Sense of coherence as influencing information sharing at the workplace

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Abstract

Purpose

This study introduces sense of coherence (SOC) as a factor in information sharing at the workplace.

Design/methodology/approach

Data were collected by a survey conducted on 311 respondents in a multinational organization and analyzed using partial least square structural equation modelling.

Findings

SOC influenced information sharing both directly and indirectly as mediated by trust and employee learning orientation. Trust, moreover, influenced receiving information more strongly than sending it, while employee learning orientation more strongly affected sending information.

Originality/value

The findings underline the importance of a holistic understanding of information sharing, including individual differences and employee well-being.

Keywords: sense of coherence; information sharing; trust; employee learning motivation

1. Introduction

Information sharing is a key asset in today´s fluid, collaborative and technology-enabled workplace. Short-term contracts, entrepreneurship and frequent career changes are becoming commonplace. Teamwork is also increasing, facilitated by technology that enables collaboration across time zones and countries (Byström, Heinström & Ruthven, 2019). These developments underline the importance of capturing individual workers' know-how and insight. There is broad consensus on the importance of information sharing as a key strategic activity for organizations (Yang and Maxwell, 2011). Information sharing leads to positive outcomes whereas non-sharing and a consequent asymmetry of information typically have a negative organizational impact (Tong and Crosno, 2015). Increased sharing also leads to a positive organizational culture (Singh and Soltani, 2010).

Information sharing is, however, a complex phenomenon that is difficult to manage effectively. Structures may facilitate sharing (Yang and Maxwell, 2011; Buunk, Smith and Hall, 2018), but its key building block is social relations (Hau et al., 2013). As an individual difference in social connectedness, sense of coherence (SOC) could provide a key to understanding information sharing. The SOC theory states that people with a strong SOC can interpret messages from their environment and feel heard when they have a message to convey themselves (Antonovsky, 1993). SOC is determined by (1) how connected people are to social structures from which (2) they receive information, (3) how well they can integrate information (i.e., construct knowledge) and (4) how well they transmit information back to the social structures, (5) trusting that they will receive a response (Antonovsky, 1991, 1993). Interaction, communication and information sharing, both sending and receiving, are thus essential elements in the theory. In a health context, previous research shows that the stronger SOC individuals have, the better they can handle information cognitively, emotionally and practically (Ek, 2005; Ek and Widén-Wulff, 2008; Ek and Heinström, 2011). Moreover, in an extensive population-based study, Ek (2005, pp. 74–75) found a strong positive connection between SOC and social trust, as well as between SOC and social cohesion (Ek, 2005, pp. 82–83). Few previous studies have, however, linked SOC to work-related information practices (for an exception, see Heinström & Ahmad, 2018). The aim of the present study was therefore to investigate the role of SOC in information sharing. The impact of

SOC was measured both directly and indirectly by introducing two mediating variables: a socio-emotional factor, trust (Chen et al., 2014; Wilson, 2010) and a cognitive-motivational factor, employee learning orientation (Gong, Huang and Farh, 2009).

The paper is structured as follows: section 2 presents the theory and hypothesis development and the key concepts of information sharing and SOC. The ensuing sections present the methodology, results, discussion and, finally, the conclusion.

2. **Theory and hypothesis development**

2.1. Key concepts: information sharing and sense of coherence

Workplace information sharing refers to the exchange of general day-to-day work-related information, with a focus on the activities of sharing (Savolainen, 2017). In the literature, information and knowledge sharing are sometimes used synonymously or so that one of the terms is used to refer to both. Wang and Noe (2010, p. 117) underline the seamlessness between the two concepts and define knowledge ‘as information processed by individuals including ideas, facts, expertise, and judgments relevant for individual, team, and organizational performance’. Knowledge may be regarded as ‘a set of mental processes involving understanding and learning’. When this is conveyed, ‘information about what one knows is shared’. (Wilson, 2010). Except for individual studies that make a sharp conceptual distinction, both information and knowledge sharing research describe the general activity of sharing (Pilerot, 2012; Savolainen, 2017; Wittel, 2011).

There are multiple organizational and individual factors that influence information sharing (Bigdeli et al., 2013). Organizational factors include risks, rewards and incentives (Yang and Maxwell, 2011), information culture (Widén and Steinerová, 2019), organizational rituals and norms (Yang and Maxwell, 2011), management support (Bigdeli et al., 2013) and language

diversity (Ahmad, 2018). Individual factors include personality (Matzler et al., 2011; Cui, 2017) self-efficacy (Ergün & Ümmühan, 2018), self-interest (Yang and Maxwell, 2011), perceived risks (Wilson, 2010) and own perceived expertise (Almehmadi et al., 2014). This points to the complexity of information sharing and the need for a deeper understanding of its underpinning mechanisms.

In this study, sending and receiving information were investigated separately. Sharing always involves both sending and receiving (Foss et al., 2009). A strong correlation between sending and efforts to receive has been found in previous research (Cabrera et al., 2006). Some studies, however, also identify differences (e.g., Widén et al., 2017; Foss et al., 2009; van den Hooff and de Leeuw van Weenen, 2004). Cleveland and Ellis (2015) identified time pressure as the key barrier to receiving information, while low communication skills and lack of trust inhibited sending. In a social network environment, Liu et al (2016) found that in-links had a greater impact on sending information. Some scholars, furthermore, argue that sending and receiving information is driven by different mechanisms; sending is associated with a higher cost, while receiving provides benefits (van den Hooff and de Leeuw van Weenen, 2004). In our study we regarded receiving information as the reception of information rather than the absorption of it; that is, information use. Personal characteristics, such as SOC, may not only influence a person's own behaviour, such as sending information, but also the way others interact with him/her. Colleagues are e.g. likely to be more willing to share information with an open and friendly co-worker who consequently would also receive more. A personal feeling of stress, in turn, may both prevent sending information and openness to receive it.

Sense of coherence (SOC) was developed by Aaron Antonovsky from a salutogenic perspective, aimed at understanding well-being (1979, 1987b). SOC describes a resilience to stress, which explains why some people cope well with stressors in situations which others find overwhelming. SOC consists of comprehensibility, manageability and meaningfulness. Comprehensibility suggests that a person perceives stimuli from the environment as structured, predictable and understandable. Manageability refers to the belief that one has the needed resources to deal with the challenges of life. Meaningfulness makes these challenges seem worthy of investment and engagement. Those with a strong SOC feel connected to their environment and understand the

messages they receive. They can integrate new information with their previous understanding, transform insights into action, and trust that the environment will be responsive (Antonovsky, 1993). The ability to master the information flow is an essential part of the theory. In order to view the world as meaningful and manageable, we need to cognitively process the information we encounter (Antonovsky, 1993). People with a strong SOC find that their environment makes sense, and trust that they have the needed resources to cope with challenging situations (1979, 1987b). This mindset also manifests in a work environment (Antonovsky, 1987a). A strong SOC can moderate feelings of pressure and reactions to work conditions (Jenny et al., 2017).

