The Role of Leadership in the Management of Conflict and Knowledge Sharing in the Research Groups of a Spanish Public University

José L. Ballesteros-Rodríguez[1] · Nieves L. Díaz-Díaz[2] ·
Inmaculada Aguiar-Díaz[2] · Petra De Saá-Pérez[1]

Abstract

This paper analyses how academics perceive their group leaders' behaviour in managing the scientific activities of their research group and, particularly, how the leader's style (task- or relationship-oriented) enhances knowledge sharing, both directly and indirectly through its influence on conflict. An empirical research study was carried out by surveying 211 academics belonging to research groups in a Spanish university, using simultaneous equation models. The results provide evidence that both leadership styles have a positive and significant direct influence on knowledge sharing, as well as an indirect effect by reducing the negative influence of task and relationship conflict.

Keywords Leadership · Knowledge sharing · Conflict · Research groups · Public University

Introduction

In recent years, universities around the world have changed considerably due to the strong competitive pressures produced by the growing influence of rankings. They also continuously undergo audits and performance evaluations (Travaille and Hendriks 2010). In addition, they have to address problems related to rapid and dynamic changes in technologies and the diversification of knowledge in terms of multidisciplinary and

✉ José L. Ballesteros-Rodríguez
  joseluis.ballesteros@ulpgc.es

[1] Departamento Economía y Dirección de Empresas, Universidad de Las Palmas de Gran Canaria, Campus de Tafira, 35017 Las Palmas de Gran Canaria, Spain

[2] Departamento Economía Financiera y Contabilidad, Universidad de Las Palmas de Gran Canaria, Campus de Tafira, 35017 Las Palmas de Gran Canaria, Spain

multinational concerns (Lauring and Selmer 2011). This new competitive environment, referred to by Degn et al. (2018) as "academic capitalism", also affects research groups within universities because they are increasingly pressured to obtain measurable results.

In this new context, more attention should be paid to understanding which management practices within public universities help to increase their productivity (Degn et al. 2018). However, research carried out at universities largely depends on effective collaboration among academics (Lauring and Selmer 2011), and this, in turn, depends on their exchange of knowledge (Tan 2016). Moreover, it is important to focus on the organizational level, where the exchange of knowledge is truly relevant for scientific production. According to Travaille and Hendriks (2010), the success processes related to the Nonaka's SECI model of knowledge occur at the research group level rather than at the research institute level. Nevertheless, in collaboration processes, the main determinants for not achieving success when sharing knowledge could be rooted in the lack of an adequate motivation policy and other issues related to human resource management (Jimenez-Jimenez and Sanz-Valle 2013). In this regard, it should be taken into account that research group leaders in Spanish public universities have autonomy when managing their research teams and projects, which is a fundamental element in assuming responsibilities related to the management of human resources (Knies and Leisink 2014).

Research group members usually share research problems with their colleagues, seeking answers in interactive face-to-face communication (Tan 2016). However, researchers must know and trust each other in order to exchange their knowledge (Nistor et al. 2015). For this reason, it is critical to understand the underlying effects of the collaboration between a researcher and his/her group members, as well as the influence of these effects on the members' willingness to share knowledge with others (Liu et al. 2011).

Travaille and Hendriks (2010) draw attention to the management of the research group environment because, through knowledge sharing, creative chaos can be stimulated. In order to be creative, researchers need to consider other ideas and learn how to take different perspectives (Jiang et al. 2016; Schulz-Hardt et al. 2002). However, they also need to have certain interpersonal relationships with their colleagues (Fullwood et al. 2013), so that they can improve communication and cooperation (Lu et al. 2011). Thus, group leaders should sometimes prioritize a decrease in the group's internal tensions (Degn et al. 2018). Knowledge sharing can be fostered if leaders show certain behaviours related to knowledge management activities (Lee et al. 2010), convincing their group members that the exchange of ideas and open debate are beneficial for everyone, even in terms of publications and citations (Tian et al. 2009). Leaders can also help by reducing hoarding behaviour, which generates high levels of conflict, and trying to inspire group members to share knowledge (Bai et al. 2016).

Taking these considerations into account, the objective of this paper is to analyse the influence of the academic research group leader on the level of knowledge sharing, both directly and indirectly through his/her influence on conflict. To this end, an empirical research study was carried out by surveying 211 academics who belonged to research groups in a Spanish public university. The results provide evidence that leaders' behaviours (task- or relationship-oriented) have a direct, positive, and significant effect on knowledge sharing, as well as an indirect effect by reducing the negative effect of high levels of task and relationship conflict. Unlike other studies that have

explained knowledge management in universities in terms of the benefits researchers can obtain (e.g., Fullwood et al. 2013), this study contributes to the literature by studying not only the factors that can influence knowledge sharing among researchers, but also the way these factors interact.

Theoretical Framework

Leadership and Knowledge Sharing

Knowledge sharing refers to deliberate interpersonal interaction processes, such as discussions, exchanging ideas, or joint problem solving, where knowledge is exchanged (Matzler et al. 2011; Minbaeva et al. 2012). In academic institutions, researchers obtain much of their knowledge through interactive face-to-face communications, rather than from written documents (Tan 2016). The main contribution of knowledge-sharing processes is to make existing knowledge within organizations and individuals available to others (Jimenez-Jimenez and Sanz-Valle 2013; Lu et al. 2011). In this regard, several researchers highlight that knowledge sharing leads to better performance within groups (e.g., He et al. 2014; Lee et al. 2010).

