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Understanding the climate-knowledge sharing relation: The moderating roles of intrinsic motivation and job autonomy

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ABSTRACT

A cooperative organizational climate is often argued to promote knowledge-sharing behaviors among employees. However, research indicates that managerial interventions aimed at shaping the organizational climate can be difficult to execute. We develop and test a contingency model of intrinsic motivation and job autonomy as moderators of this relationship. We find that the social climate for cooperation better predicts knowledge sharing when employees show low levels of intrinsic motivation and have high levels of job autonomy. This suggests that a cooperative climate and intrinsic motivation are substitutes with respect to their impact on knowledge-sharing behaviors, while climate and job autonomy are complements. We find support for these ideas in data gathered from a sample of 170 employees of a knowledge-intensive firm.

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1. Introduction

Over the last couple of decades, the argument that knowledge is the primary locus of organizations' competitive advantage has become highly influential (Davenport & Prusak, 1998; Kapoor & Adner, 2012; Zheng, Yang, & McLean, 2010). As a consequence, the interest on how knowledge is manifested in organizations has dramatically increased, and the issue of how processes related to the creation, transfer and use of knowledge between members in organizations can be governed has been placed on the agenda of the human resource management (HRM) literature (Foss & Michailova, 2009; Galunic, Sengupta, & Petriglieri, 2014). The extant literature offers examples regarding how managerial interventions can influence employees' engagement in knowledge sharing activities. In particular it has been suggested that aspects such as flexible work practices or performance management systems (Minbaeva, 2008) may influence the degree of employees' knowledge sharing. However, our knowledge of how such interventions can be designed and implemented remains quite

rudimentary. In this study, we address this knowledge gap by increasing our understanding of the governance of intra-organizational knowledge sharing behaviors. Specifically, we propose that knowledge sharing can be partly explained as a combination of three interrelated aspects: cooperative climate, intrinsic motivation and job autonomy.

Knowledge sharing has been positively linked to the creation of new products and services (Smith, Collins, & Clark, 2005; Zhou & Li, 2012), the transfer of best organizational practices (Pallotti, Tubaro, & Lomi, 2015; Szulanski, 1996) and the development of competitive advantage (Reagans & McEvily, 2003). Knowledge management scholars have dedicated considerable attention to the antecedents of knowledge-sharing behavior, often in the form of some combination of environmental factors and individual characteristics (Bartol & Srivastava, 2002; Mueller, 2014).

A important aspect in promoting intra-organizational knowledge sharing is the cooperative climate in the organization (Černe, Nerstad, Dysvik, & Škerlavaj, 2014; Kettinger, Li, Davis, & Kettinger, 2015), defined as the "organizational norms that emphasize personal effort toward group outcomes or tasks as opposed to individual outcomes" (Collins & Smith, 2006). Scholars have argued that organizations can effectively influence knowledge sharing through different HRM practices and architectures (Minbaeva, Mäkelä, & Rabbiosi, 2012). However, such practices are often particularly difficult to implement due to the discretionary nature

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of knowledge sharing, the difficulties associated to monitoring and formal rewarding as well as the potential crowding-out effects of managerial interventions (Foss, Minbaeva, Pedersen, & Reinholdt, 2009; Osterloh & Frey, 2000).

Little research has empirically explored how individual attributes may moderate the influence of a cooperative climate in knowledge sharing (Bogaert, Boone, & van Witteloostuijn, 2012). This is relevant for knowledge management given that shaping the cooperative climate of a particular organization often requires significant investments in the form of managerial and employee time and effort (Collins & Smith, 2006), as the “climate of the organization is very difficult to change” (Schneider, Brief, & Guzzo, 1996 p. 4). For example, given that employees within organizations are heterogeneous with respect to their work-related attitudes, motives, behaviors and values (Grant & Rothbard, 2013), it may be that some of those attributes make a cooperative climate less needed for them to share knowledge. Or, jobs can be designed so as to exert the same influence on knowledge sharing as a cooperative climate.

In this study, we propose that the cooperative climate-knowledge sharing relation is contingent on two factors: intrinsic motivation and job autonomy. Both aspects have been addressed in earlier work as direct antecedents of knowledge sharing (Gagné, 2009; Pee & Lee, 2015), but not as moderators. Since intrinsic motivation is not fully determined by the social context (Ryan & Deci, 2000), employees exposed to a similar social climate may differ in their intrinsic motivation. Following this logic, we build the argument that organizations where employees are intrinsically motivated will not necessarily demand a cooperative climate to promote knowledge sharing. We also discuss whether management can enhance the positive effects of a cooperative climate by providing more autonomy to employees. Job autonomy has been found to be a direct predictor of cooperative behaviors among employees such as knowledge sharing (Gagné, 2003). Departing from these insights, in this paper we argue that employees who have more job autonomy will also face more opportunities to engage in knowledge sharing activities. That implies that in organizations with a high cooperative climate, job autonomy will potentially boost knowledge sharing behaviors.

In sum, we add to the literature on the management and governance of intra-organizational knowledge sharing by examining the potential contingent effects of intrinsic motivation and job autonomy. We test our hypotheses on a sample of 170 employees from a knowledge-intensive firm, and we discuss directions for future research and managerial implications.

