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Fostering the determinants of knowledge transfer: a team-level analysis

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Abstract.

The research area of knowledge transfer is a critical one in the current era of the knowledge economy. Previous studies have channelled much effort into understanding how knowledge transfer could be facilitated efficiently. Yet most of these studies conducted research only at the individual level, ignoring the fact that, in many organizations, the team now serves as the basic unit for transferring and preserving knowledge. In addition, these studies have not put much emphasis on the learning side of knowledge transfer. This study attempts to fill the gaps left by previous studies. First, we identify two determinants of knowledge transfer, namely, knowledge sharing and learning intensity. Furthermore, we discuss how to efficiently foster knowledge sharing and learning intensity at the team level from the perspective of social capital. Finally, we conduct an empirical survey to examine relationships among the components of social capital (i.e. trust and social interaction), and knowledge sharing and learning intensity.

Keywords: determinant of knowledge transfer; social capital perspective; trust; social interaction

1. Introduction

Although effective knowledge transfer can help organizations meet goals efficiently and increase performance, the extant literature on the subject has yet to fully address which factors play critical roles in successful knowledge transfer and how these determinants can be fostered. There is a serious need for this type of research; while the benefits of knowledge transfer may be universally recognized, managers need to know how to encourage the determinants of knowledge transfer. Researchers have speculated that social capital could influence knowledge transfer [1]. In this study, we will discuss how to foster the determinants of knowledge transfer from the perspective of social capital.

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According to previous studies, social capital has a critical impact on knowledge combination and exchange [1–3]. In this study, we use the term 'knowledge transfer', which refers to the flow of knowledge, synonymously with the 'knowledge exchange' described in previous studies. Researchers tend to agree that social capital consists of two dimensions, relational and structural [1, 2, 4, 5]. These two dimensions affect knowledge combination and exchange differently. Some components of the relational dimension, such as trust, norms, and obligations, can influence people's motivation to combine and/or exchange knowledge. On the other hand, components of the structural dimension can affect knowledge exchange and combination by shaping the ability of people to access knowledge. This study assumes that means of fostering the determinants of knowledge transfer could therefore be better understood from the viewpoint of social capital. As a result, we use the components of social capital as antecedent variables of the determinants of knowledge transfer.

Regarding components of the relational dimension of social capital, we rely on trust as a manifestation of the relational dimension of social capital because trust is always a critical issue in discussions of issues related to knowledge transfer [1, 5, 6]. On the other hand, this study uses social interaction as the main component of the structural dimension of social capital, echoing arguments from the previous literature [7–11]. The findings of this study, which are related to the social interaction variable, could thus be used to test these previous arguments.

As a result, this study assumes that trust and social interaction are the two main components of social capital, and foster the determinants of knowledge transfer. In the following literature review, we will discuss the determinants of knowledge transfer and the effects of trust and social interaction on these determinants. A two-step interview and survey then follow, the implications of which are presented and carefully discussed.

2. Theoretical development

2.1. The determinants of knowledge transfer

Although knowledge transfer has received a significant amount of attention from researchers in recent years, earlier studies have failed to discuss many relevant issues or conduct empirical tests. Previously, researchers treated the antecedent factor of knowledge transfer by focusing primarily on how information technology usage led to successful knowledge transfer. They believed that if a company was able to better apply information technology, this would result in greater knowledge transfer. But researchers eventually discovered that even organizations with excellent information and communication technology infrastructures did not necessarily realize a great deal of knowledge transfer unless knowledge owners chose to share their own knowledge [12, 13]. Therefore, researchers began to realize that generating successful knowledge transfer did not depend on excellent information technology alone, but also upon the motivation of knowledge owners to share.

Although both information technology and knowledge sharing can partially predict the likelihood of knowledge transfer within a company, these two concepts meet different requirements for successful knowledge transfer. Information technology variables are regarded as a *necessary* condition for successful knowledge transfer, while knowledge sharing is regarded as a *sufficient* condition for successful knowledge transfer. Compared with the abundance of literature on how to use information technology to facilitate knowledge transfer, the sufficient conditions for successful knowledge transfer have to a large extent been ignored (with the exception of knowledge sharing). Thus, this present study is concerned with the factors related to the sufficient rather than necessary conditions for knowledge transfer and also defines the determinants of knowledge transfer as factors belonging to the sufficient conditions for knowledge transfer.