In many cases, knowledge sharing is based on an individual's voluntary act, and it is always under the individual's control (Sandhu et al. 2011; Swart et al. 2014). However, group members may have reasons for not making their knowledge available to others, treating their own knowledge as a valuable and sensitive asset that must be carefully handled (He et al. 2014). In the university context, research is motivated by the individual objectives of the researchers, who may be reluctant to share their knowledge (Tian et al. 2009). Group members not only choose whether or not to share knowledge, but also with whom (Zboralski 2009). Nevertheless, although it has been suggested that individuals show anxiety when their knowledge is exposed to influences and needs coming from outside (Swart et al. 2014), there is evidence of academics' positive attitudes and intentions to share knowledge (Fullwood et al. 2013). The aforementioned arguments show the difficulty of managing the knowledge-sharing process, which cannot be arbitrary (He et al. 2014).

Achieving a competitive advantage through knowledge management is highly dependent on the type of leadership deployed in the organization (Singh 2008). According to Nistor et al. (2015), in order to generate the necessary trust to share knowledge, there must be a basic organizational structure that makes it possible to establish some minimum group norms, and the leader can perform this role. Along these lines, Tian et al. (2009) emphasize the role of university laboratories' leaders, who should promote a culture that fosters knowledge sharing. Leaders must convince their group members that the exchange of ideas and open debate are beneficial for everyone, even in terms of publications and citations (Tian et al. 2009). Leaders can help to eliminate hoarding behaviour and try to inspire group members to share. Thus, knowledge sharing can be fostered if leaders have certain behaviours directly related to knowledge management activities: monitoring the environment for relevant new knowledge in order to share it within the group; challenging group members to try new approaches to problems; and pairing experienced individuals with less experienced members (Lee et al. 2010). As Bai et al. (2016, p. 3248) point out, "a leader's behaviour does play a critical role in facilitating knowledge sharing and individual creativity".

From a behavioural perspective, leadership styles can be divided into two categories: task- or relationship-oriented. On the one hand, a task-oriented leader deals with task accomplishment and facilitates the understanding of task requirements, operating procedures, and the acquisition of task information (Salas et al. 1992). This style is characterized by leader behaviours that "[…] emphasize the accomplishment of task objectives via the minimization of role ambiguity and conflict" (Burke et al. 2006, p. 292). On the other hand, a relationship-oriented leader facilitates behavioural interactions, cognitive structures, and attitudes that must be developed before members can work effectively as a team. This kind of leader shows concern and respect for his followers, looks out for their welfare, and expresses appreciation and support (Bass 1990). Burke et al. (2006, p. 303) found that both leadership styles "[…] are almost equally important in team effectiveness and explain significant amounts of respective variance in team productivity". These arguments lead to the following hypotheses:

H1: Task-oriented leadership has a positive effect on knowledge sharing in research groups.

H2: Relationship-oriented leadership has a positive effect on knowledge sharing in research groups.

Conflict and Knowledge Sharing

In universities, academics collect and contribute knowledge in different moments and contexts, for example "while teaching and co-teaching, commenting on papers by colleagues or in blind review processes, advising younger researchers, working with co-authors, participating in academic management meetings, attending conferences and colloquia, having conversations over lunch" (Berthoin Antal and Richebé 2009, p. 84). Sharing knowledge means that researchers have to invest time and effort in encouraging the flow of knowledge among their group members, who have different types of specialized expertise (Grant 1996). This process enhances group conflict when members discuss their different points of view using arguments and counterarguments (Jiang et al. 2016). Conflict has been considered one of the main challenges of group work because each group member provides task inputs and relationship inputs, with task and relationship conflict emerging (De Dreu and Weingart 2003; Jehn et al. 2008). Task conflict is a perception of disagreement among group members about the content of their decisions, and it involves differences in viewpoints, ideas, and opinions about the task being performed. Relationship conflict is a perception of interpersonal incompatibility among individuals, related to disagreements about values and personal issues (Jehn 1997; Jehn et al. 2008).

The effects of both types of conflict can be seen in group members' moods, which may be expressed as negativity, irritability, and resentment on a personal level. These mind states cause individuals to waste time on activities aimed at reducing threats and increasing their share of power (Jehn 1997). However, although conflict has generally been viewed as negative, a certain type of conflict could be beneficial. In recent years, some authors have proposed that, in certain circumstances, task conflict can be beneficial to team effectiveness because people are presented with other ideas and learn how to take different perspectives in order to be creative (Schulz-Hardt et al.

2002; Simons and Peterson 2000). Groups that experience task conflict tend to make better decisions because this conflict encourages greater cognitive understanding of the issue being considered and the acceptance of group decisions, and it prevents group-think (Simons and Peterson 2000). Bai et al. (2016, p. 3240) state that "task conflict could contribute to employee knowledge sharing and creativity by triggering an exchange of information and an exploration of diverse and even opposing opinions". However, if the level of task conflict becomes so intense that information processing is blocked, this positive effect is reduced (De Dreu and Weingart 2003). As De Dreu and Weingart (2003, p. 741) point out, "a little conflict stimulates information processing, but as conflict intensifies, the cognitive system shuts down, information processing is impeded, and team performance is likely to suffer". Thus, if task conflict is not well managed, it can also be destructive to knowledge sharing (Bai et al. 2016; De Dreu and Weingart 2003; Jiang et al. 2016; Simons and Peterson 2000).