2. Theory and hypotheses development

2.1. HRM practices and knowledge sharing

Given that the effectiveness of formal mechanisms to encourage knowledge sharing has been called into question, researchers have turned to the informal processes such as trust (Casimir, Lee, & Loon, 2012; Collins & Smith, 2006), teamwork (He, Baruch, & Lin, 2014; Smith et al., 2005) or fairness (Bock, Zmud, Kim, & Lee, 2005) as catalyzers of knowledge sharing between organizational members. Relatedly, research has recently recognized the importance of a cooperative climate in fostering knowledge sharing (Quigley, Tesluk, Locke, & Bartol, 2007).

Several theoretical mechanisms may be invoked to explain the causal link between cooperative climate and knowledge sharing. According to a social psychological view, interactions among employees are likely to create descriptive norms of behavior (Ehrhart & Naumann, 2004). Consequently, a cooperative climate can be

conceived of as a source of descriptive norms to behave in a cooperative manner. Furthermore, a cooperative climate implies social exchanges among organizational members and thus, employees may show a tendency to “pay back” their colleagues’ cooperative behavior by engaging in knowledge sharing. Finally, social comparison theory (Festinger, 1954) suggests that when employees are part of a cooperative climate, their comparisons of themselves with other members will result in a greater tendency to behave in a cooperative manner.

When researchers primarily explain employees’ knowledge-sharing behavior as a consequence of the social climate of the organization, they implicitly assume employee homogeneity with respect to how employees respond to contextual variations. However, the heterogeneity of individuals (in terms of values or traits) have fundamental implications for their response to contextual features (Felin & Hesterly, 2007). As employees within organizations are heterogeneous with respect to their work-related attitudes, motives, behaviors and values (Grant & Rothbard, 2013). HRM interventions to shape the organizational climate towards a cooperative one should take such heterogeneity into account. Research on the moderating role of individual-level variables is needed to better assess the consequences of interventions aimed at influence the cooperative climate. In the following section, we introduce two variables that represent sources of heterogeneity in the way that employees respond to a cooperative climate.

2.2. The moderating role of intrinsic motivation

Research on motivation shows that the desire to “make an effort” can derive from various sources. Self-determination theory (SDT) offers a theoretical framework that allows for the differentiation of behaviors with respect to how self-motivated and volitional they are. Intrinsic motivation is defined as the desire to expend effort on a certain task based on an interest in and enjoyment of the task itself (Gagné & Deci, 2005; Ryan & Deci, 2000). When they are intrinsically motivated, employees decide to expend effort based on personal enjoyment rather than based on external forces, such as being told what to do or because of the promise of a reward (Cerasoli, Nicklin, & Ford, 2014). Recent research has recognized intrinsic motivation as an important driver to share knowledge with colleagues (Bock et al., 2005; Cabrera & Cabrera, 2005).

Although SDT scholars note that the emergence of intrinsic motivation may be supported by certain contextual characteristics, they emphasize that it is the nature of the activity *per se* what determines the emergence of intrinsically motivated behaviors. In fact, when individuals feel that contextual factors are pushing them towards certain behaviors, their intrinsic motivation towards that specific behavior tends to decrease (Gagné & Deci, 2005). Employees that are intrinsically motivated are process-focused and see the work as an end in and of itself. For this reason, when intrinsic motivation is high, employees will enjoy the process of performing the task and their behavior will be less determined by the contextual characteristics and more by the nature of the activity to be performed. We extend this rationale to argue that employees differ in their natural tendency to share knowledge with others, that is, in their intrinsic motivation to engage in knowledge sharing. Hence, we propose that employees with higher levels of intrinsic motivation towards knowledge sharing will be less influenced by a cooperative climate on their decision to share knowledge because their behavior is mainly process-focused and less contingent on external factors. In other words, intrinsic motives to share knowledge may be viewed as a reflection of internal dispositions towards the activity itself rather than a response to a given set of contextual

factors such the existence of a cooperative climate. Two theoretical, yet complementary perspectives may be used to support this idea.

First, research on SDT proposes that intrinsically motivated efforts enable individuals to fulfill their basic psychological needs for autonomy, competence and relatedness, which are essential nutrients for optimal human development and integrity (Gagné, 2009). Recent studies suggest that the participation in activities that benefit others may serve as a way to partially fulfill those three primary needs (Grant, 2008; Sheldon & Elliot, 1998). As such, the participation in knowledge sharing may be viewed as a potential activity through which individuals may show a natural interest. Since knowledge sharing is conceived as an extra-role behavior (Nielsen, Rasmussen, Chiang, Han, & Chuang, 2011; Sparrowe, Liden, Wayne, & Kraimer, 2001), employees may experience autonomy need satisfaction when deciding to engage in such behavior (Weinstein & Ryan, 2010). Similarly, knowledge sharing may be closely connected to the fulfillment of the need for relatedness. Because knowledge sharing may lead to building, developing and maintaining social ties with colleagues (Reinholt, Pedersen, & Foss, 2011), some employees may tend to naturally engage in knowledge sharing with others. In addition, research indicates that successfully helping others as well as learning from others' knowledge may elicit feelings of competence (Caprara & Steca, 2005).

Second, organizational behavior scholars note that some individuals are naturally inclined to engage in prosocial behaviors (Bogaert, Boone, & Declerck, 2008; De Cremer & Van Vugt, 1999). That means that their engagement in prosocial actions will be less influenced by contextual factors and more based on internal values and convictions. For example, Grant and Rothbard (2013) show that employees that score higher in prosocial values tend to be more proactive in ambiguous situations compared with those with lower prosocial values. Further, when a certain activity is consistent with personal convictions, core values and enduring interests of the self, intrinsic motivation will be more likely to arise (Sheldon & Elliot, 1998).