2.2. Knowledge sharing and learning intensity

There have been two flaws in previous studies concerning the determinants of knowledge transfer. First, most research has only been conducted at the individual level and has not addressed the issue

at the team level. This focus may be inadequate, as the team is the basic unit for transferring and preserving knowledge in many organizations [14]. In addition, because the team is currently the most common type of organization design, an understanding of how to promote team effectiveness is very important for practicing managers. While it is worthwhile identifying how to increase the determinants of knowledge transfer for individuals, it might be even more useful to identify how to promote the determinants of knowledge transfer for teams.

Second, regarding the area of knowledge transfer, learning is a critical function of organizations [15]; accordingly, previous studies have paid considerable attention to the issue of learning [16, 17]. However, most previous studies discuss knowledge sharing and learning as two separate issues and rarely recognize them as important determinants of knowledge transfer. Based on Beckman's argument [18], we need to not only solve the dilemma that employees may hoard knowledge instead of sharing it, but also resolve the problem that employees may not learn and use expertise developed by someone else. Davenport and Prusak [10] have pointed out that knowledge transfer is a function of both transmission and absorption. If knowledge is not absorbed by the potential recipient (whether a person or a group) the knowledge has not truly been transferred. Obviously, knowledge recipients must have a strong motivation to learn; otherwise, they will be unable to absorb the given knowledge well. According to Davenport and Prusak, the transmission and absorption stages of knowledge transfer imply the existence of two kinds of actors, knowledge owners and knowledge receivers. This line of thinking can also be found in Hendriks's paper [13]. Both Davenport and Prusak [10] and Hendriks [13] stress that the study of knowledge transfer should concern not only whether knowledge owners have a willingness to share, but also whether knowledge receivers can learn and absorb. Therefore, the issue of learning should be regarded as an important target variable when we discuss the related concept of knowledge transfer. This study proposes a variable called 'learning intensity', which supplements knowledge sharing as a determinant of knowledge transfer.

In this study, both knowledge sharing and learning intensity are operationalized and studied at the team level. Furthermore, a greater degree of knowledge sharing for a team means that most members generally like to share knowledge with their colleagues; a higher degree of learning intensity for a team means that most members have a high learning motivation. Although obstacles can prevent teams from sharing or learning, we assume that trust and social interaction, which are manifestations, respectively, of the relational and structural dimensions of social capital, may affect knowledge sharing and learning intensity. Next, we discuss possible relationships among trust, social interaction, and knowledge sharing and learning intensity.

2.3. Affect-based trust

This study focuses on affect-based trust, which is grounded in reciprocated interpersonal care and concern [19] and which can result in relationships between participants that appear communal [19–21]. In these relationships, people help others not because they expect future obligations or benefits, but simply because their help is needed [22]. A relationship exists between affect-based trust and both knowledge sharing and learning intensity.

First, let us consider why affect-based trust might have a positive influence on knowledge sharing. Davenport and Prusak [10] have noted that, unlike the exchange mechanisms of the traditional economic market, knowledge can be viewed as a type of asset that cannot easily be changed by pricing. In fact, according to the perspective of social exchange, whether or not knowledge sharing occurs might depend primarily on the expected reciprocal benefits between the knowledge owner and receiver [23]. Hall [24] has discussed the link between social exchange and knowledge exchange in detail. Furthermore, trust is arguably the key factor of a successful social exchange [10, 25]. When affect-based trust prevails on a team, members will be both more sensitive to their colleagues' needs and more willing to help them. Hence, social exchange will be more likely to take place, and obstacles to sharing and 'social dilemmas' [26] will gradually disappear. As a result, members of an affect-based trust team will become more likely to engage in the sharing of knowledge without hoarding.

Feelings of affect-based trust not only influence team members' knowledge sharing, but also enhance their learning intensity. A perception of trust among employees paves the way for a good

learning environment and especially for collective learning [27]. Once a team is infused with affect-based trust, communal relationships presumably will be deeply embedded in its members' minds. Thus, because they believe in their partners' altruistic motives and affective concerns, members will tend to believe that knowledge given by other members is useful to them. Consequently, members might become more open to learning their colleagues' given knowledge. As a result, we assume that a team's degree of affect-based trust has a positive effect both on knowledge sharing and learning intensity.

Hypothesis 1: The affect-based trust in a team is positively related to the team's degree of knowledge sharing.

Hypothesis 2: The affect-based trust in a team is positively related to the team's degree of learning intensity.