Although it is clear that knowledge-sharing processes have a cognitive nature, it must also be recognized that they have an important relationship component (Lu et al. 2011). For knowledge sharing to exist, there must be emotional ties linking the group members (van Woerkom and Sanders 2010). Knowledge-sharing processes require the individuals' engagement, which makes them highly sensitive and justifies the shift toward more people-centred approaches for their study (Matzler et al. 2011). A positive attitude towards knowledge sharing requires the presence of social relationships based on trust, but at the same time, relationship conflict can eliminate the possibility of this presence (Xue et al. 2011). Relationship conflict hinders open communication and fosters hostility and suspicion about others' ideas and arguments, and these behaviours will drastically reduce the group's information processing ability (De Dreu and Weingart 2003; Kotlyar and Karakowsky 2007). Thus, the following hypotheses are formulated:

H3:   Task conflict has an inverted-U effect on knowledge sharing in research groups
H4:   Relationship conflict has a negative effect on knowledge sharing in research groups

Leadership and Conflict

The research group's performance is closely related to the leader's behaviour because some members may be linked to the research group for a relatively short time, focus mainly on scientific issues, and not have much of an opportunity to get to know each other (Nistor et al. 2015). In this context, conflict is inherent to the interactions that occur within a group. But this conflict does not appear spontaneously or unjustifiably; it has a foundation, and the way the leader manages it will have an important impact on the group's performance (Zhang et al. 2011). This means that the leader has the opportunity to use his/ her influence to minimize the presence of conflict and its level of intensity when it appears (Kotlyar and Karakowsky 2007).

According to Kotlyar and Karakowsky (2007), the leader has the difficult and delicate duty of trying to prevent the emergence of relationship conflict. The leader can manage his/her followers' emotions, so that they can show appropriate conduct that

will lead them to enjoy a positively appraised work environment, which in turn will help the group's effectiveness. Therefore, the leader should try to keep relationship conflict from becoming chronic within the group because it could have devastating effects on the group's functioning and productivity (Jehn 1997; Tjosvold 2006). Furthermore, once relationship conflict has appeared, the generation of productive task-conflict through healthy debate might be inviable (Kotlyar and Karakowsky 2007).

Leaders must help members to minimize the likelihood of reaching dysfunctional conflicts, seeking a good group environment that can stimulate creative chaos (Travaille and Hendriks 2010). In this regard, Ayoko and Callan (2010, p.223) point out that "the behaviours of the leader can assist in setting boundaries around inappropriate emotional play in the team which may reduce the frequency of conflict while preventing conflict escalation". This aim can be achieved through different leadership styles or behaviours. Leaders with task-oriented behaviour often serve as examples for team members, reducing the negative consequences of task conflict by focusing on goal achievement and establishing well-defined patterns of communication (Bai et al. 2016; Tabernero et al. 2009). Moreover, team members who perceive a greater task-oriented leadership style experience positive emotions toward their colleagues more frequently, thus reducing relationship conflict (Bono et al. 2007). By contrast, a leader's relationship-oriented behaviour will help to maintain or control an appropriate level of conflict by establishing good interpersonal relationships within the team in order to prevent both task and relationship conflicts (van Woerkom and van Engen 2009) (Fig. 1). Thus, the following hypotheses are proposed:

H5: Task-oriented leadership has a negative effect on conflict in research groups
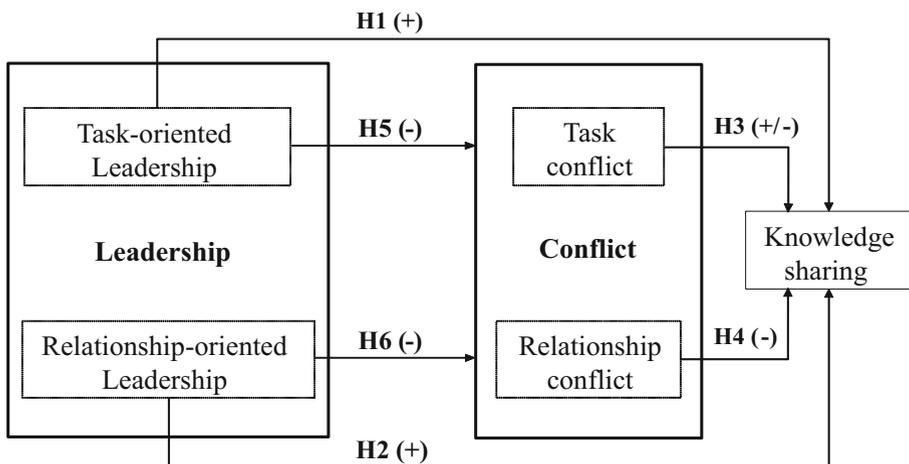H6: Relationship-oriented leadership has a negative effect on conflict in research groups

Fig. 1 Proposed model

Methodology

Sample

To achieve the proposed objectives, an empirical study was conducted at a Spanish university. The population of the study was composed of researchers in the university, and it was restricted to those who belonged to a research group. Researchers who were group leaders were excluded. Data for the study were collected through primary sources. Thus, information on leadership, conflict, and knowledge sharing among the members of a research group was obtained through a questionnaire sent out to all the researchers in the population through institutional e-mail. Three reminders were sent to increase the response rate, and a hard copy of the questionnaire was subsequently sent to researchers who had not replied. Thus, 242 researchers participated in the study. However, questionnaires with incomplete information were eliminated, and so the final sample consisted of 211 questionnaires from researchers belonging to 94 groups.