Taken together, the above arguments support the idea of a potential substitution effect of cooperative climate and intrinsic motivation in predicting knowledge sharing. We contend that a cooperative climate may become the contextual support towards knowledge sharing for those employees showing low levels of intrinsic motivation to do so. In contrast, those employees with a natural interest towards knowledge sharing (reflected in higher intrinsic motivation towards knowledge sharing) will engage in knowledge sharing behaviors even in absence of a cooperative climate. Therefore, we offer the following hypothesis:

Hypothesis 1. *An employee's intrinsic motivation to share knowledge moderates the relationship between the cooperative climate of the organization and the employee's knowledge sharing behavior. Specifically, increased intrinsic motivation weakens the positive relation between a cooperative climate and knowledge sharing behavior.*

2.3. The moderating role of job autonomy

Research on job design focuses on the structure of the employees' work and its relevant tasks and characteristics (Morgeson & Humphrey, 2006). An important job dimension is job autonomy, which refers to the level of discretion that each employee is given with respect to how to perform her tasks (Hackman & Oldham, 1976). Thus, employees with more job autonomy have greater freedom to decide which tasks to perform, how the work will be done and how work contingencies are to be handled. Job autonomy is positively associated to job performance (Morgeson, Delaney-Klinger, & Hemingway, 2005) and creativity (Spreitzer, 1995),

among others. A direct, positive association between job autonomy and knowledge sharing is also well established in the literature (Cabrera, Collins, & Salgado, 2006; Pee & Lee, 2015).

In keeping with prior research, we predict that job autonomy will reinforce the positive relation between cooperative climate and knowledge sharing for a number of reasons. First, job design research shows that job autonomy is correlated with task variety (Whittington, Goodwin, & Murray, 2004). Because task variety involves the use of more diverse knowledge and skills, knowledge sharing is more likely to arise (Coelho & Augusto, 2010). A similar reasoning is proposed by Cabrera et al. (2006), who argue that job autonomy is normally correlated with creative tasks. Since creative tasks often require that employees search for novel knowledge and ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996), they will be more inclined to participate in knowledge sharing with colleagues, as compared to employees whose tasks require inputs that are lower in creativity. Second, more job autonomy means fewer guidelines on how to perform the required job. This translates into more opportunities for the employee to free up time to engage in knowledge sharing activities (Latham & Pinder, 2005), which means that she is in a better position to take advantage of a cooperative climate. Low levels of job autonomy, on the other hand, indicate that employees have little choice in terms of how to perform their tasks. Under this condition, employees are restricted in terms of operation and method choice, and, hence, they have fewer opportunities to exploit the potential benefits of a cooperative climate.

Consequently, we expect that the freedom and latitude available to employees to make decisions in their jobs present opportunities for them to engage in knowledge sharing activities, thereby reinforcing the positive influence of a cooperative climate in knowledge sharing. This motivates the following hypothesis:

Hypothesis 2. *Job autonomy moderates the relationship between an organizational cooperative climate and an employee's knowledge sharing behavior, such that increased job autonomy enhances the positive relation between a cooperative climate and the employee's knowledge sharing behavior.*

Our hypotheses are summarized in Fig. 1.

3. Research methods

3.1. Data collection and research site

The data were collected from the multinational company MAN Diesel in February 2007. MAN Diesel is a market leader in the provision of diesel engines for marine and plant applications. It is also involved in other business areas, such as the resale of engines and the sale of components. The firm is headquartered in

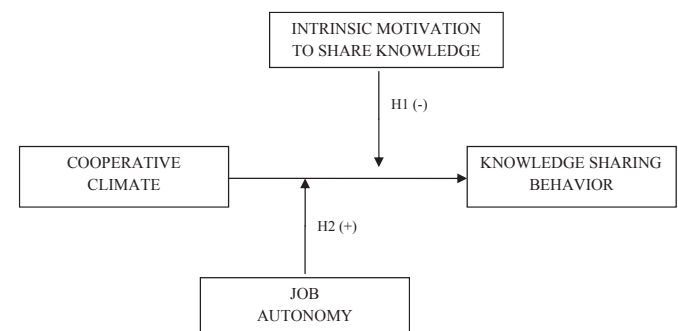


Fig. 1. Theoretical model.

Copenhagen and is 100% owned by the German company MAN, which employs more than 6400 staff members, primarily in their subsidiaries in Germany, Denmark, France, the United Kingdom, the Czech Republic and China. The Copenhagen subsidiary was established more than 100 years ago, and is mostly dedicated to research and development (R&D) activities. As of February 2007, it employed 2488 people. Given to the nature of the functions performed in MAN Diesel and the knowledge-intensive nature of the company, most of the employees are engineers. Yearly sales per employee were 1,246,000 DKK (approximately USD 237,000). MAN Diesel's organizational structure is hierarchical and departmentalized. Knowledge sharing within and between departments is a key managerial concern.

A questionnaire was prepared in Danish language and pre-tested with MAN managers and four management scholars who specialize in survey design and knowledge sharing to ensure the clarity of the questions and to avoid problems with interpretation. The web-based questionnaire was then distributed (by an email from management containing a URL) to employees from departments characterized by a high degree of knowledge-intensive activities (i.e., engineering, research and development, design, purchasing). In February 2007 a firm representative mediated the distribution of the questionnaires and the collection of responses. Social desirability bias (Tsai & Ghoshal, 1998) was reduced by informing the respondents that their answers would be kept completely confidential and that the data was being collected on a server external to the company. We obtained data from 263 of the 505 employees who were invited to participate, giving an overall response rate of 52%. However, some responses were removed because of missing values for some items, so that the final data set included 170 responses. This yields a response rate of 34%.