The direct influence of SOC on information sharing was investigated in this exploratory study. In order to account for possible mediating variables, moreover, two individual attributes that have been linked both to SOC and to information sharing were introduced to ensure that the relation between SOC and information sharing was not in fact an effect of these. The first direct link between SOC and information sharing can be found in salutogenesis (Antonovsky, 1979, 1987b), linking a strong SOC to resilience to stress, which in turn enables sharing (Bălău and Utz, 2017). The second direct link between SOC and information sharing can be found in active social interaction (Hau et al., 2013). These relations will be elaborated in the following sections. The first mediating variable was a work-related personal attribute linked both to SOC and to information sharing. Research shows that employees with a strong intrinsic motivation for work share more information at the workplace (Kim and Park, 2017). To build on this work, it was vital to include a mediating variable for intrinsic work motivation that would relate both to SOC and to information sharing. Based on a literature review, learning orientation was identified as such a variable (Pijpker et al., 2018). As information sharing is a social activity, a mediating variable for social interaction related both to SOC and to information sharing was needed. Based on a literature review, trust was identified as such a variable (Antonovsky, 1993; Zahedi et al., 2016). These relations will be elaborated in the following sections.

2.2. Sense of coherence and information sharing

Information transfer is crucial in the five-stage model underpinning the SOC theory (Antonovsky 1991, 1993). The following aspects, in order of importance, are highlighted in the model: (1) is the

self linked to, or isolated from, the environment?; (2) does the environmental input consist of information or noise?; (3) is the internal processing integrating or chaotic?; (4) is the new knowledge translated into behaviour and put into action?; and (5) is the feedback from the environment responsive or rejective? Social connectedness is, therefore, integral to a high SOC in a similar way to how social relations are also critical to information sharing (Hau et al., 2013). Social motivations (Bălău and Utz, 2017), communication skills as well as work and friendship ties (Haythornthwaite and Wellman, 1998) can affect both sending and receiving information, whereas unwillingness to share information has been explained by factors such as the fear of losing a job or competencies (Zahedi et al., 2016). People tend to send information simply because they enjoy helping others and find it meaningful per se to maintain strong social relationships built on trust, tie strength, frequency of interaction, close relationships and norms (He and Wei, 2009; Liu et al., 2016). As a socially oriented individual difference, SOC could be one factor facilitating collegial relationships and thereby information sharing. People with a strong SOC tend to be more empathetic towards others in a work context, willing to help colleagues and collaborate (Levy, Shlomo and Itzhaky, 2014). This is likely to increase sending information. People with a strong SOC also perceive communication in their work environment as free-flowing, with team spirit and solidarity which make them open to receive information (Kalimo and Vuori, 1991; Feldt, Kivimäki, Rantala and Tolvanen, 2004). Those with a weak SOC, on the other hand, often find collegial relationships challenging and non-supportive (Haoka et al., 2010).

Moreover, SOC may be linked to information sharing through well-being and lack of stress. Haoka et al. (2010) found that well-being at work was associated not only with actual working conditions, but also with attitudes towards them, as moderated by SOC. A strong SOC may prevent occupational stress and foster occupational well-being (Schäfer et al., 2018). Those with a weak SOC generally perceive that their job demands are high, whereas those with a strong SOC believe that they have the resources needed to deal with work pressure (Fourie, Rothmann and van de Vijver, 2008). Studies have also demonstrated that those with a strong SOC cope better with work-related stress (Jenny et al., 2017; Nilsen et al., 2016). A weak SOC, in turn, increases the risk for emotional exhaustion (Love et al., 2011), mental overload (Haoka et al., 2010), and burnout (Haley, Mostert and Els, 2013). Subjective well-being has been found to have a positive impact on information sharing (Chumg, Cooke & Hung, 2015; Wang,Yang & Xue, 2017). A large body of

work also points to stress and time pressure as barriers to sending information (e.g., Bălău and Utz, 2017). Lack of time also reduces efforts to receive information (Cleveland and Ellis, 2015). It is thus known that stress prevents information sharing. However, studies seldom explain what factors might lie behind the experience of stress that prevent sharing. SOC may be such a factor.

Based on the literature above, two directly relevant predispositions connecting SOC with information sharing emerge: 1) SOC as an enabler of collegial relationships and 2) SOC as resilience to stress. In turn, close relationships and low stress have been related to information sharing in the form of both sending and receiving information. These connections resulted in the first set of hypotheses:

Hypothesis 1a. SOC is positively connected to an individual's information sending.

Hypothesis 1b. SOC is positively connected to an individual's information receiving.

2.3. Sense of coherence, employee learning orientation and information sharing

Employee learning orientation has been found to be relevant for information sharing (Swift, Balkin and Matusik, 2010; Wang and Noe, 2010). Employee learning orientation is an internal drive to acquire knowledge and skills with the goal of developing work competence (Gong, Huang and Farh, 2009). People with a learning orientation adapt to, and are even attracted to, new or challenging achievement situations because they regard them as opportunities for self-improvement (Kozlowski et al., 2001). Learning orientation has been found to stimulate sending information because it may be regarded as a good learning opportunity. Explaining something to others often clarifies the employee's own understanding of the matter at hand (Swift, Balkin and Matusik, 2010; Wang and Noe, 2010). The importance of employee learning orientation in information sharing is supported by studies on similar concepts such as intrinsic motivation and work engagement (Matzler et al., 2011; Kim and Park, 2017). Intrinsic motivation (Cabrera et al., 2006) and work engagement (van den Hooff and de Leeuw van Weenen, 2004) have been found to increase both sending and receiving information.

Meaningfulness describes a sense of worth in investing time, energy and engagement in addressing life's challenges (Antonovsky, 1987b). In a work context, this can emerge as ownership of work and a drive not only to perform work tasks well, but also to excel in order to achieve power, rewards and prestige as well as intrinsic gratification (Antonovsky, 1987a). Previous work has found that instrumental and social learning orientation mediate the relation between SOC and social relations at work (Pijpker et al., 2018). Based on this work, employee learning orientation (Gong, Huang and Farh, 2009) was introduced as a mediating variable between SOC and information sharing. Instrumental and social learning are components of general workplace learning processes (Pijpker et al., 2018) while employee learning orientation goes beyond workplace learning to also include an inner drive to succeed. Previous work has linked a strong SOC to personal accomplishment at work (Love et al., 2011). It has also been found that employees with a weak SOC often gain less reward from work (Haoka et al., 2010).

This results in the second set of hypotheses:

Hypothesis 2a. The relationship between SOC and information sending is mediated by employee learning orientation.