Measurement

The design of the questionnaire was based on a review of the literature, resulting in several seven-point Likert-type scales, ranging from 1 (strongly disagree) to 7 (strongly agree), to measure the variables included in the study.

Knowledge sharing was measured with a scale based on previous work (Chow and Chan 2008; Liu et al. 2011), where each researcher valued the level of knowledge shared among the members of his/her research group during the period of the study. Some examples of items are: "The members of the research group shared the results of our research with each other (new articles, projects, etc.)"; or "The members of the research group usually told each other if they were undertaking any research activity that could facilitate the others' work". Confirmatory Factor analysis showed the existence of one factor that accounted for 77.2% of the variance. This scale showed a Cronbach's alpha of 0.97.

Leadership was measured taking as reference the scale developed by Hemlin (2006) in the context of research groups, but adapted to enhance the task or relationship orientation of the leader. In order to reduce the dimensions of the scale, a confirmatory factor analysis with varimax rotation was carried out, reflecting the existence of the two expected dimensions (*Task-oriented leadership* and *Relationship-oriented leadership*). A sample item from the task-oriented leadership scale is: "The leader of my research group knows what to do if working problems arise"; and an item from relationship-oriented leadership scale is: "The leader of my research group gets on well with the group members". They accounted for 83.80% of the total variance. All loadings exceeded 0.78, and the Cronbach's alphas value for the factors were 0.96 and 0.91, respectively.

Conflict was measured with an adaptation of the scale developed by Jehn and Mannix (2001) to more closely reflect task and relationship conflict. A sample item from the scale was: "There were often conflicting opinions regarding projects to be addressed by the research group". It should be kept in mind that individuals from the same group may have different views of the degree of conflict due to personal traits and situations. For this reason, in the present study, respondents were asked about their

perceptions of conflict in the group (see Lu et al. 2011 for an in-depth review). A factor analysis confirmed the existence of the two expected dimensions: *Task conflict* and *Relationship conflict*. Both factors jointly accounted for 78.2% of the variance. Cronbach's alpha value were 0.93 and 0.92, respectively.

Additional variables were included to control the influence of the characteristics related to the researchers and their teams that can also affect knowledge sharing. The control variables included the researcher's age (*age*), measured with three dummy variables: under 40 years of age (reference in models), between 40 and 50, over 50 (Pezzoni et al. 2012). The researcher's gender (*gender*) was included as a dummy variable, with the value of 1 if the researcher was female (Pezzoni et al. 2012). Differences in performance due to the researcher's academic rank (*academic_rank*) were controlled with 5 dummy variables: Professor (omitted in the models), Associate Professor, Tenured Lecturer, Assistant Professor, and Teaching Assistant (Rotolo and Messeni-Petruzzelli 2013). In this regard, another variable (*nsexenios*) that considers the number of six-year periods of officially recognized research for each researcher was also included. Team size (*team_size*) was considered using the logarithm of the number of members of each research team (Forti et al. 2013). Finally, *Knowledge area* is considered through five dummy variables that adopt the value of 1 if the team belongs to a specific area: Arts and Humanities, Social and Law Sciences, Sciences, Health Sciences, and Engineering and Architecture.

Data Analysis

Simultaneous equation models using three-stage least squares (3SLS) were employed in the estimation. A system of three simultaneous equations was specified. *Knowledge sharing* is the dependent variable in the first Eq. (1), and it includes the effect of two endogenous variables (*Task conflict* and *Relationship conflict*). *Task-oriented leadership* and *Relationship-oriented leadership* are key explanatory variables of interest in this equation, which also includes control variables that might affect researchers' knowledge sharing. The second Eq. (2) considers the endogenous variable (*Task conflict*) as the dependent variable, and it includes a set of control variables. Both types of leadership also appear as key explanatory variables of interest. Finally, the third Eq. (3) considers the endogenous variable (*Relationship conflict*) as the dependent variable, and it includes a set of control variables. Again, both types of leadership are the key explanatory variables of interest. Both conflict variables are considered endogenous and are simultaneously determined. The rest of the variables are exogenous.

$$
\begin{aligned}
\text{Knowledge Sharing} = {}& \beta_0 + \beta_1 \text{Task-oriented Leadership}_i + \beta_2 \text{Relationship} \\
& \text{-oriented Leadership}_i + \beta_3 \text{Task conflict}_i + \beta_4 \text{Task conflict}^2_i \\
& + \beta_5 \text{Relationship conflict}_i + \beta_6 \text{Team Size}_i + \beta_7 \text{Team Size}^2_i \\
& + \beta_8 \text{nsexenios}_i + \varepsilon_i i = 1, \ldots, 211
\end{aligned}
\tag{1}
$$

$$
\begin{aligned}
\text{Task conflict}_i = {}& \beta_0 + \beta_1 \text{Task-oriented Leadership}_i + \beta_2 \text{Relationship} \\
& \text{-oriented Leadership}_i + \beta_3 \text{Team Size}_i + \beta_4 \text{nsexenios}_i \\
& + \beta_{5-8} \text{Knowledge area}_i + \varepsilon_i i = 1, \ldots, 211
\end{aligned}
\tag{2}
$$

$$\begin{aligned} \text{Relationship conflict}_i = {} & \beta_0 + \beta_1 \text{Task-oriented Leadership}_i + \beta_2 \text{Relationship} \\ & -\text{oriented Leadership}_i + \beta_3 \text{TeamSize}_i + \beta_{4-7} \text{academic\_rank}_i \\ & + \beta_{8-9} \text{Age}_i + \beta_{10} \text{Gender}_i + \varepsilon_i i = 1, ..., 211 \end{aligned} \quad (3)$$

The system of equations presents endogenous variables. Estimation by Ordinary Least Squares (OLS) could obtain biased or inconsistent estimators. Consequently, instead of using OLS and two-stage least squares (2SLS) to test the hypotheses, a simultaneous equations approach using three-stage least squares (3SLS), which addresses problems of potential endogeneity and cross-correlations between equations, was estimated (Greene 2012). Model estimation was carried out with the econometric programme STATA 11.