2.4. Social interaction

In this study, the concept 'social interaction' refers to activities designed and implemented by team leaders and companies to promote knowledge transfer. When a team has a high level of social interaction, members have numerous opportunities to interact. Frequent interaction helps members develop interpersonal relationships; intimate interactions may further strengthen members' mutual understanding and facilitate good relationships among them [28]. Usually, when a common sense of identity and friendship inspires people to work as a familiar and friendly team, the team members will help each other and then form an in-group relationship. Therefore, a team with a high level of social interaction will be capable of leading team members to form an in-group relationship.

In previous studies, researchers confirmed the phenomenon of 'in-group favoritism,' according to which people give members of groups to which they belong better evaluations and more resources and try to maximize the gaps in relative interests between the in-groups and out-groups [29–32]. Because social interactions could help members form an in-group relationship, we assume that members of a team with a high level of social interaction will be likely to share their own skills, professional knowledge, and values with other team members. This leads to the following hypothesis:

Hypothesis 3: The social interaction of a team is positively related to the degree of knowledge sharing within the team.

The relationship between social interaction and learning intensity might also be explained from the viewpoint of 'social navigation', the process of seeking social interaction as a source of navigational support [33–35]. Teams that engage in frequent social interaction activities enable their members to search for knowledge and information via social navigation. These team members can easily gain the information they want and need, and therefore become even more willing to learn. Thus, an organization can promote employees' learning intensity by providing a friendly environment that allows employees to obtain the knowledge they need and want.

Some previous studies also support this hypothetical relationship between social interaction and learning intensity. For example, Stewart [36] has argued that learning is a social activity and that organizations therefore should provide various kinds of interaction activities for their members. Dixon [15] claimed that face-to-face interaction is desirable because it allows team members to identify new knowledge on the spot. Davenport and Prusak [10] suggested that organizations could provide water coolers and talk rooms for employees to interact in and seek help in solving problems. Theoretically, companies should encourage employees to seek help from each other freely not only during work hours [7–11] through face-to-face meetings, talk rooms, and mentoring programs, but also through after-work activities that allow employees even more opportunities to consult with each other [10, 37].

In sum, we argue that because social interaction provides a venue for members to learn from each other, the more social interaction within a team (such as in face-to-face meetings, after-work activities, talk rooms, and mentoring programs), the higher the amount of learning opportunities offered and, in turn, the greater the increase in members' learning intensity.

Hypothesis 4: The social interaction of a team is positively related to the degree of learning intensity of the team.

Overall, the research framework of this study is presented in Fig. 1.

Compared to affect-based trust, social interaction is more concrete and easier to put into practice. However, previous studies have focused on it less often and have given it less importance than affect-based trust. For this reason, we will explore the content of social interaction before testing our research framework. We conducted two studies in Taiwan. In Study 1, we explored the practices of social interaction through two-step interviews. Study 2 was a field investigation of the relationships among affect-based trust, social interaction, and knowledge sharing and learning intensity.

3. Study 1. Exploring the practices of social interaction

3.1. Two stages of interviews

Sales teams from the e-travel industry were the target of the empirical sample for both Study 1 and Study 2. In the travel industry and especially among sales teams, intense competition, multifunctional workers, and a high rate of turnover increase the importance of knowledge management. Study 1 was designed to explore the practice of social interaction. To meet this goal, we conducted a two-step interview.

3.1.1. The first stage As our sample for the first stage of the interview, we interviewed two experienced sales managers from Company Zion Tours and Company New Roc Travel respectively (see Table A1 in the Appendix). Based on activities mentioned in the literature referred to in Section 2.4 (e.g. face-to-face meetings, after-work activities, talk rooms, and mentoring programs) and on data from interviews, we developed an initial list of social interaction practices. The purpose of this stage's interview was to give us a basic understanding of the practices of social interaction in the e-travel industry.

3.1.2. The second stage In the second stage of the interview, we conducted three in-depth interviews with sales managers from three types of e-travel agencies (see Table A1 in the Appendix). These three companies all have different modes of operation and occupy leading positions in different areas of the travel industry. In this stage, we coded certain paragraphs from the interviews to obtain a total of 149 statements describing social interaction activities. We analyzed these statements using the technique of content analysis [38], with the initial list developed from the first stage of interviews as a basic analysis framework. Three assistants, MBA (Master of Business Administration) graduate students, independently decided whether these statements could be classified into the initial practices of social interaction. We also discussed with these assistants whether