All data used in the analysis were collected from a single company. This implies that we have controlled for contextual factors that may impact intra-organizational knowledge sharing (Tsai & Ghoshal, 1998). Such a research context may be seen as advantageous relative to data sets encompassing a large number of firms with only a few respondents per company because it keeps many things constant that research would otherwise need to control for. Our objective was to reach those employees of the firm potentially involved in knowledge sharing activities. To do so, we selected departments specifically involved in knowledge sharing: Engineering, R&D, Sales and Marketing, Technical Service, and Purchasing. As our goal was to examine employees' motivations, job autonomy, climate and knowledge-sharing behaviors, we used self-reporting to operationalize and measure the variables, similar to most studies of work motivation (Reinholt et al., 2011) and human behavior (Howard, 1994). Similarly, job characteristics (Foss et al., 2009) and climate features (Argote, Beckman, & Epple, 1990) have previously been captured through self-reporting.

3.2. Common method bias

Common method bias is a potential concern because of our use of self-reporting (Podsakoff & Organ, 1986). To diminish this risk, we reversed some of the scales used in our questionnaire (Rust & Cooil, 1994). Furthermore, according to Evans (1985), models with interaction effects, such as our model, mitigate the risk of common method bias. In addition, we performed a Harman's one-factor test on the items to assess the severity of the common method bias. Harman's one-factor test is the most widely used approach for assessing CMV in a single-method research design (Podsakoff, MacKenzie, Podsakoff, & Lee, 2003). CMV is assumed to exist if: (1) a single factor emerges from unrotated factor solutions or (2) one factor explains the majority of the variance in the variables

(Podsakoff & Organ, 1986 p. 536). In our model, our first two factors capture only 20% and 14% of the total variance, respectively.

Furthermore, we conducted an analysis based on marker variables (Lindell & Whitney, 2001). Such a marker should be measured by the same instrument as the scales used in our analysis, and should not be theoretically related to the more relevant variables in our model. In this case, we used as a marker variable the respondents' degree of participation in Total Quality Management (TQM) teams. All our significant correlations remained significant after the partial correlation adjustment, thus suggesting that results are not highly affected by CMV.¹

The relatively high response rate (34%) makes non-response bias less of a concern. Nevertheless, we compared the demographic variables (age, tenure and level of education) between the early and late respondents (wave analysis) and tested the assumption that the group of late respondents with missing values was more similar to the non-responding group than the group of early respondents (Rogelberg & Stanton, 2007). We performed an ANOVA analysis of the differences in means for the two groups for the demographic variables in order to test this assumption. The results indicate that the hypotheses of differences in the means are all rejected (with F-values < 2), which leads us to believe that our data does not suffer from major problems of non-response bias.

3.3. Measures

The measures for this study were adopted from existing research. Table 1 (in annex) report the items composing each construct, as well as factor loadings, Cronbach's alpha, average variance extracted and composite reliability.

3.4. Dependent variable: knowledge-sharing behavior

According to the extant literature (e.g., Davenport & Prusak, 1998), an assessment of knowledge sharing should consider two actions: (1) the employee's acquisition and use of knowledge, and (2) the employee's provision of knowledge. The acquisition of knowledge was measured by asking individual respondents to indicate the extent to which they had received/used knowledge from colleagues in their own department (two items). Similarly, to assess the provision of knowledge, we asked individual respondents to indicate the extent to which colleagues from the same department had received and used the respondent's knowledge (two items). These four items were measured on a seven-point Likert scale, where 1 = "no or very little extent" and 7 = "very large extent". The construct shows satisfactory reliability and validity (alpha = 0.74, AVE = 0.57, composite reliability = 0.84). The construct of knowledge-sharing behavior was calculated as the average of the four items.

3.5. Independent variables

3.5.1. Cooperative climate

We derived our items for the measurement of the cooperative climate from Husted and Michailova (2002) and Michailova and Husted (2004). These scholars do not explicitly use the construct of "cooperative climate"; instead, they focus on the determinants of knowledge hostility. However, similar constructs are used by Bock et al. (2005) and Collins and Smith (2006) to assess the cooperative climate. In this study, we specifically asked employees to indicate the extent to which they agreed with the following

¹ This analysis is available from the authors upon request.

statements: “Employees in my department cooperate well with each other”, “Employees in my department prefer to create their own knowledge rather than reusing others’ knowledge” and “Employees in my department perceive of each other as competitors”. All items were measured on a seven-point Likert scale ranging from 1 = “strongly disagree” to 7 = “strongly agree”. The last two items were reverse-coded for the statistical analysis. The values of the construct reliability and AVE are 0.84 and 0.64, respectively, which are highly satisfactory. The alpha of the construct is 0.72, which denotes a high level of internal consistency.

3.5.2. Job autonomy

We measured job autonomy by adapting measures of job characteristics from (Sims, Szilagyi, & Keller, 1976). This measurement for job autonomy has been proven adequate in a previous study (Foss et al. 2009). Specifically, the variable was assessed by asking respondents to indicate the extent to which their job was characterized by “The freedom to carry out my job the way I want”, “The opportunity for independent initiative” and “High levels of variety in the job”. The three items were measured using a seven-point Likert scale ranging from 1 = “strongly disagree” to 7 = “strongly agree”, and the construct was calculated as the average of the three items. The alpha for the construct is 0.74 and the composite reliability is 0.85. The AVE value also shows a satisfactory value of 0.64.

