer GM, Sutcliffe K, Dutton JE, Sonenshein S, Grant AM. 2005. Enabling human thriving at work: a process model of human growth in organizations. *Organization Science* **16**: 537–549.

Tabachnick BG, Fidell LS. 1996. *Using Multivariate Statistics*. Harper Collins College Publishers: New York.

Thompson JD. 1967. *Organizations in Action: Social Science Bases of Administrative Theory*. McGraw-Hill: New York.

Uzzi B, Lancaster R. 2003. Relational embeddedness and learning: the case of bank loan managers and their clients. *Management Science* **49**: 383–399.

Vogus TJ. 2007. The Structural and Relational Bases of Mindful Organizing. *Working paper*, Vanderbilt Univeristy.

Wageman R. 1995. Interdependence and group effectiveness. *Administrative Science Quarterly* **40**: 145–180.

Walsh BB, Gillespie CK, Greer JM, Eanes BE. 2002. Measure of dyadic mutuality on counselor trainee willingness to self-disclose clinical mistakes to supervisors. *The Clinical Supervisor* **21**: 83–98.

Weick KE, Roberts K. 1993. Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly* **38**: 357–381.

Wiesenfeld BM, Raghuram S, Garud R. 2001. Organizational identification among virtual workers: the role of need for affiliation and perceived work-based social support. *Journal of Management* **27**: 213–229.

Youssef CM, Luthans F. 2007. Positive organizational behavior in the workplace: the impact of hope, optimism, and resilience. *Journal of Management* **33**: 774–800.

Zander RS, Zander B. 2000. *The Art of Possibility: Transforming Professional and Personal Life*. Harvard Business School Press: Cambridge, MA.

APPENDIX: MEASUREMENT ITEMS

High-quality relationships

Emotional carrying capacity
    My co-workers and I do not have any difficulty expressing our feelings to each other
    We are not afraid to express unpleasant feelings at work
    Whenever anyone at work expresses an unpleasant feeling, she/he always does so in a constructive manner
    If someone gets upset with other co-workers, she/he knows they will try to understand her/him
    I am able to express my frustrations without offending anyone
Tensility
    We cope well with the conflicts we experience at work
    We cope well with the tensions we experience at work
    We cope well with the pressures experienced at work
    Even during times of stress and pressure, we always manage to find effective solutions
Connectivity
    We are always open to listening to our co-workers' new ideas
    We are very open to diverse influences, even if they come from unconventional sources, such as new employees, customers, etc.
    We are attentive to new opportunities that can make our system more efficient and effective
    We know how to accept people who are different
Positive regard
    I feel that my co-workers like me
    I feel that my co-workers and I try to develop meaningful relationships with one another
    I feel that my co-workers understand me
Mutuality
    The relationship between my co-workers and myself is based on mutuality
    We are committed to one another at work
    There is a sense of empathy among my co-workers and myself
    I feel that my co-workers and I do things for one another
    Psychological safety (source: Edmondson, 1999)
    Members of this organization are able to bring up problems and tough issues
    People in this organization sometimes reject others for being different
    It is difficult to ask other members of this organization for help
    No one in this organization would deliberately act in a way that undermines my efforts
    Working with members of this organization, my unique skills and talents are valued and utilized
Learning behaviours (source: Edmondson, 1999)
    We regularly take time to figure out ways to improve our organization's work processes
    This organization tends to handle differences of opinion privately or off-line, rather than addressing them directly as a work unit
    Organizational members go out and get all the information they possibly can from others, such as customers or other parts of the organization
    This organization frequently seeks new information that leads us to make important changes
    In this organization, someone always makes sure that we stop to reflect on the organization's work process
    People in this organization often speak up to test assumptions about issues under discussion
    We invite people from outside the organization to present information or have discussions with us

---

Abraham Carmeli *et al.*