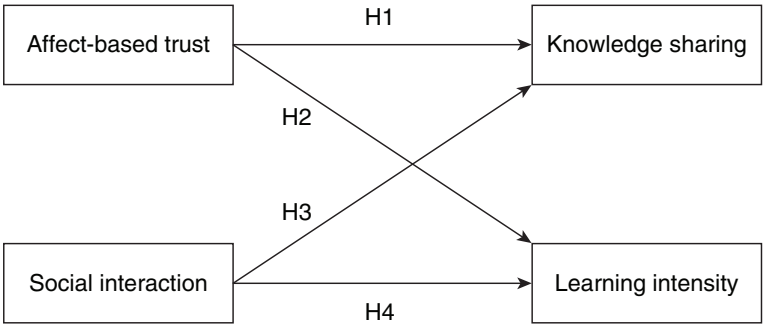

Fig. 1. Research framework.

other practices of social interaction existed that had not yet been included in the initial schema. After revising the initial schema of social interaction practices, we could then classify all of the statements from the in-depth interviews into one of these social interaction practices. Eventually, six practices of social interaction were developed and established.

3.2. Practices of social interaction

The six practices included were social gatherings during working hours, after-work parties, apprenticeships and coaching, information communities, symposiums, and routine meetings revolving around sales and products.

(a) Facilitate social gatherings during working hours. Allowing and promoting social activities during working hours enables employees to talk freely and comfortably about job issues and problems. At such times, they can exchange opinions, share experience, and gain knowledge. Through conversations with experienced colleagues, employees can efficiently find ways of solving work problems and enhance their performance. To achieve this, companies need to facilitate private chats, encourage an open corporate culture, endorse social gatherings, and design office layouts accordingly, being sure to provide water coolers and discussion rooms.

(b) Spend after-work hours together. Employees largely can decide for themselves whether or not to attend the social interaction activities in this category, which are held after work hours. The main purposes of such activities usually are not directly related to employees' daily jobs. Gatherings of this kind include birthday parties, team vacations, and other activities that promote friendship among colleagues. The function of this social interaction practice is somewhat similar to that of the previous one; it grants members the opportunity to connect with and contact each other, thereby increasing knowledge transfer.

(c) Apprenticeship and coaching. This kind of social interaction practice focuses on increasing social interaction between senior and junior employees. The main purpose of apprenticeship and coaching is to allow experienced members to acquaint junior members with work-required skills. Basically, apprenticeships and coaching allow knowledge to be passed from experienced employees to others. The social interaction activities of apprenticeship and coaching include assigning every new employee a senior employee to help him or her during orientation and establishing mentoring programs that enable employees to receive a mentor's help at any time.

(d) Information communities. Organizations occasionally hold information-sharing meetings and activities in order to encourage and help members form information communities. Information gathering and learning are the main goals of this social interaction practice; activities in this realm include inviting high-performing employees to share their knowledge with colleagues or inviting employees who have just acquired new knowledge from outside sources to share it with others in information communities.

(e) Symposiums. These are annual meetings focused on specific themes. Symposium participants are divided into teams, which proceed with in-depth discussion of particular issues. Usually, companies treat such symposiums seriously, as they offer a time for members to engage in in-depth discussion and exchange knowledge with a specific agenda. Basically, the deep, specialized level of thematic discussion in symposiums distinguishes this social interaction practice from others.

(f) Routine product and sales meetings. These are regular, frequent corporate activities in which employees from different levels discuss business reports and operational problems. During these routine meetings, members can share successful experiences with each other and find new ways to resolve workplace dilemmas. Because such activities occur frequently and regularly, they can greatly assist members in dealing with the everyday challenges of running a business. In essence, routine product and sales meetings offer members a very good platform to share and learn 'just in time'.

4. Study 2. Empirical tests

4.1. Data collection and research site

Because this study aims to discover how different attributes of a team (i.e. affect-based trust and social interaction) affect the team's degree of either knowledge sharing or learning intensity, we collected the sample at the team level. Each team questionnaire included one team-leader questionnaire concerning social interaction and five team-member questionnaires concerning affect-based trust, knowledge sharing, learning intensity, and task uncertainty (the control variable). In order to be considered valid for the team-level analysis, team questionnaires had to contain one completed team-leader questionnaire and at least three completed team-member questionnaires.