3.5.3. Intrinsic motivation

To assess the intrinsic motivation to share knowledge, we adopted scales from the Self-Regulation Questionnaire (Ryan & Connell, 1989), which is based on SDT. We adapted the intrinsic motivation questionnaire in order to create a construct that captures the intrinsic motivation to share knowledge. Thus, the construct used in our questionnaire reflects the intrinsic motivation to engage in a specific behavior – knowledge sharing – across time. To operationalize this construct, we asked respondents to indicate the extent to which they agreed with three items: “I share knowledge because I enjoy doing so”, “I share knowledge because I like it” and “I share knowledge because I find it personally satisfying”. All three items were measured using a seven-point Likert scale ranging from 1 = “strongly disagree” to 7 = “strongly agree”. The construct of intrinsic motivation was calculated as the average of the three items. The obtained alpha for the construct is 0.75, and it shows satisfactory levels of reliability with variance extracted (AVE) of 0.66 and composite reliability of 0.85.

3.5.4. Control variables

As in previous studies of the antecedents of knowledge sharing, our analysis includes a number of control variables. Some of the controls relate to the employee's job, while others refer to motivational and socio-demographical factors that may affect the dependent variable.

As employees can use both formal and informal channels to share knowledge (Stevenson & Gilly, 1991), employees with more informal contacts may have more opportunities to share knowledge. To control for this possibility, we asked respondents: “How often do you have the opportunity to talk informally with colleagues?” We also controlled for the extent to which employees were included in job rotation activities because job rotation may represent an opportunity to share knowledge with colleagues. Concretely, we asked employees “To what extent are you included in job rotation?” which we measured using a seven-point Likert scale. Furthermore, we controlled for employees' education levels by classifying the respondents' education as: high school or below, middle-range training, diploma

degree, bachelor's degree, master's degree and PhD. We also included the number of years of employment in the firm and respondent age as control variables.

Finally, we included the external motivation to share knowledge as a control variable. Existing studies reveal that employees may be willing to share knowledge in exchange for external gains, such as money and praise (Cabrera et al., 2006). As with the intrinsic motivation construct, we adapted a number of items from the Self-Regulation Questionnaire. Specifically, respondents indicated the extent to which they agreed with the following: “I share knowledge because I want my supervisor to praise me”, “I share knowledge because I want my colleagues to praise me”, “I share knowledge because I might get a reward” and “I share knowledge because it may help me get promoted”. All items were measured using a seven-point Likert scale. The reliability of the construct is satisfactory with an alpha of 0.83, an AVE of 0.58 and a composite reliability of 0.83.

Table 1 shows the zero-order correlations among the variables used in the regression analyses. None of the correlation coefficients exceeds the threshold of 0.3, which indicates that multicollinearity in the data is a minor concern. The mean value for the dependent variable (knowledge sharing) is 5.76 (on a seven-point Likert scale). Notably, the level of intrinsic motivation to share knowledge is 5.54 (on a seven-point Likert scale). Furthermore, significant positive correlations exist between job autonomy and a cooperative climate. On average, individuals in a cooperative climate also appear to have high levels of job autonomy in the organization.

4. Results

We used a hierarchical regression model to test the hypotheses. The independent variables were mean-centered before the interaction term was created (Aiken & West, 1991). Furthermore, the variance inflation factor (VIF) was calculated in order to detect potential problems of multicollinearity. The highest VIF value is 1.97 (Tenure, Table 2, Model 3), indicating no concerns regarding multicollinearity (Hair, Black, Babin, Anderson, & Tatham, 2006). The results of the regression are reported in Table 2.

In the first step (Model 0), we entered the control variables related to personal characteristics (age, education and tenure), opportunities to engage in knowledge sharing (job rotation and informal contacts) and extrinsic motivation. The explanatory power of the control variables in this model is limited (R-squared = 0.12, $p < .01$) and only the variable “informal contacts” is significant ($\beta = 0.27$, $p < .001$). In the second step (Model 1), we included the three independent variables (cooperative climate, intrinsic motivation and job autonomy) to test the first-order association. All three variables are significant in this model, which has an R-squared of 0.31 ($p < .001$).

In the third step (Model 2), we added the moderating effect of intrinsic motivation on cooperative climate to test Hypothesis 1. After adding the interaction, the explanatory power of the model reaches an overall R-squared of 0.35. The significance of this increase is tested using an F-test ($F = 10.18$, $p < .01$). As suggested in Hypothesis 1, the interaction between cooperative climate and intrinsic motivation is negative and significant ($\beta = -0.20$, $p < .01$). To facilitate the interpretation of the interaction and following the recommendations of Aiken and West (1991), we plotted the simple slopes for the relationship between a cooperative climate and knowledge sharing at one standard deviation above and below the mean of intrinsic motivation (Fig. 2).

The figure shows that the explanatory power of a social climate for cooperation is significantly higher for employees showing lower levels of intrinsic motivation to share. In

Table 1
Descriptive statistics and correlation matrix (N = 170).