Hypothesis 2b. The relationship between SOC and information receiving is mediated by employee learning orientation.

2.4. Sense of coherence, trust and information sharing

An inherent attribute of a strong SOC is a fundamental trust in people and in their responsiveness when needed, while a weak SOC signifies a lack of trust in others (Antonovsky, 1993). Manageability refers to the notion that one has the needed resources to cope with challenges and even hardship. These resources include trusted social connections, such as colleagues (Antonovsky, 1987b). Interpersonal trust as a crucial factor of manageability is also expressed in the SOC scale (Sandell, Blomberg and Lazar, 1998). As trust is known to influence information sharing (Wilson, 2010; Özer & Yanchong, 2017), the mediating role of trust between SOC and

information sharing was investigated in the study. In other contexts, trust has been found to mediate between SOC and subjective happiness (Isowa, 2016).

Trust is one of the most influential factors in information sharing. Most studies on trust have focused on sending (e.g., Tsai and Cheng, 2012). Sending information has been found to require both affect- and cognitive-based interpersonal trust (Holste and Fields, 2010). Trust, however, is relevant both for sending and receiving information (Liu et al., 2016; Yang and Maxwell, 2011).

It has been found that those with a strong SOC tend to perceive the overall organizational climate favourably. They feel heard, and believe that they can influence their work conditions (Feldt, Kinnunen and Mauno, 2000; Kalimo and Vuori, 1991). Leaders are seen as emphatic and friendly, and supportive of interaction among staff (Mitonga-Monga and Hlongwane, 2017). Collaboration with colleagues is regarded as open and constructive, with a belief that colleagues will help out if needed (Kalimo and Vuori, 1991; Feldt et al., 2004). Feeling heard and respected could enable sending information, while trust in colleagues and leaders may increase receptivity to information.

The connection between trust and information sharing, followed by the relation between SOC and trust, leads us to the third set of hypotheses:

Hypothesis 3a. The relationship between SOC and information sending is mediated by trust.

Hypothesis 3b. The relationship between SOC and information receiving is mediated by trust.

2.5. Research model

The proposed model links the six hypotheses together to explain the influence of SOC both directly on information receiving and information sending as part of information sharing, and indirectly as mediated by employee learning orientation and trust (Figure 1).

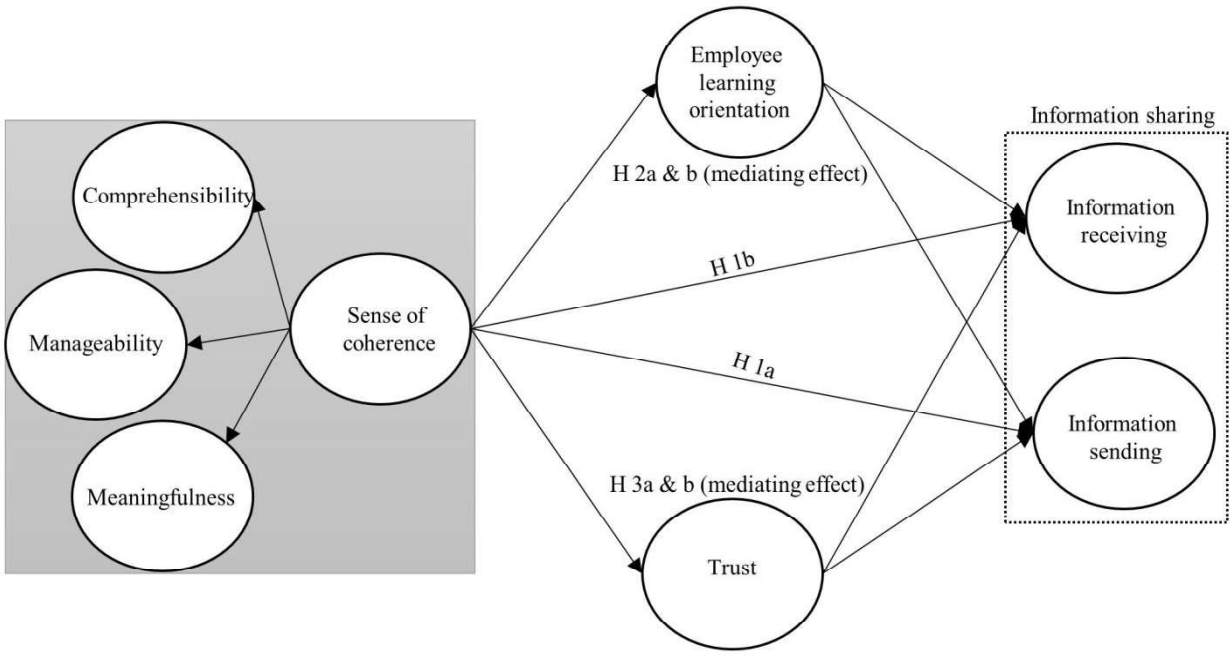


Figure 1. Research model and hypotheses

3. Methodology

3.1 Data

Adopting a convenience sampling approach, the data for this study was collected using a survey distributed through the intranet at a multinational organization which operates in the marine and energy industry and has operations in 70 countries around the world. The organization develops power sources such as turbines and provides power maintenance services for the shipping industry.

Table 1. Demographic profile of respondents

Variable	Category	% of respondents
Age	18–29	20.6
	30–39	37.9
	40–49	27.6
	50–59	13
	60 and above	1
Years of experience	0–5	38.7
	6–10	35
	More than 10	26.3
Gender	Male	66.1

	Female	33.9
Hierarchal level	Top	11.5
	Middle	32.4
	Lower	56.1
Continent	Africa	1
	Asia	16
	Europe	72
	North America	4
	South America	7

There are 169 values missing in the dataset, which account for 2.2 per cent of total values. Little's missing completely at random (MCAR) test was performed to examine missing data patterns (Little and Rubin, 2002). The null hypothesis that the data are missing completely at random was non-significant ($p > .05$), which confirms that there is no systematic pattern in missing values. Consequently, any kind of imputation method can be applied to replace missing values. Hair et al. (2014) suggest the mean value replacement method when the number of missing values per indicator does not exceed 5 per cent. No indicator in the dataset has more than 5 per cent missing values, and hence the mean value replacement method was applied.

3.2 Measures

A seven-point Likert scale was used to measure all variables in the survey.

SOC was measured using a multidimensional scale presented by Antonovsky (1987b). The scale has three interrelated components: comprehensibility, manageability, and meaningfulness. Some of the items are reverse coded and were corrected prior to the analysis. A high score indicates strong SOC, and vice versa.