Due to the complex nature of the survey procedures, we collected the sample using the judgment sampling method. Following Wu [39], we used the largest search engine in Taiwan, Yahoo-Kimo (tw.Yahoo.com); in an attempt to focus on travel intermediaries and agents, we searched under the terms 'travel agent' and 'travel service'. Next, we conducted a search of all travel agents in the resulting list to find appropriate companies to participate in the study. We chose samples from websites that not only presented information, but also offered commercial services. We prepared a suitable list of travel agents, then asked these travel agents about their willingness to take part. We sent team questionnaires by post or email to the obliging travel agents, their sales team leaders (managers of sales departments or sales units), and sales department employees. A total of 94 team questionnaires coded to ensure confidentiality, including 94 for team leaders and 470 for team members, were distributed. Some of those questionnaires were returned through designated coordinators; the others were mailed directly to the authors. Finally, we obtained 52 usable questionnaires from 52 team leaders and 181 members, a response rate of 55.3%.

In this sample, most sales teams were concerned with sales and promotion (84%), followed by the improvement of service quality (8%); 34 of the teams (65.4%) had been in operation for over three years. There were 181 team member participants in this study, of whom 145 (80.1%) were female. Of the participants, 20.4% had been members of their present team for less than six months, 26% between six months and one year, 22.7% between one and three years, and 30.9% for more than three years.

4.2. Measurement

We measured all multi-item scales on a five-point scale. All materials were presented in Chinese, although they were sometimes translated from English where needed. We obtained the empirical data from two types of samples, one consisting of team leaders and the other of team members. Since our analysis focused on the team level, our empirical data thus needed to consist of team-level data when we conducted our statistical analysis. Of our two types of data, the data obtained from team leaders could naturally be treated as team-level data. However, for these constructs, which were assessed by the team leaders, we needed to transform the individual-level data into team-level data before performing the statistical analysis. Following previous studies [40, 41], we adopted the mean method to aggregate the individual-level data into the team-level data. For example, if we wanted to know team A's score for affect-based trust, we would first calculate each member's score, then aggregate all of team A members' scores into a new score by calculating the mean score. This new mean score would then present team A's score for the construct of affect-based trust at the team level.

4.2.1. Dependent variables

(a) Knowledge sharing. To measure the knowledge sharing construct (see Table A2 in the Appendix), we adapted 10 items from Cheng and Li [42]. Sample items included: 'Usually, I do my best and offer suggestions while discussing work-related matters with my colleagues'; 'I am usually willing to share my knowledge and experience with others'; and 'When my colleagues consult me, I am willing to answer their questions as well as I can.' Knowledge sharing was assessed by team members, who rated their own intention of engaging in knowledge sharing with colleagues on a five-point Likert scale, ranging from 1 ('strongly disagree') to 5 ('strongly agree'). Cronbach's

alpha for this measure was 0.93. In order to conduct a team-level analysis, we aggregated individual members' scores into a team-level score using the mean method.

(b) Learning intensity. This construct examines a team's motivation to learn. According to the need satisfaction model, motivation will emerge once certain needs are satisfied [43]. Likewise, we assumed that members with higher degrees of satisfaction concerning the need to learn would have a higher motivation to learn. We modified six items from Weiss et al. [44] and measured each item on a five-point Likert scale, ranging from 1 ('strongly dissatisfied') to 5 ('strongly satisfied') (see Table A2 in the Appendix). Sample items included: 'Learning from others can provide me with steady employment'; 'Learning from others can allow me to do things for other people'; and 'Learning from others gives me the chance to make the most of my ability.' Cronbach's alpha for this measure was 0.87. Individual members' scores were aggregated into a team-level score using the mean method.

4.2.2. Independent variable

(a) Affect-based trust. We measured affect-based trust by adapting five items from McAllister [19]: 'My colleagues and I can freely share our ideas, feelings, and hopes'; 'I can talk freely to my colleagues about difficulties I am having at work and know that they will want to listen'; 'I would feel a sense of loss if any one of the members within our team was transferred and we could no longer work together'; 'If I shared my problems with my colleagues, I know they would respond constructively and caringly'; and 'I would have to say that my colleagues and I made considerable emotional investments in our working relationship.' Team members were asked to rate their degree of agreement with their colleagues' statements on a five-point Likert scale, ranging from 1 ('strongly disagree') to 5 ('strongly agree'). Cronbach's alpha for this measure was 0.80. In order to conduct a team-level analysis, we aggregated members' scores to the team level.

(b) Social interaction. Social interaction refers to activities that team leaders and companies design and implement to promote knowledge sharing and learning intensity. Based on the establishment of social interaction practices in Study 1, we developed and used nine social interaction activities as items on a social interaction scale (as shown in the right-hand column of Table A3 in the Appendix). Sample items included: 'The company allows employees to consult their colleagues on problems during work time'; 'There are tearooms and rest rooms for employees to talk to each other in and share experiences'; and 'The company holds birthday parties, trips, and other activities that promote friendship among colleagues.' This multi-item scale was measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). In this study, team leaders provided information concerning these items. Cronbach's alpha for this scale was 0.82.