	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10
1 Knowledge sharing	5.757	0.926	3.500	7.000	1.000									
2 Cooperative climate	5.388	1.094	2.000	7.000	0.291*	1.000								
3 Intrinsic motivation	5.541	0.910	3.000	7.000	0.365*	0.117	1.000							
4 Job autonomy	5.692	1.018	1.000	7.000	0.331*	0.184*	0.228*	1.000						
5 Age	2.424	1.025	1.000	4.000	-0.031	0.034	-0.004	0.029	1.000					
6 Education	3.324	1.238	1.000	6.000	0.008	-0.136	0.169*	0.092	0.022	1.000				
7 Tenure	13.706	10.617	1.000	45.000	0.032	0.079	-0.016	0.165*	0.670*	-0.104	1.000			
8 Extrinsic motivation	3.290	1.262	1.000	6.000	-0.018	0.030	0.195*	0.140	-0.069	0.159*	-0.022	1.000		
9 Informal contacts	5.959	1.095	2.000	7.000	0.321*	0.206*	0.078	0.093	0.037	-0.121	0.085	-0.184*	1.000	
10 Job rotation	2.829	1.820	1.000	7.000	0.134	0.218*	0.031	0.020	-0.097	-0.080	-0.049	0.192*	0.106	1.000

Table 2
Hierarchical moderated regression models (N = 170)^{a,b}.

	Model 0 Control variables	Model 1 Independent variables	Model 2 Hypothesis 1	Model 3 Hypothesis 2
Cooperative climate		0.15** (0.07)	0.15** (0.07)	0.15** (0.06)
Intrinsic motivation		1.15 0.28*** (0.07)	1.15 0.29*** (0.07)	1.15 0.25*** (0.07)
Job autonomy		1.13 0.23*** (0.07)	1.13 0.27*** (0.07)	1.24 0.32*** (0.07)
Cooperative climate* Intrinsic motivation		1.16 -0.20***	1.21 -0.20***	1.33 -0.20***
Cooperative climate* Job autonomy			(0.06) 1.10	(0.06) 1.10 0.12**
Age	-0.07 (0.09)	-0.05 (0.08)	-0.03 (0.08)	-0.02 (0.08)
Education	1.86 0.05 (0.06)	1.89 0.01 (0.05)	1.91 0.00 (0.05)	1.91 -0.00 (0.05)
Tenure	1.07 0.01 (0.01)	1.13 0.00 (0.01)	1.13 0.00 (0.01)	1.13 -0.00 (0.01)
Extrinsic motivation	1.88 0.01 (0.06)	1.96 -0.07 (0.05)	1.96 -0.05 (0.05)	1.97 -0.04 (0.05)
Informal contacts	1.12 0.27*** (0.06)	1.18 0.19*** (0.06)	1.19 0.18*** (0.06)	1.21 0.19*** (0.06)
Job rotation	1.07 0.05 (0.04)	1.13 0.04 (0.04)	1.13 0.04 (0.03)	1.13 0.04 (0.03)
Intercept	1.08 3.94*** (0.52)	1.12 4.79*** (0.48)	1.12 4.76*** (0.47)	1.12 4.66*** (0.47)
N	170	170	170	170
R ²	0.120	0.312	0.354	0.373
Adjusted R ²	0.0878	0.274	0.313	0.330
F-value	3.710	8.071	8.698	8.550
F-test for increment in R ²		14.89***	10.18**	4.93*
Log-Likelihood	-216.8	-195.9	-190.6	-188.0

Standard errors are listed in parentheses and the VIF-values in italics.

^a **** and * indicate significance levels of 0.1%, 1% and 5%, respectively.

^b All independent variables are standardized.

contrast, those employees with greater intrinsic motivation are less influenced by a cooperative climate in their decision to share knowledge.

In order to test Hypothesis 2, we included the interaction effect between cooperative climate and job autonomy in the fourth step

(Model 3). The F-test shows a significant increase in R-squared (F = 4, 93, p < .05), which jumps to 0.37. In support of Hypothesis 2, we found a statistically significant interaction between cooperative climate and job autonomy ($\beta = 0.12$, p < .05), indicating that the positive effect of a cooperative climate on knowledge sharing is

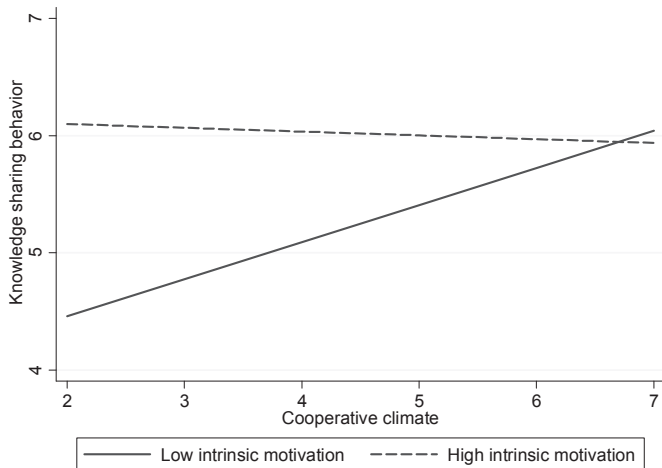


Fig. 2. Two-way interaction between cooperative climate and intrinsic motivation.