Information sharing includes both information sending and receiving. Davenport and Prusak (1998) have established that information sharing is a two-way process involving sending and receiving. Some employees might receive more while others send more. Measures from Foss et al. (2009) were adopted to measure information sending and receiving. For information sending, respondents were asked about the extent to which they engage in information dissemination to

their colleagues, including senior and junior colleagues. For information receiving, respondents were asked to indicate the extent their colleagues share information with them. Trust was measured using a two-item scale adopted from Helliwell and Huang (2010). A four-item scale was developed to measure employee learning orientation, based on the definition of the concept provided in Gong et al. (2009). The survey was pre-tested by three persons to ensure that question content, wording, sequence and difficulty were appropriate (Akter, Dambra and Ray, 2011). Minor adjustments were made after the pre-test.

3.3 Data analysis

Partial least square structural equation modelling (PLS-SEM) was used to validate the measures and for data analysis. PLS-SEM is a second-generation statistical technique whose application has become widespread in recent years (Wong, 2013; Hair et al., 2011). PLS-SEM has less restrictive assumptions about the data; it can handle a small sample size and non-normally distributed data because it applies nonparametric bootstrapping (Hair et al., 2011). The analysis was conducted with Smart PLS 2.0 (Ringle et al., 2005). A path-weighting scheme for the inner weight estimation and nonparametric boot strapping with 500 replications for significance level determination was used (Becker et al., 2012; Hair et al., 2014; Wetzels et al., 2009). In the analysis and interpretation of the data, guidelines given by Becker et al. (2012) and Hair et al. (2016) were followed. Consequently, the measurement model was evaluated before the structural model.

4. Results

4.1 Measurement model

The measurement model was assessed for its reliability (indicator reliability, internal consistency reliability) and validity (convergent and discriminant validity). As shown in Table 2, all indicator loadings are above the threshold value of 0.60 and significant at .01 (Chin, 1998; Henseler et al., 2009). Cronbach alpha values of all the constructs are above 0.70, except for trust (0.65) and manageability (0.69). Nevertheless, composite reliability, which in the literature (Hair et al., 2011; Henseler et al., 2009) is considered more appropriate for PLS-SEM, ranges from 0.83 to 0.89,

which is well above the cut-off value of 0.70 (Amaro and Duarte, 2015). Hence, all the constructs had appropriate levels of reliability.

Table 2. Measurement model evaluation results

Constructs	Mean	SD	Loadings	CR	Alpha	AVE
Information sending (Foss et al., 2009)	6.08	1.11		0.87	0.77	0.69
- I share work-related information with my colleagues in my own organization.			0.90			
- I share work-related information with my superiors.			0.77			
- I share work-related information with my junior colleagues in my own organization.			0.83			
Information receiving (Foss et al., 2009)	5.19	1.50		0.88	0.80	0.72
- My colleagues in my own organization share a lot of work-related information with me.			0.83			
- My junior colleagues in my own organization share a lot of information with me.			0.87			
- My superiors share a lot of work-related information with me.			0.84			
Employee learning orientation (based on Gong, Huang and Farh, 2009)	5.35	1.41		0.82	0.72	0.54
- It is important to critically reflect on what is important for my success in my work and be open to new approaches.			0.83			
- I am learning a lot of things in my free time that are useful for my success in my work.			0.65			
- I think it is important to benchmark my own knowledge and practices with others from outside of my department.			0.71			
- It is important for success in my work to be knowledgeable about people who are not from my own department (e.g., customers, colleagues, competitors).			0.75			
Trust (Helliwell and Huang, 2010)	5.21	1.30		0.85	0.65	0.74
- I trust the management at my workplace.			0.87			
- I trust my co-workers at my workplace.			0.85			
Comprehensibility (Antonovsky, 1987b)	4.81	1.55		0.83	0.73	0.56
- When something happened, have you generally found that you saw things in the right proportion?			0.62			
- Do you have the feeling that you are in an unfamiliar situation and do not know what to do?			0.74			
- Do you have very mixed-up feelings and ideas?			0.82			
- Does it happen that you have feelings inside you would rather not feel?			0.79			
Manageability (Antonovsky, 1987b)	4.90	1.52		0.81	0.69	0.52
- Has it happened that people who you counted on disappointed you? (RC*)			0.63			
- How often do you have feelings that you are not sure you can keep under control?			0.77			
- Do you have the feeling that you are being treated unfairly? (RC)			0.79			

- Many people – even those with a strong character – sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past? (RC)			0.67			
Meaningfulness (Antonovsky, 1987b)	5.16	1.49		0.83	0.72	0.55
- How often do you have the feeling that there is little meaning in the things you do in your daily life?			0.82			
- Do you have the feeling that you don't really care about what goes on around you?			0.60			
- Until now your life has had very clear goals and purpose			0.74			
- Doing the things you do every day is a source of pain & boredom (RC)			0.78			

* Reverse coded

The average variance extracted (AVE) value of each construct was calculated to assess convergent validity. All the constructs have AVE values above the recommended 0.50 (Hair et al., 2014). Discriminant validity was assessed using the Fornell-Larcker (1981) criterion, which requires the AVE of each construct to be higher than its correlation with other constructs (Wong, 2013). Table 3 provides the correlation coefficients in the off-diagonal elements of the matrix and the square roots of each construct's AVE along the diagonal. The values highlighted with bold font along the diagonal are greater than all respective rows and columns, which fulfils the Fornell-Larcker criterion. Moreover, construct indicator loadings and cross loadings were examined (Table A1, Appendix), which showed that every indicator loads more on its respective construct than on any other construct, thus further establishing the discriminant validity of all the constructs (Chin, 2010).

Table 3. Discriminant validity assessment

	1	2	3	4	5	6	7
Information sending	**0.83**						
Information receiving	0.46	**0.85**					
Employee learning orientation	0.43	0.24	**0.74**				
Trust	0.25	0.31	0.31	**0.86**			
Comprehensibility	0.21	0.20	0.29	0.22	**0.75**		
Manageability	0.22	0.19	0.21	0.42	0.64	**0.72**	
Meaningfulness	0.24	0.18	0.31	0.39	0.60	0.63	**0.74**

Bold numbers represent the square roots of the AVEs.

Sense of coherence is operationalized as a second-order multidimensional construct consisting of three first-order manifest variables. The 'degree of explained variance of a hierarchical construct is reflected in its components' (Akter, Ambra, & Ray, 2011, p.110), which in this case are comprehensibility (87%, $p < 0.05$), manageability (75%, $p < 0.05$) and meaningfulness (78%, $p < 0.05$; see Figure 2), indicating that all three dimensions significantly reflect sense of coherence.

4.2 Structural model

A step-by-step analysis tested the hypotheses (Klarner et al., 2013). First, the relationship between SOC and information sharing (sending and receiving) was tested without the presence of mediators (Hypothesis 1). In the second step, each mediator was introduced separately (Hypotheses 2 and 3). Finally, the full PLS path model was assessed by including both mediators simultaneously. The PLS-SEM mediator analysis follow the guidelines given by Hair et al. (2016) and Klarner et al. (2013). The summary of the support for hypotheses is presented in Table 4.