4.2.3. Control variables The control variable in this study was task uncertainty. Specifically, we assumed that when a team's task is uncertain, levels of either knowledge sharing or learning intensity may be high. When a team has a high degree of task uncertainty, its members must deal with nonroutine and unexpected tasks very often [45, 46]; thus, it is not easy for these team members to accomplish their daily jobs. According to the social exchange perspective, when team members regularly have to cope with difficult tasks, they should be more willing to share their knowledge in order to receive reciprocal help from others in the future [23]. This willingness to share will gradually turn the team into a high-level knowledge sharing team. Therefore, we believe that task uncertainty influences knowledge sharing. In addition, we believe that task uncertainty affects learning intensity. Quinn et al. [9] have pointed out that increasing the work challenges of professionals is an effective means of upgrading their ability. Hence, we infer that a high degree of task uncertainty for a team can effectively stimulate members' motivation to learn, thereby allowing the team to reach a higher level of learning intensity. We developed four items and asked team members to rate their degree of task uncertainty on a five-point Likert scale, ranging from 1 ('strongly disagree') to 5 ('strongly agree'). Items on this scale included: 'On my team, the work changes daily'; 'My team usually faces new problems'; 'I usually have to use different methods and procedures to complete my job'; and 'My team members usually need to seek different methods to solve their problems.' Cronbach's alpha for this measure was 0.68. Members' scores were then further aggregated into team-level scores.

4.3. Results

Table 1 contains the mean values, standard deviations, and correlations for all of the measured variables in this study. We tested the hypotheses with two multiple regression analyses.

Table 2 shows the results of the effect of affect-based trust and social interaction on knowledge sharing and learning intensity. Before testing the hypotheses using regression analysis, we tested the values of the variance inflation factor (VIF) for each independent variable in the two multiple regressions for the possible problem of multicollinearity. Myers [47] states that if the value of VIF exceeds 10, multicollinearity might exist within the regression and will distort the results. The VIF test performed in this study showed that all of the values for each independent variable were lower than 1.37. Therefore, it is unlikely that multicollinearity exists in the multiple regressions of this study.

Hypotheses 1 and 2 predict that team affect-based trust has a direct effect on both knowledge sharing and learning intensity. As shown in Table 2, the coefficient of affect-based trust is positive and has a significant effect on knowledge sharing (beta = 0.52, $p < 0.001$) and on learning intensity (beta = 0.24, $p < 0.05$), indicating that a team with high affect-based trust is likely to engage in strong knowledge-sharing and learning-intensity efforts. Hence, Hypotheses 1 and 2 are supported. Hypothesis 3 states that a team that frequently interacts socially is likely to engage in a greater degree of knowledge sharing than less socially interactive teams; Hypothesis 4 argues that such social interaction will strengthen learning intensity. However, as social interaction was found to have no effect on knowledge sharing, Hypothesis 3 was not supported. The coefficient of social interaction was positive and significant (beta = 0.30, $p < 0.05$) on learning intensity, indicating that a team with more social interaction is likely to have stronger learning motivation than a team with less social interaction, therefore confirming Hypothesis 4. Based on the result for Hypothesis 4, we further explored the relationship between each social interaction activity (see the right-hand column of Appendix Table A3) and learning intensity using correlation analysis. The results of the correlation analysis show that two social interaction activities are positively associated with team learning intensity: 'The company invites high-performance employees to share their knowledge with others in meetings' ($r = 0.37$, $p < 0.01$) and 'The company has mentoring programs in which employees can receive their mentor's help at any time' ($r = 0.32$, $p < 0.05$).

Table 1
Scale correlations among variables

Variable	Mean	S.D.	1	2	3	4	5
1. Task uncertainty	3.37	0.37					
2. Affect-based trust	3.71	0.36	0.11				
3. Social interaction	3.95	0.53	0.13	0.05			
4. Knowledge sharing	4.02	0.29	0.03	0.51***	–0.02		
5. Learning intensity	3.70	0.31	0.49***	0.30*	0.37**	0.39**	

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$, two-tailed tests.