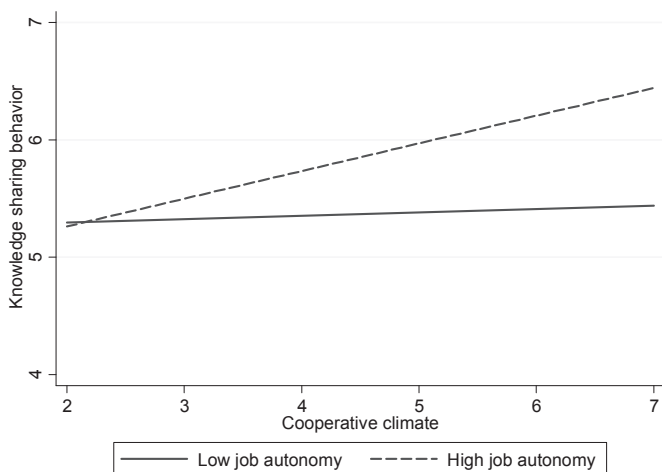


Fig. 3. Two-way interaction between cooperative climate and job autonomy.

stronger when employees have high levels of job autonomy. As with intrinsic motivation, we plotted the simple slopes for the relationship between a cooperative climate and knowledge sharing at one standard deviation above and below the mean of job autonomy (Fig. 3).

The figure shows that knowledge sharing behavior increases when both the social climate for cooperation and job autonomy are high. The dotted line shows that employees with high levels of autonomy are more influenced by a cooperative climate. In contrast, the effect of a cooperative climate is weaker for employees with low levels of job autonomy.

5. Concluding discussion

Previous research has found that HRM practices are closely intertwined with intraorganizational knowledge sharing (Cabrera & Cabrera, 2005; Minbaeva, Foss, & Snell, 2009). Empirical research in the field has identified relevant factors that impact knowledge sharing, such as the reward system, the organizational climate or the availability of IT tools for knowledge sharing purposes. Although these studies have provided valuable insights on how HRM practices can be designed to promote knowledge sharing, important gaps remain in the

literature (Foss & Michailova, 2009). For example, in much of the literature there is a proliferation of a macro (organization) level constructs and perspectives which can be problematic because the micro-mechanisms that mediate between HRM practices and observed knowledge sharing outcomes are not identified and observed. This makes it more difficult to make informed interventions.

In this context, the first contribution of this paper is related to the moderating role of intrinsic motivation in the relationship between cooperative climate and knowledge sharing. Results indicate that cooperative climate and intrinsic motivation are substitutes with respect to predicting employees' knowledge sharing behaviors, thus suggesting that a cooperative climate can serve as a supplementary source of motivation for those employees who do not show a natural interest towards knowledge sharing. The second contribution discuss the relevance of job design. In particular, we developed and tested the argument that granting employees increasing levels of autonomy will strengthen the positive influence of a cooperative climate on their decisions to share knowledge. Results presented here suggest that job design features play a role in strengthening the potential positive effects of a cooperative climate in organizations. This is good news for managers, given that a managerial interventions through job design is likely to be less costly than an attempt to shape the social climate of the organization or department.

5.1. Theoretical implications

The results yield a number of theoretical implications that build upon and clarify prior research. This research is framed on the recent stream of person/situation interaction studies in organizational behavior research (Bogaert et al., 2012). First, we contribute to the HRM field, which has paid increased attention to the design of managerial interventions to foster intra-organizational knowledge sharing (Fong et al., 2011; Gagné, 2009). Although research has established that HRM practices can influence employee's behaviors through its impact in the organizational climate (Smith et al., 2005), few studies on HRM and knowledge sharing have considered the contingent effect of the cooperative climate. Our primary contribution lies in the idea that this effect is not evenly distributed across individuals when intrinsic motivation and job autonomy are considered. That implies that too much effort in promoting a cooperative climate in the organization may overlook the fact that some employees are naturally attracted towards knowledge sharing even without the existence of a supporting climate. Second, we contribute to the KM literature. Within this field, there is an increasing interest in unpacking the micro-foundations of intra-organizational knowledge sharing processes (Foss, Husted, & Michailova, 2010) by adopting a contingent perspective of knowledge sharing behaviors (Wang & NOE, 2010). By treating as contingents two factors that have been previously conceived as direct predictors of knowledge sharing (namely, intrinsic motivation and job autonomy) (Osterloh & Frey, 2000), our work suggest that the effects of cooperative climate is not homogeneous among all employees. Such an approach echoes the idea that intra-individual differences in these two dimensions may reinforce or diminish the influence of organizational contingencies in the employees' propensity to share knowledge.

5.2. Managerial implications

Beyond the theoretical contributions, the effects we uncover are also meaningful from a managerial standpoint. Managers' understanding of how the effect of a cooperative climate may be

moderated by individual characteristics and job features may be helpful in developing more effective HRM policies. Specifically, by recognizing that a cooperative climate has diverse effects for different employees, managers may better adjust the level of the relevance of a cooperative climate in promoting knowledge sharing. Rather, our findings suggest that it may be important for managers to attend employees' intrinsic motivation and job autonomy as a way to maximize the potential gains of a cooperative climate in the organization.