Table 4. Summary of the support for hypothesis

Proposed hypotheses	**Empirical evidence**
H1a. SOC → information sending	Supported
H1b. SOC → information receiving	Supported
H2a. SOC → employee learning orientation → information sending	Supported
H2b. SOC → employee learning orientation → information receiving	Supported
H3a. SOC → trust → information sending	Supported
H3b. SOC → trust → information receiving	Supported

The results of all three steps are given in Tables 5 and 6. Table 5 presents direct effects while Table 6 shows indirect effects. The first hypothesis assumed that SOC would positively influence employees' information sharing. The results (Table 5, Model 1) substantiate this hypothesis, as

SOC is significantly associated with information sending ($\beta = 0.26$, $p < 0.001$) as well as receiving ($\beta = 0.23$, $p < 0.001$).

Table 5. Structural model assessments

	Model 1		**Model 2**		**Model 3**		**Model 4**	
Relation	β	p-value	β	p-value	β	p-value	β	p-value
SOC -> IS	0.26 (0.07)	0.000	0.14 (0.20)	0.00	0.19 (0.10)	0.00	0.06 (0.23)	0.24
SOC -> IR	0.23 (0.05)	0.000	0.16 (0.08)	0.01	0.12 (0.11)	0.09	0.05 (0.15)	0.47
SOC -> ELO			0.31 (0.10)	0.00			0.31	0.00
ELO -> IS			0.39	0.00			0.39	0.00
ELO -> IR			0.19	0.01			0.20	0.01
SOC -> T					0.40 (0.16)	0.00	0.40	0.00
T -> IS					0.17	0.02	0.20	0.01
T -> IR					0.27	0.00	0.28	0.00

R^2 values are in brackets

SOC = Sense of coherence; IS = Information sending; IR = Information receiving; ELO = Employee learning orientation; T = Trust

In the next step, the first mediating variable in the model, employee learning orientation, was included to analyze whether learning orientation mediates the relation between SOC and information sharing (Hypothesis 2). It was found that SOC has significant effect on employee learning orientation ($\beta = 0.31$, $p < 0.01$), which in turn has significant effect on information sending ($\beta = 0.39$, $p < 0.01$) and receiving ($\beta = 0.19$, $p < 0.01$; Table 6, Model 2). The indirect effects of SOC on information sending (0.12, $p < 0.01$) and information receiving (0.06, $p < 0.01$) via employee learning orientation are statistically significant (Table 6, Model 2).

Table 6. Analysis of mediating effects

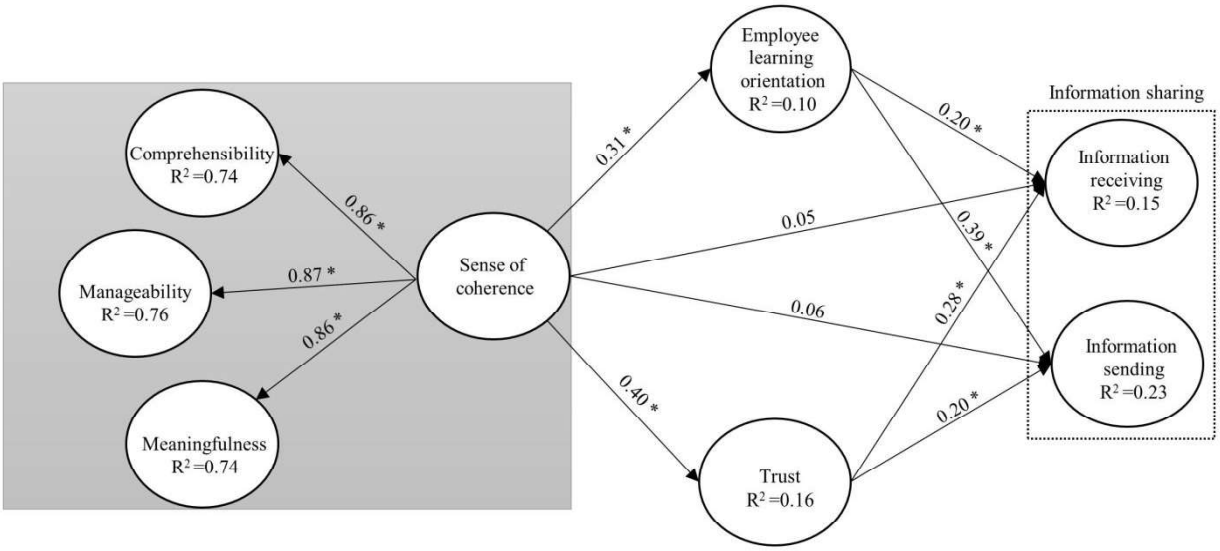
	Model 2 Employee learning orientation as mediator			Model 3 Trust as mediator			Model 4 Both mediators		
Relation	Total effect	Indirect effect	VAF	Total effect	Indirect effect	VAF	Total effect	Indirect effect	VAF
SOC -> information sending	0.26	0.12**	46%	0.26	0.07*	27%	0.26	0.20**	77%
SOC -> information receiving	0.23	0.06*	26%	0.23	0.11**	50%	0.22	0.20**	91%

*p < 0.05, **p < 0.01 (two-sided test); VAF = variance accounted for.

At the same time, the relationship of SOC with information sending and receiving remains significant but the strength of the relations has reduced from 0.26 to 0.14 and 0.23 to 0.16 (Table 5, Model 2), respectively. Hence, employee learning orientation partially mediates the relationship of SOC and information sharing. The variance accounted for (VAF), which represents the ratio of the indirect effect to the total effect, determines the size of the mediation in the range of 0 to 100 (Helm et al., 2010). Higher values indicate stronger mediations. The VAF levels of information sending and receiving are 46% and 26% respectively (Table 6, Model 2), which represents moderate partial mediation. Overall, the result supports the second hypothesis.

In the next stage, the mediating effect of trust was tested (hypothesis 3). The inclusion of trust reduced the strength of the relationship between SOC and information sending and receiving (Table 6, Model 3). The relationship of SOC with information sending remains significant but with receiving it becomes insignificant. Moreover, the indirect effects of SOC on information sending (0.07, $p < 0.05$) and receiving (0.11, $p < 0.05$) are also significant (Table 6, Model 3). In addition, VAF values, 27% for information sending and 50% for information receiving, show moderate and strong mediation respectively. Overall, the results show that trust mediates the SOC's association with information sharing, partially for sending but fully for receiving. Consequently, the third hypothesis is also confirmed.