Harman's one-factor test was conducted to empirically address the threat of common method variance (Podsakoff and Organ 1986). Three factors emerge explaining 77.02% of the variance, with the first factor accounting for 29.73% of the variance. Accordingly, common method variance does not appear to be a problem in this study. Moreover, regarding the explanatory variables, there are no multicollinearity problems because the VIF (Variance Inflation Factor) values are less than five in all cases.

Results

Table 1 presents the results obtained from the 3SLS estimation to test the hypotheses related to the direct and indirect effects of leadership on knowledge sharing. The results of Eq. 1 reveal that a task-oriented leadership style by the research groups' leaders has a positive and significant effect ($\beta = 0.461$; $p < 0.01$) on knowledge sharing. Thus, the higher the task-oriented leadership, the higher the value of the knowledge shared among the researchers, supporting hypothesis H1. On the other hand, the results of Eq. 1 also show a positive and significant influence of the relationship-oriented leadership style on knowledge sharing within research groups ($\beta = 0.739$; $p < 0.01$). These results support hypothesis H2.

Results show that there is a non-linear relationship (positive/negative) between task conflict and knowledge sharing (see Table 1). The linear coefficient of the task conflict variable is positive and significant ($\beta = 2.077$ $p < 0.001$ in Eq. 1), whereas the coefficient of the quadratic term is negative and significant ($\beta = -0.423$ $p < 0.05$ in the same equation). Thus, up to a certain level of task conflict, the knowledge shared among the researchers increases. However, above that level, a higher level of this type of conflict has a negative effect on the knowledge shared among the research group's members. By contrast, the results also reveal that relationship conflict among the researchers has a negative and significant effect on their knowledge sharing ($\beta = -1.265$; $p < 0.05$). These results support hypotheses H3 and H4.

Finally, the results of Eq. 2 indicate that task-oriented leadership negatively and significantly influences task conflict, whereas the results of Eq. 3 show that this type of leadership influences relationship conflict in the same way. Therefore, these results support hypothesis 5. Similarly, the results show that relationship-oriented leadership

Table 1 Effect of leadership on conflict and knowledge sharing in academic research groups

	β	S.E.
Equation 1. Knowledge sharing		
Task-oriented leadership	0.461***	(0.160)
Relationship-oriented leadership	0.739***	(0.255)
Task conflict	2.077***	(0.625)
Task conflict2	−0.423**	(0.200)
Relationship conflict	−1.265**	(0.519)
Team size	−0.076**	(0.035)
Team size2	0.001*	(0.001)
nsexenios	−0.043	(0.091)
Constant	0.909**	(0.376)
Chi² Statistic	112.47***	
Equation 2. Task conflict		
Task-oriented leadership	−0.145**	(0.067)
Relationship-oriented leadership	−0.539***	(0.068)
Science area	0.222	(0.165)
Health sciences area	0.268*	(0.153)
Social sciences area	0.309**	(0.141)
Engineering and architecture area	0.323*	(0.184)
Team size	−0.002	(0.006)
nsexenios	0.107*	(0.058)
Constant	−0.216	(0.136)
Chi² Statistic	94.16***	
Equation 3. Relationship conflict		
Task-oriented leadership	−0.205***	(0.070)
Relationship-oriented leadership	−0.325***	(0.071)
Team size	−0.009	(0.006)
Associate Professor	0.117	(0.216)
Tenured Lecturer	0.006	(0.264)
Assistant Professor	0.007	(0.240)
Teaching Assistant	0.246	(0.267)
Age: from 40 to 50	−0.080	(0.132)
Age: more than 50	−0.221	(0.167)
Gender	0.114	(0.102)
Constant	0.124	(0.264)
Chi² Statistic	47.48***	

Significant to $p < 0.01$: ***; $p < 0.05$**; $p < 0.1$*

Estimation method: Three-stage Least Squares (3SLS)

S.E.: Standard errors

significantly and negatively influences both task conflict (Eq. 2) and relationship conflict (Eq. 3), thus supporting hypothesis 6.

The results of the estimated model support the hypotheses related to the effect of leadership on knowledge sharing, highlighting the direct and indirect effect of leadership. The findings suggest that the leadership style has two positive effects on knowledge sharing. First, researchers in groups with strong leadership share more knowledge than researchers in groups without this characteristic. Second, researchers within groups with strong leadership reduce conflict in order to share knowledge appropriately. The results reveal that the leadership style may help researchers in a group to manage conflicts for their mutual benefit and achieve higher values of knowledge sharing.

Regarding the control variables, the results show that team size has a negative effect on knowledge sharing up to a certain level, when it becomes positive (Eq. 1 in Table 1). The results also show that the knowledge areas of Social and Law Sciences, Health Sciences, and Engineering and Architecture have a positive effect on task conflict, compared to Arts and Humanities, which is omitted from the model (Eq. 2 in Table 1). In addition, there is a positive and significant relationship between the number of six-year periods of officially recognized research in the group and the level of task conflict (Eq. 2 in Table 1).