Specifically, our results indicate that, in a group solely composed by employees low in intrinsic motivation to share knowledge, managerial interventions to promote a cooperative climate becomes essential to enhance intra-group knowledge sharing. Conversely, groups composed by employees with a higher natural tendency to share knowledge would not require such a managerial intervention to do so. Actually, in a group where intrinsic motivation towards knowledge sharing is already high, a managerial intervention may be potentially harmful. The question of how design managerial interventions to influence intrinsic motivation has been a long-standing concern, since intrinsically driven behaviors may be compromised when environments are perceived as normative or when extrinsic rewards undermine the individuals' internal locus of causality. In light of our results, we suggest that potential pervasive effects of shaping the organizational climate can be reduced if managers ensure that such interventions are actually needed to promote knowledge sharing. This managerial implication should be considered in light of the fact that employees within the same organization may exhibit divergent motivations. Given this, managers should evaluate if, for example, the tasks carried out by employees that are high in intrinsic motivation are somehow less important for the organization than those carried out by employees that are low in such motivation. If that is the case, then a managerial intervention aimed at increasing cooperative climate may make sense, even if it potentially harms the motivation of those employees that are high in intrinsic motivation.

Another important implication concerns the influence of job autonomy. This research suggests that management can directly strengthen the impact of a cooperative climate on knowledge sharing by providing employees with high levels of job autonomy. We argue that increased levels of discretion about how to perform tasks permits employees to be more active in knowledge-sharing activities. Given the extra-role nature of engaging in knowledge sharing, job autonomy allows employees to benefit from a cooperative climate by engaging in knowledge sharing. To the extent that providing employees with higher levels of autonomy is likely to be easier than shaping the organizational climate, managers should ensure that employees have enough autonomy to enable them to benefit from a cooperative climate. Thus, jobs may be designed to let employees to take advantage of being in a cooperative group. For example, when employees are provided with few specific instructions to perform their jobs, they are implicitly obligated to engage in knowledge-sharing practices in order to find efficient ways to carry out their tasks.

6. Limitations and future research

This research is subject to a number of limitations. First, although our study suggests a causal relation between organizational climate and knowledge sharing, our cross-sectional data do not rule out the possibility of alternative causal pathways. Hence, future research using experimental or longitudinal designs is recommended to examine the direction of causality.

Furthermore, we focus only on the cooperative climate, while researchers emphasize that organizational climate can take multiple forms (Schneider & Reichers, 1983). Therefore, we encourage researchers to investigate how other types of organizational climates interact with employees' intrinsic motivations and job design. We expect that the more normative the climate is with respect to cooperation, the more linked it will be to knowledge sharing for low intrinsically motivated employees because these employees will feel a sense of obligation arising from the group. On the other hand, a more normative climate may have negative effects for more intrinsically motivated employees due to crowding-out effects (Lam & Lambermont-Ford, 2010). In this sense, research indicates that employees' intrinsic motivation decreases when they perceived that their internal locus of causality is compromised by external pressures (Deci & Ryan, 1985; Osterloh & Frey, 2000). Hence, putting too much emphasis in promoting a cooperative climate might have counterproductive effects on employees with high intrinsic motivation to share.

It is also important to note that decreasing managerial efforts towards building a cooperative climate may have negative consequences in other spheres of the organization. For instance, research recognized that cooperative climates are positively associated to perspective taking and engaging in other kinds of helping behavior than knowledge-sharing. Given that, these consequences should be considered for HRM when evaluating potential benefits and costs associated to investing in a cooperative climate.

With regard to job autonomy, we suggest that researchers explore the interactive nature of autonomy under different types of organizational climates. In addition, in focusing on job autonomy, we did not examine other job characteristics that might affect the relationship between climate and behavior. HRM scholars may be interested in a broader examination of different job designs and their interactions with the cooperative climate. Additionally, future research might blend our results with research on how organizational learning aspects such as risk-taking and experimentation are related to intra-organizational knowledge sharing (Alegre & Chiva, 2008).

Our conceptualization of intrinsic and extrinsic motivation is based on self-determination theory. One of the strengths of this theory is that it differentiates among a range of motivations based on the perceived locus of causality. These motivations have been argued to influence behavior in different ways. However, this study does not capture this motivational diversity. Hence, future research may focus on how the climate affects individuals with specific types of motivations and whether, for instance, a cooperative climate can be used to internalize the motivation to share knowledge. Finally, our findings are derived from a limited number of responses from a single firm. Thus, conclusions drawn from our results should be generalized with care. It would be worthwhile for further research to test whether our results can be generalized to other organizations or industries, and to explore the extent to which our results can be applied to other organizational behaviors, such as helping or volunteering.

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Appendix

Table A.1
Constructs, Items And Factor Loadings.

	Factor loading	Cronbach alpha	Construct reliability	Average Variance extracted
Knowledge sharing behavior				
To what extent ...?		0.74	0.84	0.57
1. Colleagues in your own project used knowledge from you?	0.87			
2. Colleagues in your own project received knowledge from you?	0.86			
3. Have you received knowledge from colleagues in your own project?	0.58			
4. Have you used knowledge from colleagues in your own project?	0.55			
Cooperative climate				
To what extent do you agree with the following statements?		0.72	0.84	0.64
1. Employees in my department perceive each other as competitors ^a	0.80			
2. Employees in my department cooperate well with each other	0.78			
3. Employees in my department prefer to create own knowledge rather than reusing others ^a	0.71			
Intrinsic motivation to share knowledge				
I share knowledge with others because ...		0.75	0.85	0.66
1. I find it personally satisfying	0.83			
2. I enjoy doing so	0.76			
3. I like sharing knowledge	0.67			
Job autonomy				
To what extent is your current job characterized by the following?		0.74	0.85	0.64
1. The opportunity for independence and individual initiative	0.85			
2. The freedom to carry out my job the way I want to.	0.83			
3. High levels of task variety	0.56			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

^a Item was reverse-coded for building the scale.

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