In the last step, the results of the full path model with the inclusion of both mediators was assessed (Table 5 - Model 4, Figure 2). To assess the joint role of employee learning orientation and trust as mediators of the influence of SOC on information sharing, results were compared with the model without mediators (Table 5, Model 1). The results show that the direct effect of SOC on information sharing has reduced considerably; a difference of 0.20 and 0.18 for information sending and receiving respectively. The relationships are no longer significant. The VAF values for the full path model with two mediators are 77% and 91% (Table 6, Model 4) for information sending and receiving respectively, indicating strong overall mediation. The results confirm that trust and employee learning orientation together mediate the relationship between SOC and information sharing. This joint analysis substantiates the previous findings.



Notes: *p < 0.01 (two-sided test)

Figure 2. Structural model with both mediators (Model 4)

5. Discussion

5. 1. Discussion of results

As SOC fundamentally is a measure of resilience to stress and an ability to adapt to challenges and adversities, our findings underline that information sharing may to a considerable extent be a result of socio-emotional well-being at the workplace rather than merely a cognitive decision. Previous studies have shown that subjective well-being increases information sharing (Chumg, Cooke & Hung, 2015; Wang,Yang & Xue, 2017). This study, however, provides an explanation of what may lie behind well-being, namely an individual difference in sense of connectedness to the environment. This means that sharing cannot be forced, but rather springs from contented employees. A holistic understanding and subsequent promotion of employee well-being are thereby crucial for encouraging sharing. Moreover, social inclusiveness, inherent in SOC, enhances sharing through socio-emotional factors such as trust. Trust creates more opportunities for sharing through larger networks and frequent interaction. Characteristic for a strong SOC is socio-emotional connectivity and a cognitively holistic worldview where new information fits in and makes sense (Antonovsky, 1993); thus, the employee is able to critically evaluate and sort the information (s)he receives from his/her colleagues and have a cognitive command of the information process (Ek, 2005; Ek and Widén-Wulff, 2008). This makes it easier to judge whether the information received is trustworthy.

The findings showed that patterns of sending and receiving information could be explained by different mechanisms. Employee learning orientation had a stronger impact on information sending than it had on receiving, whereas trust affected information receiving more strongly than it did sending. The relation to trust contrasts with Cleveland and Ellis' (2015) finding of a stronger impact on sending. Perhaps counter-intuitively, employee learning orientation was more strongly linked to sending than to receiving information. Although receiving information is evidently connected to learning, in this context sending information may be part of a strategy of aiming for success and viewing challenges as learning opportunities. Visibility, networking, benchmarking expertise and getting feedback, for example via social media, are vital elements in contemporary working life. A contemporary expression of employee learning orientation may thereby be active communication across boundaries to test the reception of ideas, gain feedback and broaden contacts as part of developing one's own expertise. A strong SOC suggests adaptability and a mindset of trying to transform challenges into meaningful pursuits wherever possible. Employees may also have a more holistic and expansive sense of their information worlds where work and leisure contacts are intertwined (Huvila and Ahmad, 2018). Learning for work purposes thereby takes place even outside the actual work context. Previous work has found that learning orientation increases sharing, since explaining things to others clarifies one's own understanding (Wang and Noe, 2010).

5. 2. Theoretical contributions

The novel contribution of the study is the introduction of SOC as an influential factor on information sharing at the workplace. The model underpinning SOC underlines the importance of feeling cognitively and emotionally connected to your environment, with an ability to handle as well as act on information (Antonovsky, 1991, 1993). This sense of connectedness results in more information sharing. Through the lens of SOC, we approach information sharing from a well-being perspective, which largely has been overlooked in information sharing research (with the exceptions of Chumg, Cooke & Hung, 2015 and Wang,Yang & Xue, 2017). Studies show that an organizational culture which nurtures employee well-being creates social norms and attitudes that foster information sharing (Mehairi and Binning, 2014). This study underlines that individual differences in employee well-being are also directly connected to information sharing.

An employee with a strong SOC who regards the environment, including the workplace, as comprehensible, manageable and meaningful will be more engaged in information sharing. The cognitive dimension of comprehensibility is a prerequisite for all aspects of information management, but the dimensions of meaningfulness and manageability seem particularly important for information sharing. This underlines information sharing as a socio-emotional activity. Meaningfulness in life creates an emotional social connectedness which forms the foundation for sharing, while manageability includes counting on trusted social resources for help when needed. This may explain why trust particularly influenced information receiving. Meaningfulness, moreover, suggests a drive to invest in life's challenges, including an intrinsic motivation to perform well at work (Antonovsky, 1987a). In the present study, meaningfulness manifested in an increased employee learning orientation, which suggests a drive to excel in work tasks. This in turn increased sending information.

5.3. Implications for practice

The significance of SOC for a key information management issue, information sharing, points to the importance of acknowledging and testing SOC when recruiting personnel. Moreover, employee learning motivation was found to be a substantial factor behind sharing. It can be enhanced by matching employees with tasks that motivate them, monitoring employee motivation and by supporting employees in engaging in relevant training and continuing education.

The findings also underline the need to develop measures to compensate for a weak SOC. Antonovsky (1987a) has suggested that influence at work may increase meaningfulness, while control over workload increases manageability. Moreover, a clear perception of the work environment and of one's own work role increases comprehensibility (Antonovsky, 1987a). This underlines the importance of participatory and transparent processes that acknowledge workers' agency.

In multinational organizations, multilingual information and communication strategies and systems may increase comprehensibility. Enhancing international intra-organizational social connectedness may strengthen meaningfulness, while manageability at work may be further

enhanced by accounting for cultural differences in communication style and preferences. Strengthening social bonds through social activities outside of work and mentoring systems across national borders, for example on online platforms, may further increase social connectivity and SOC at work.

It is known that trust influences information sharing (Chen et al., 2014; Yang and Maxwell, 2011). However, the present study showed that trust influenced receiving and sending differently. This difference could help to pinpoint where and how to encourage trust and sharing. Individuals with important information to share need to be perceived as trustworthy. The organization should consider trust building as an explicit management approach to facilitate information sharing. Similarly, even if it might appear counterintuitive, strengthening the learning orientation of employees could improve information sending. If information sending is a strategy for improving personal success, a possible approach to incentivizing individuals to share is to make information sending a formal measure of performance.

5.4. Limitations and future research directions

It should be noted that the results are based on a self-reporting. It may be that those with a strong SOC simply perceive that they receive more information from colleagues due to their generally more trusting and coherent worldview. The measures do not reveal actual receiving and sending. Moreover, trust was measured using a two-item scale by Helliwell and Huang (2010). More comprehensive and multidimensional scales of trust would provide a more nuanced understanding of the relationship between different aspects of trust and information sharing. For our purposes, however, a simple context-independent measure was chosen because our respondents represented a large variety of employees in a multinational organization. Helliwell and Huang's (2010) measure is based on large Canadian and US surveys of the general workforce and was therefore suited for our diverse sample.