Discussion-Conclusion

This paper examines the role of leadership in knowledge sharing within research groups in a Spanish public university, both directly and indirectly through its influence on conflict. Knowledge sharing has become an element of interest for all kinds of organizations that try to build on knowledge to achieve a competitive advantage. This interest is even greater in organizations such as universities because their purpose is the creation and transfer of knowledge. Unlike other studies that have explained knowledge sharing in terms of benefits that researchers could gain from being involved in these kinds of practices (e.g., Fullwood et al. 2013), this paper analysed the influence of task- and relationship-oriented leadership on knowledge sharing, as well as their impact on task and relationship conflict, which may hinder knowledge sharing within the group. Thus, this study contributes to filling the gap identified by Merat and Bo (2013), who considered that when studying the knowledge exploitation capability, researchers have tended to focus on identifying the factors that can influence it, but they have somehow ignored the way this effect occurs. The results provide evidence that leaders' behaviours (task- or relationship-oriented) have a direct, positive, and significant effect on knowledge sharing, as well as an indirect effect by reducing the negative effect of high levels of task and relationship conflict.

The results show that leaders can play a pivotal role in knowledge-sharing activities within research groups in public universities because they can create an environment of positive interactions among group members in order to facilitate knowledge-sharing activities, which, in turn, contribute to the creation of new knowledge (Rotolo and Messeni-Petruzzelli 2013). In this regard, this study deepens the understanding of how group leaders can play the role of facilitator and mentor in knowledge sharing (Burke et al. 2006; Tabernero et al. 2009). Knowledge sharing can be encouraged by fostering social interactions and stimulating interpersonal relationships that minimize conflict and improve proper behaviours among group members (Bai et al. 2016). These results,

in agreement with suggestions of other authors, shed light on the mechanisms that explain knowledge sharing in research groups (e.g., Hemlin 2006; Minbaeva et al. 2012; Xue et al. 2011; Zboralski 2009).

Despite its strengths, this study also has some limitations. First, caution should be used when generalizing the results of this study because it was based on a single public university. Future research in different work settings is needed to replicate its findings. In fact, in collectivist cultures, the effect of conflict on work-related behaviours could be different from its effect in more individualistic cultures (Lu et al. 2011). Furthermore, data were collected from a single source, and it would be worthwhile to have more information sources. There are also many variables that influence knowledge sharing that were not included in our research, such as remuneration and career advancement systems, among others. In addition, although the respondents were asked to evaluate their research group over a period of time, the data refer to a specific moment in time, and so it would be interesting to conduct longitudinal studies that lead to more in-depth conclusions about causality between the variables.

Conclusion

This study shed light to understanding the knowledge management process in the public sector in general, as Jain and Jeppesen (2013) proposed, and in universities in particular. Managers in private companies have different tools and mechanisms to promote knowledge management practices in their organizations that may not be available to those who occupy similar positions in public organizations. The findings of the present study can be useful because, although work in universities still has a highly individualistic component (Tian et al. 2009), there is a tendency to move toward more group-based forms of research production (Hemlin 2006). Thus, the proper management of knowledge sharing in research groups can benefit management processes in universities as knowledge creation and dissemination centres. It should be noted that knowledge sharing has positive connotations for academics, who tend to view it as a valuable experience and a wise move, as well as a pleasant experience. In other words, researchers believe that engaging in knowledge-sharing activities can be advantageous in itself, but it also has intrinsic rewards because people can enjoy the moments when knowledge sharing takes place. This enjoyment is closely linked to the researcher's mood, which can be greatly undermined by the existence of high levels of conflict within the group.

A key managerial implication of this study is that public universities should create a proper context where individuals feel motivated to engage in sharing knowledge. For some authors, although universities are recognized as knowledge creation centres, many university institutions are still slow in implementing knowledge management initiatives (e.g., Tan 2016). People in charge of public universities should consider the need to improve the leadership skills of academics who are research group leaders because these leaders can help to create the best possible conditions for knowledge sharing among group members. In addition, it should be noted that, within the academic context, a person who is considered 'an expert' could lead a research group without having the appropriate leadership expertise, skills, and knowledge (Yielder and Codling 2004). Therefore, public university decision-makers should actively improve the leadership skills of these academics. These findings are highly promising because

they affect issues that are not related to the recruitment, compensation, or career planning fields, which are normally beyond the reach of research group leaders in public universities. The findings highlight the need to focus on the aspects of human resources management that could be within the sphere of influence of academic research group leaders, as suggested by Sandhu et al. (2011). Thus, through an adequate training program, public universities could help research group leaders to better manage their human resources and promote higher levels of knowledge sharing, without having to modify incentive and reward systems. In universities and other public organizations, training programs could improve group leaders' interpersonal skills, so that they can be in a better position to prevent unpleasant situations within the group that can hinder knowledge sharing. Moreover, the content of training programs could help leaders to directly impact knowledge sharing because it might help them to find a proper strategy to foster knowledge sharing. Training can help them to identify and assess knowledge-sharing barriers and opportunities and develop an appropriate way to cope with the former and achieve the latter. Training programs could also improve the necessary communication skills to better transmit the importance of knowledge-sharing activities for the benefit of the whole group.