Table 2
Regression analysis: knowledge sharing and learning intensity as the dependent variables

	Knowledge sharing	Learning intensity
Independent variable		
Task uncertainty	–0.02	0.42**
Affect-based trust	0.52***	0.24*
Social interaction	–0.04	0.30*
Adj-R^2	0.22	0.35
F	5.72**	10.07***

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

5. Discussion and conclusion

Although the importance of knowledge transfer has been recognized for years, the determinants of knowledge transfer still remain unclear. This study has identified two important determinants of knowledge transfer, knowledge sharing and learning intensity, and has suggested methods to foster these determinants.

From the viewpoint of social capital, we have explored the attributes of affect-based trust and social interaction within a team that affect the team's degree of knowledge sharing and learning intensity. Overall, the results support the argument that social capital facilitates the determinants of knowledge transfer; this finding is robust at the team level. First, the empirical results demonstrate that the higher the level of affect-based trust within a team, the more knowledge sharing and learning intensity are induced. This finding again proves the importance of trust in promoting knowledge transfer. In particular, the relationship between affect-based trust and learning intensity has been confirmed. It is based on one important characteristic of trust, namely, 'opening up' [48]. A team suffused with affect-based trust can encourage its members to open up to each other more when given the opportunity to learn. In other words, building affect-based trust among team members could potentially overcome the problem of learning inertia. In addition, researchers long have recognized the importance of trust in relation to knowledge sharing, but the influence of trust on learning has been ambiguous. Here, we provide evidence of the relationship between trust and learning. In general, our results are consistent with previous research showing that affect-based trust can prompt individuals to help their colleagues [19], and prove the importance of establishing trust at the beginning of a successful knowledge transfer process [10, 49].

We also explored the relationships between social interaction and knowledge sharing and learning intensity. The empirical results demonstrate that social interaction is positively related to learning intensity. This result is consistent with the view of many researchers that social interaction can promote individual learning [7–11]. This study assumed that frequent social interaction encourages team members to share; however, social interaction had no effect on knowledge sharing. Perhaps frequent interaction among members does not guarantee the formation of the type of in-group relationships that would enhance the motivation to share knowledge.

We identified two social-interaction activities that are positively related to learning intensity. This interesting finding implies two messages. First, by providing opportunities for team members to learn from 'experts,' an organization may be able to promote members' learning intensity more effectively (e.g. a company could invite high-performing employees to share their knowledge with others in meetings). Sometimes professional employees refuse to learn from each other because they consider themselves to be the highest achievers in their domain [9, 50]. In addition, once employees become accustomed to doing things a certain way, they are typically reluctant to change their habits [10]. Thus, the best way to promote members' learning intensity may be to let them know that they are learning from an 'expert.' Second, while employees may be enthusiastic about gaining knowledge that helps them solve everyday work problems, if they are not provided with adequate opportunities to gain such knowledge, they could become discouraged and eventually give up on learning. Therefore, organizations could potentially benefit from providing employees with chances to learn (e.g. through mentoring programs). In sum, these two types of social-interaction activities promote learning intensity in two ways. The first type provides team members with the opportunity to learn from experts, thereby overcoming the common reluctance of professional employees to acquire new knowledge. The second type creates learning opportunities for those who have become discouraged about learning. For reasons we do not understand, seven other social-interaction activities do not significantly correspond with learning intensity; future studies could attempt to explain this phenomenon.

Our findings echo developments in information behavior. Hyldegård [51] has noted that an individual's information behavior is heavily affected by his or her social setting. Although it is not yet known how contextual and social factors affect individual behavior in relation to information behavior, this study could make a slight contribution to the study of knowledge transfer in information science, an emerging and promising agenda that has raised issues regarding the social and contextual dimensions of information behavior. In the current study, affect-based trust is likely to be a team 'cli-

mate' among members, and social interaction is likely to be an interaction structure given and designed by the organization. The organization behavior literature has claimed [52] that a team's climate and structure offers a type of contextual factor for team members that could influence members' behavior. Therefore, our results concerning the influence of affect-based trust and social interaction on knowledge sharing and learning intensity (information behaviors) could potentially help us to better understand how contextual and social factors affect individuals' information behavior. Nevertheless, although we argued that affect-based trust and social interaction could be regarded as types of contextual and social factors, they represent just a small part of the range of contextual and social factors.

This research has two practical implications for managers. First, it suggests that affect-based trust could promote both team knowledge sharing and learning intensity. Thus, leaders who are eager to create a team that is full of motivation to share and learn can begin by building an affect-based trust environment within the team. Second, although social interaction was not found to be significantly related to knowledge sharing, it was significant in terms of increasing learning intensity. Compared with affect-based trust, the concept of social interaction is more concrete, more controllable, and easier to implement. In particular, we have identified two types of social-interaction activities that are significantly and positively related to learning intensity and thus offer team leaders a simple and practical way to increase learning intensity within a team.