A limitation of this study regards the low coefficient of determination, denoted R^2, which is below 30, suggesting that sense of coherence does not account for most of the variance in information sharing (sending and receiving). Therefore, sense of coherence cannot be claimed to be as important as major antecedents of information sharing such as organizational culture (Widén and

Steinerová, 2019). In this study, the original sense of coherence scale was used (Antonovsky, 1987b). Although the scale was developed for measuring well-being in everyday life, it may not capture all aspects of well-being at the workplace due to different contexts incorporating environmental factors specific to working life.

Some of the indicator loadings in Table A1 (Appendix) are lower than 0.70, which is usually considered an ideal threshold in SEM analysis. None of the loadings are, however, lower than 0.60. The indicator loadings are, therefore, considered acceptable, particularly for an exploratory model such as the one in our study (Hair et al., 2016).

In future research, it would be useful to analyze the impact of SOC on information sharing in more detail by focusing on information sources, quality and content. SOC should also be investigated in other information management contexts, such as personal information management. Finally, employee well-being has received little attention in research on information sharing. Further research should address how different aspects of well-being, including burnout, workaholism and even physical health would influence an employees' sending and receiving of information.

6. Conclusion

To conclude, our findings underline the significance of employees' sense of coherence (SOC) in information sharing at the workplace. As a salutogenic concept, SOC highlights health promotion as a preventive measure. This underlines that a holistic focus on employee well-being is an important prerequisite for sharing. A strong SOC may facilitate sharing, while a weak SOC may be a hindrance. Therefore, employees' connectedness, influence, agency and well-being at the workplace can either make or break their willingness to engage in information sharing activities.

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Appendix.

Table A1. Loadings and cross loadings

Indicators	Comprehensibility	Manageability	Meaning	Information receiving	Information sending	Employee learning orientation	Trust
Item 1	**0.62**	0.36	0.39	0.15	0.16	0.18	0.12
Item 2	**0.74**	0.48	0.43	0.15	0.20	0.29	0.18
Item 3	**0.79**	0.52	0.49	0.12	0.14	0.17	0.14
Item 4	**0.82**	0.53	0.48	0.18	0.14	0.23	0.22
Item 1	0.35	**0.63**	0.29	0.21	0.27	0.16	0.27
Item 2	0.54	**0.77**	0.54	0.06	0.10	0.23	0.23
Item 3	0.43	**0.79**	0.52	0.22	0.19	0.07	0.47
Item 4	0.50	**0.67**	0.43	0.09	0.12	0.13	0.23
Item 1	0.55	0.58	**0.82**	0.18	0.18	0.26	0.30
Item 2	0.35	0.39	**0.60**	0.14	0.11	0.15	0.28
Item 3	0.43	0.37	**0.74**	0.09	0.15	0.24	0.28
Item 4	0.42	0.51	**0.78**	0.13	0.26	0.24	0.31
Item 1	0.13	0.11	0.11	**0.83**	0.31	0.21	0.24
Item 2	0.18	0.22	0.16	**0.87**	0.39	0.17	0.34
Item 3	0.20	0.15	0.20	**0.84**	0.46	0.23	0.20
Item 1	0.20	0.23	0.23	0.42	**0.89**	0.42	0.22
Item 2	0.15	0.15	0.17	0.31	**0.77**	0.30	0.21
Item 3	0.18	0.17	0.19	0.40	**0.82**	0.35	0.18
Item 1	0.26	0.19	0.25	0.20	0.40	**0.83**	0.09
Item 2	0.34	0.18	0.32	0.13	0.17	**0.65**	0.06
Item 3	0.16	0.13	0.15	0.19	0.29	**0.71**	0.02
Item 4	0.12	0.12	0.21	0.18	0.37	**0.75**	0.07
Item 1	0.26	0.37	0.39	0.25	0.19	0.07	**0.87**
Item 2	0.12	0.35	0.29	0.30	0.23	0.07	**0.85**

Table 1. Demographic profile of respondents

Variable	Category	% of respondents
Age	18-29	20.6
	30-39	37.9
	40-49	27.6
	50-59	13
	60 & above	1
Gender	Male	66.1
	Female	33.9
Hierarchal level	Top	11.5
	Middle	32.4
	Lower	56.1
Continent	Africa	1
	Asia	16
	Europe	72
	North America	4
	South America	7

Table 2. Measurement model evaluation results

Constructs	Mean	SD	Loadings	CR	Alpha	AVE
Information sending (Foss et al., 2009)	6.08	1.11		0.87	0.77	0.69
- I share work related information with my colleagues in my own organization.			0.90			
- I share work related information with my superiors.			0.77			
- I share work related information with my junior colleagues in my own organization.			0.83			
Information receiving (Foss et al., 2009)	5.19	1.50		0.88	0.80	0.72
- My colleagues in my own organization share a lot of work related information with me.			0.83			
- My junior colleagues in my own organization share a lot of information with me.			0.87			
- My superiors share a lot of work-related information with me.			0.84			
Employee learning orientation (based on Gong, Huang and Farh, 2009)	5.35	1.41		0.82	0.72	0.54
- It is important to critically reflect what is important for my successfulness in my work and be open to new approaches.			0.83			
- I am learning a lot of things on my free time that are useful for my successfulness in my work.			0.65			
- I think it is important to benchmark my own knowledge and practices with others from outside of my department.			0.71			
- It is important for success in my work to be knowledgeable about the people who are not from my own department (e.g. customers, colleagues, competitors).			0.75			
Trust (Helliwell and Huang, 2010)	5.21	1.30		0.85	0.65	0.74
- I trust in management at my workplace.			0.87			
- I trust my co-workers at my workplace.			0.85			
Comprehensibility (Antonovsky, 1987b)	4.81	1.55		0.83	0.73	0.56
- When something happened, have you generally found that you saw things in the right proportion			0.62			
- Do you have the feeling that you are in an unfamiliar situation and do not know what to do?			0.74			
- Do you have very mixed-up feelings and ideas?			0.82			
- Does it happen that you have feelings inside you would rather not feel?			0.79			
Manageability (Antonovsky, 1987b)	4.90	1.52		0.81	0.69	0.52
- Has it happened that people whom you counted on disappointed you? (RC*)			0.63			
- How often do you have feelings that you are not sure you can keep under control?			0.77			
- Do you have the feelings that you are being treated unfairly? (RC)			0.79			
- Many people – even those with a strong character – sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past? (RC)			0.67			
Meaningfulness (Antonovsky, 1987b)	5.16	1.49		0.83	0.72	0.55

- How often do you have the feeling that there is little meaning in the things you do in your daily life?	0.82
- Do you have the feeling that you don't really care about what goes on around you?	0.60
- Until now your life has had very clear goals and purpose	0.74
- Doing the things you do every day is a source of pain & boredom (RC)	0.78

* Reverse coded

Table 3. Discriminant validity assessment

	1	2	3	4	5	6	7
Information sending	**0.83**						
Information receiving	0.46	**0.85**					
Employee learning orientation	0.43	0.24	**0.74**				
Trust	0.25	0.31	0.31	**0.86**			
Comprehensibility	0.21	0.20	0.29	0.22	**0.75**		
Manageability	0.22	0.19	0.21	0.42	0.64	**0.72**	
Meaningfulness	0.24	0.18	0.31	0.39	0.60	0.63	**0.74**

Bold numbers represent the square roots of the AVEs.