In conclusion, knowledge management can greatly contribute to effectiveness in public organizations. In this regard, this study broadens the literature on knowledge management in public universities through assessing how the leader's role directly influences knowledge sharing. It also extends the literature by showing how leaders of public organizations, such as universities, can indirectly contribute to knowledge sharing, by reducing the negative effects of task and relationship conflicts. In this way, this research provides managers of public universities with interesting notions about leadership roles they have to foster in order to take advantage of knowledge as a strategic resource.

Compliance with Ethical Standards

Conflict of Interest   The authors declare that they have no conflict of interest.

Ethical Approval   Informed consent was obtained from all individual participants included in the study.

References

Ayoko, O. B., & Callan, V. J. (2010). Teams' reactions to conflict and teams' task and social outcomes: The moderating role of transformational and emotional leadership. *European Management Journal, 28*(3), 220–235.

Bai, Y., Lin, L., & Li, P. P. (2016). How to enable employee creativity in a team context: A cross-level mediating process of transformational leadership. *Journal of Business Research, 69*(9), 3240–3250.

Bass, B. J. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3), 19–31.

Berthoin Antal, A., & Richebé, N. (2009). Reflections on experience. A passion for giving, a passion for sharing: Understanding knowledge sharing as gift exchange in academia. *Journal of Management Inquiry, 18*(1), 78–95.

Bono, J. E., Foldes, H. J., Vinson, G., & Muros, J. P. (2007). Workplace emotions: The role of supervision and leadership. *Journal of Applied Psychology, 92*(5), 1357–1367.

Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., & Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *The Leadership Quarterly, 17*(3), 288–307.

Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information and Management, 45*(7), 458–465.

De Dreu, C. K. W., & Weingart, L. R. (2003). Task versus relationship conflict, team performance, and team member satisfaction: A meta-analysis. *Journal of Applied Psychology, 88*(4), 741–749.

Degn, L., Franssen, T., Sørensen, M. P., & de Rijcke, S. (2018). Research groups as communities of practice: A case study of four high-performing research groups. *Higher Education, 76*(2), 231–246.

Forti, E., Franzoni, C., & Sobrero, M. (2013). Bridges or isolates? Investigating the social networks of academic inventors. *Research Policy, 42*(8), 1378–1388.

Fullwood, R., Rowley, J., & Delbridge, R. (2013). Knowledge sharing amongst academics in UK universities. *Journal of Knowledge Management, 17*(1), 123–136.

Grant, R. M. (1996). Toward a knowledge -based theory of the firm. *Strategic Management Journal, 17*(S2), 109–122.

Greene, W. H. (2012). *Econometric analysis.* Upper Saddle River: Prentice Hall.

He, H., Baruch, Y., & Lin, C. P. (2014). Modeling team knowledge sharing and team flexibility: The role of within-team competition. *Human Relations, 67*(8), 947–978.

Hemlin, S. (2006). Creative knowledge environments for research groups in biotechnology. The influence of leadership and organizational support in universities and business companies. *Scientometrics, 67*(1), 121–142.

Jain, A. K., & Jeppesen, H. J. (2013). Knowledge management practices in a public sector organisation: The role of leaders' cognitive styles. *Journal of Knowledge Management, 17*(3), 347–362.

Jehn, K. A. (1997). A qualitative analysis of conflict types and dimensions in organizational groups. *Administrative Science Quarterly, 42*(3), 530–557.

Jehn, K. A., & Mannix, E. A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of Management Journal, 44*(2), 238–251.

Jehn, K. A., Greer, L., Levine, S., & Szulanski, G. (2008). The effects of conflict types, dimensions, and emergent states on group outcomes. *Group Decision and Negotiation, 17*(6), 465–495.

Jiang, X., Flores, H. R., Leelawong, R., & Manz, C. C. (2016). The effect of team empowerment on team performance: A cross-cultural perspective on the mediating roles of knowledge sharing and intra-group conflict. *International Journal of Conflict Management, 27*(1), 62–87.

Jimenez-Jimenez, D., & Sanz-Valle, R. (2013). Studying the effect of HRM practices on the knowledge management process. *Personnel Review, 42*(1), 28–49.

Knies, E., & Leisink, P. (2014). Leadership behavior in public organizations: A study of supervisory support by police and medical center middle managers. *Review of Public Personnel Administration, 34*(2), 108–127.

Kotlyar, I., & Karakowsky, L. (2007). Falling over ourselves to follow the leader: Conceptualizing connections between transformational leader behaviors and dysfunctional team conflict. *Journal of Leadership & Organizational Studies, 14*(1), 38–49.

Lauring, J., & Selmer, J. (2011). Social climate in diverse university departments: The role of internal knowledge sharing. *Educational Research, 53*(3), 347–362.

Lee, P., Gillespie, N., Mann, L., & Wearing, A. (2010). Leadership and trust: Their effect on knowledge sharing and team performance. *Management Learning, 41*(4), 473–491.

Liu, Y., Keller, R. T., & Shih, H. A. (2011). The impact of team-member exchange, differentiation, team commitment, and knowledge sharing on R&D project team performance. *R&D Management, 41*(3), 274–287.

Lu, L., Zhou, F., & Leung, K. (2011). Effects of task and relationship conflicts on individual work behaviors. *International Journal of Conflict Management, 22*(2), 131–150.

Matzler, K., Renzl, B., Mooradian, T., von Krogh, G., & Mueller, J. (2011). Personality traits, affective commitment, documentation of knowledge, and knowledge sharing. *The International Journal of Human Resource Management, 22*(2), 296–310.

Merat, A., & Bo, D. (2013). Strategic analysis of knowledge firms: The links between knowledge management and leadership. *Journal of Knowledge Management, 17*(1), 3–15.