6. Limitations

The limitations of this research must be mentioned. First, this study discussed members' motivation in relation to knowledge sharing and learning intensity, but not their capability. Future studies could explore whether knowledge givers have the ability to share and whether knowledge receivers have the capacity to learn. Second, our empirical data was collected using cross-sectional data; therefore, a bias may exist in the testing of our hypotheses. Future studies might explore this topic using longitudinal data. Third, because we drew our entire sample from sales teams, it would be impractical to apply our results to teams with different characteristics from sales teams. Fourth, we used only the variables of trust and social interaction to describe a team's attributes when, from the perspective of social capital, many other variables exist, such as team norms, identification, and shared codes and language. These could be used by future studies as possible variables in the search to discover how to develop knowledge sharing and learning intensity at the team level. Finally, in this study we implicitly assume that social capital is a good thing. However, previous studies have recognized that social capital exhibits some drawbacks [53], such as the exclusion of outsiders, limits on individual freedom, and excessive demands made on group members. Therefore, some social-capital factors might have certain characteristics that negatively impact the facilitators of knowledge transfer; future studies could devote more attention to this issue.

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Appendix

Table A1
Sample companies interviewed

Stage of the interview	Descriptions
First stage	
Company Zion Tours (www.zion.com.tw) Company New Roc Travel (www.roctravel.com.tw)	Company Zion was founded in 1967, and Company New Roc Travel was founded in 1990. These two companies offer package tour services for their customers in relation to both inbound and outbound travel. Along with the emerging development of e-commerce, both companies have applied information technology to their daily business operations since the 1990s.
Second stage	
Company Ezfly.com (www.ezfly.com)	Founded in 1999, Company Ezfly.com is a pure e-commerce company, operating in the virtual world without any real stores of its own. Thanks to growing information technologies, this company provides a comprehensive range of travel services and enjoys a leading position in the online travel industry.
Company Ez Travel (www.eztravel.com.tw)	Company Ez Travel was founded in 2000. In its early years, the company did business only on the internet. Later, it had its own offices, which provided limited but complementary services that were not available online.
Company Phoenix (www.phoenix.com.tw)	Company Phoenix is one of the traditional travel service providers in Taiwan. Founded in 1957, this company has accumulated a great deal of experience in both inbound and outbound travel. Since applying information technology to its daily business operations in 1991, this company has satisfied customers' needs in both the digital and the real world and has enjoyed a leading position in its field.

Table A2
Survey question statements on determinants of knowledge transfer

Question section	Description
1. Knowledge sharing	Usually, I do my best and offer suggestions while discussing work-related matters with my colleagues.
	I am usually willing to share my knowledge and experience with others.
	When my colleagues consult me, I am willing to answer their questions as well as I can.
	I usually record as much as possible when I am writing a document or a report.
	If something is hard to explain, I gladly give my colleagues a demonstration.
	I am willing to offer less-experienced colleagues opportunities to perform.
	When my colleagues are in need, I do my best to offer them needed information and documents.
	When I can't help my colleagues solve their problems, I tell them where to look for assistance.
	I encourage my colleagues when they are facing difficulties at work.
	When I teach my colleagues, I express my ideas in a way in which they can be fully understood.
2. Learning intensity	Learning from others can provide me with steady employment.
	Learning from others can allow me to do things for other people.
	Learning from others gives me the chance to make the most of my ability.
	Learning from others increases my pay.
	Learning from others improves my chances for advancement within the company.
	Learning from others allows me the opportunity to receive praise.

Table A3
Measurement items of social interaction

Practices of social interaction	Social interaction activities
Facilitate social gatherings during working hours	1. The company allows employees to consult their colleagues on problems during work time.
	2. There are tearooms and rest rooms available where employees can talk to each other and share experience.
Spend after-work hours together	3. The company holds birthday parties, trips, and other activities that promote friendship among colleagues.
Apprenticeship and coaching	4. The company assigns every new employee a senior employee to help him/her during orientation.
	5. The company has mentoring programs in which employees can receive their mentor's help at any time.
Information communities	6. The company invites high-performance employees to share their knowledge with others in meetings.
	7. The company invites employees who have just acquired new knowledge from outside sources to share what they have learned with others.
Symposiums	8. There are annual conferences concerning certain products that require in-depth discussion among colleagues.
Routine product and sales meetings	9. The company holds regular meetings where colleagues can share successful experiences or resolve work problems.