Table 4. Summary of the support for hypothesis

Proposed hypotheses	**Empirical evidence**
H1a. SOC → information sending	Supported
H1b. SOC → information receiving	Supported
H2a. SOC → employee learning orientation → information sending	Supported
H2b. SOC → employee learning orientation → information receiving	Supported
H3a. SOC → trust → information sending	Supported
H3b. SOC → trust → information receiving	Supported

Table 5. Structural model assessments

	Model 1		**Model 2**		**Model 3**		**Model 4**	
Relation	β	p-value	β	p-value	β	p-value	β	p-value
SOC -> IS	0.26 (0.07)	0.000	0.14 (0.20)	0.00	0.19 (0.10)	0.00	0.06 (0.23)	0.24
SOC -> IR	0.23 (0.05)	0.000	0.16 (0.08)	0.01	0.12 (0.11)	0.09	0.05 (0.15)	0.47
SOC -> ELO			0.31 (0.10)	0.00			0.31	0.00
ELO -> IS			0.39	0.00			0.39	0.00
ELO -> IR			0.19	0.01			0.20	0.01
SOC -> T					0.40 (0.16)	0.00	0.40	0.00
T -> IS					0.17	0.02	0.20	0.01
T -> IR					0.27	0.00	0.28	0.00

R^2 values are in brackets

SOC = Sense of coherence; IS = Information sending; IR = Information receiving; ELO = Employee learning orientation; T = Trust

Table 6. Analysis of mediating effects

	Model 2 Employee learning orientation as mediator			Model 3 Trust as mediator			Model 4 Both mediators		
Relation	Total effect	Indirect effect	VAF	Total effect	Indirect effect	VAF	Total effect	Indirect effect	VAF
SOC -> information sending	0.26	0.12**	46%	0.26	0.07*	27%	0.26	0.20**	77%
SOC -> information receiving	0.23	0.06*	26%	0.23	0.11**	50%	0.22	0.20**	91%

*p < 0.05, **p < 0.01 (two-sided test); VAF = variance accounted for.

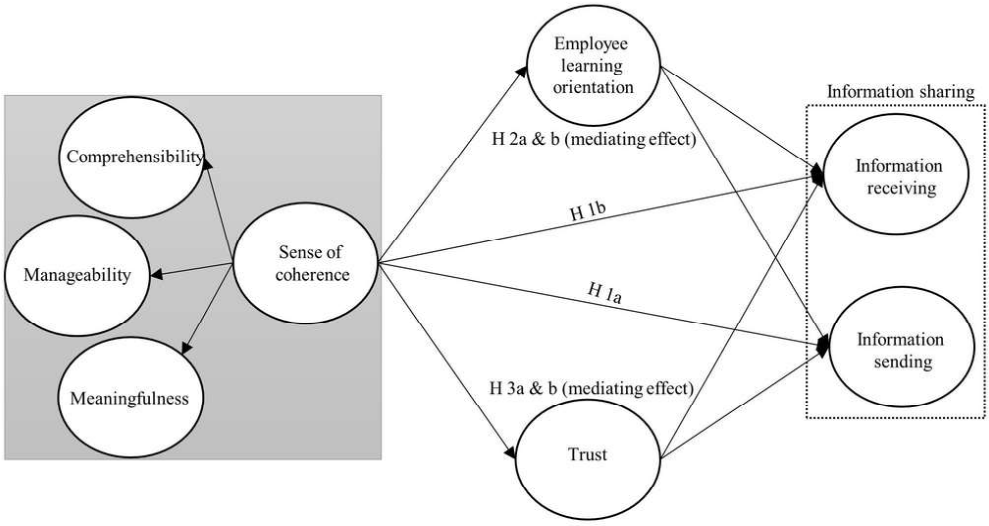

Figure 1. Research model and hypotheses

172x92mm (150 x 150 DPI)

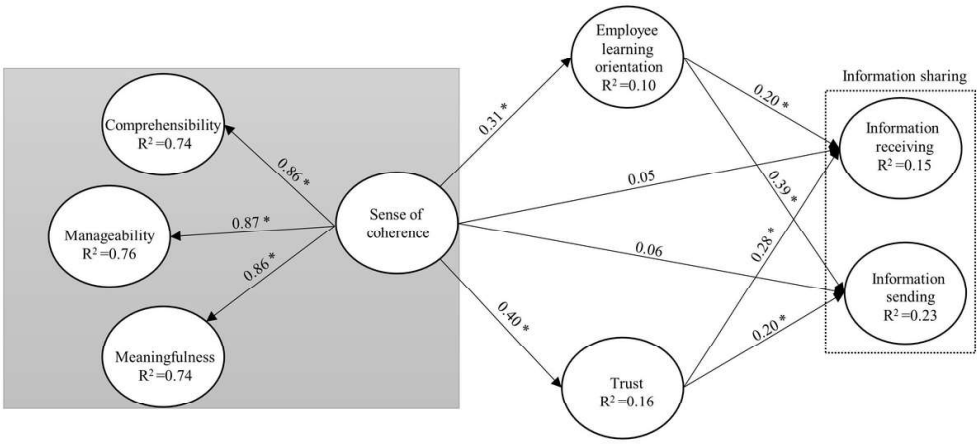

Figure 2. Structural model with both mediators (Model 4)

205x91mm (150 x 150 DPI)

Table A1. Loadings and cross loadings

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Item 2	0.18	0.22	0.16	**0.87**	0.39	0.17	0.34
Item 3	0.20	0.15	0.20	**0.84**	0.46	0.23	0.20
Item 1	0.20	0.23	0.23	0.42	**0.89**	0.42	0.22
Item 2	0.15	0.15	0.17	0.31	**0.77**	0.30	0.21
Item 3	0.18	0.17	0.19	0.40	**0.82**	0.35	0.18
Item 1	0.26	0.19	0.25	0.20	0.40	**0.83**	0.09
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Item 3	0.16	0.13	0.15	0.19	0.29	**0.71**	0.02
Item 4	0.12	0.12	0.21	0.18	0.37	**0.75**	0.07
Item 1	0.26	0.37	0.39	0.25	0.19	0.07	**0.87**
Item 2	0.12	0.35	0.29	0.30	0.23	0.07	**0.85**