Minbaeva, D. B., Mäkelä, K., & Rabbiosi, L. (2012). Linking HRM and knowledge transfer via individual-level mechanisms. *Human Resource Management, 51*(3), 387–405.

Nistor, N., Daxecker, I., Stanciu, D., & Diekamp, O. (2015). Sense of community in academic communities of practice: Predictors and effects. *Higher Education, 69*(2), 257–273.

Pezzoni, M., Sterzi, V., & Lissoni, F. (2012). Career progress in centralized academic systems: Social capital and institutions in France and Italy. *Research Policy, 41*(4), 704–719.

Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management, 12*(4), 531–544.

Rotolo, D., & Messeni-Petruzzelli, A. (2013). When does centrality matter? Scientific productivity and the moderating role of research specialization and cross-community ties. *Journal of Organizational Behavior, 34*(5), 648–670.

Salas, E., Dickinson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992). Toward an understanding of team performance and training. In R. W. Swezey & E. Salas (Eds.), *Teams: Their training and performance* (pp. 3–29). Norwood: Ablex.

Sandhu, M. S., Jain, K. K., & Ahmad, I. U. K. (2011). Knowledge sharing among public sector employees: Evidence from Malaysia. *International Journal of Public Sector Management, 24*(3), 206–226.

Schulz-Hardt, S., Jochims, M., & Frey, D. (2002). Productive conflict in group decision making: Genuine and contrived dissent as strategies to counteract biased information seeking. *Organizational Behavior and Human Decision Processes, 88*(2), 563–586.

Simons, T. L., & Peterson, R. S. (2000). Task conflict and relationship conflict in top management teams: The pivotal role of intragroup trust. *Journal of Applied Psychology, 85*(1), 102–111.

Singh, S. K. (2008). Role of leadership in knowledge management: A study. *Journal of Knowledge Management, 12*(4), 3–15.

Swart, J., Kinnie, N., van Rossenberg, Y., & Yalabik, Z. Y. (2014). Why should I share my knowledge? A multiple foci of commitment perspective. *Human Resource Management Journal, 24*(3), 269–289.

Tabernero, C., Chambel, M. J., Curral, L., & Arana, J. M. (2009). The role of task-oriented versus relationship-oriented leadership on normative contract and group performance. *Social Behavior and Personality, 37*(10), 1391–1404.

Tan, C. N. L. (2016). Enhancing knowledge sharing and research collaboration among academics: The role of knowledge management. *Higher Education, 71*(4), 525–556.

Tian, J., Nakamori, Y., & Wierzbicki, A. P. (2009). Knowledge management and knowledge creation in academia: A study based on surveys in a Japanese research university. *Journal of Knowledge Management, 13*(2), 76–92.

Tjosvold, D. (2006). Defining conflict and making choices about its management: Lighting the dark side of organizational life. *International Journal of Conflict Management, 17*(2), 87–95.

Travaille, A. M., & Hendriks, P. H. J. (2010). What keeps science spiralling? Unravelling the critical success factors of knowledge creation in university research. *Higher Education, 59*(4), 423–439.

van Woerkom, M., & Sanders, K. (2010). The romance of learning from disagreement. The effect of cohesiveness and disagreement on knowledge sharing behavior and individual performance within teams. *Journal of Business and Psychology, 25*(1), 139–149.

van Woerkom, M., & van Engen, M. L. (2009). Learning from conflicts? The relations between task and relationship conflicts, team learning and team performance. *European Journal of Work and Organizational Psychology, 18*(4), 381–404.

Xue, Y., Bradley, J., & Liang, H. (2011). Team climate, empowering leadership, and knowledge sharing. *Journal of Knowledge Management, 15*(2), 299–312.

Yielder, J., & Codling, A. (2004). Management and leadership in the contemporary university. *Journal of Higher Education Policy and Management, 26*(3), 315–328.

Zboralski, K. (2009). Antecedents of knowledge sharing in communities of practice. *Journal of Knowledge Management, 13*(3), 90–101.

Zhang, X., Cao, Q., & Tjosvold, D. (2011). Linking transformational leadership and team performance: A conflict management approach. *Journal of Management Studies, 48*(7), 1586–1611.

José Luis Ballesteros-Rodríguez associate Professor of Organization at the University of Las Palmas de Gran Canaria (Spain). He holds a PhD in Business Administration in 2008 from the same university. His research interests include tourism management, knowledge management and human resources. He has a specific interest in individual and organisational effects on scientific research performance.

Nieves L. Díaz-Díaz associate Professor of Finance at the University of Las Palmas de Gran Canaria (Spain). She holds a PhD in Business Administration in 2003 from the same university. Her research interests concern knowledge management, innovation, corporate finance and ownership structure. She is the author of several publications, including books, book chapters and papers in journals.

Inmaculada Aguiar-Diaz associate Professor of Finance, Coordinator of the Master in Banking and Finance and Director of the 'la Caixa Chair of Banking and Finance Studies at Las Palmas de Gran Canaria University' (Spain). She received her PhD in Business Administration in 1987. Her research includes two big lines: the first is related to corporate finance and the second is about knowledge management and firm innovation.

Petra de Saá-Pérez professor of Organizational Behaviour and Managerial Skills at the University of Las Palmas de Gran Canaria (Spain). She received her PhD in Management from this university in 1999, and her areas of academic interest include the strategic management of human resources and their influence on organisational capabilities development. She is the author of several publications, including books, book chapters and papers in journals.