Expert Systems with Applications 36 (2009) 6156–6163

Contents lists available at ScienceDirect

Expert Systems with Applications

journal homepage: www.elsevier.com/locate/eswa

Understanding social loafing in knowledge contribution from the perspectives of justice and trust

Tung-Ching Lin, Chien-Chih Huang *

Department of Information Management, National Sun Yat-sen University, 70 Lien-Hai Road, Kaohsiung 804, Taiwan, ROC

ARTICLE INFO

Keywords:
Justice
Knowledge contribution
Social Exchange Theory
Social loafing
Trust

ABSTRACT

Many studies have confirmed that social loafing can greatly undermine a group's performance. The negative impact of social loafing is even more pronounced in knowledge contribution, since much valuable knowledge is implicit and thus easy to conceal. However, few studies have centered on investigating the effect of social loafing on knowledge contribution, namely, knowledge contribution loafing (KCL). The aim of this study is to develop an integrative understanding of major KCL antecedents in team projects. We employ as our theoretical framework the widely applied Social Exchange Theory (SET) and focus on two of its core concepts, trust and justice, each of which is in turn sub-divided into three types to facilitate a more comprehensive understanding. Through a cross-industry survey of 157 groups in Taiwan and after a partial least squares (PLS) analysis, the result of this study shows that KCL can be effectively diminished by raising interactional justice and benevolence-based trust. Additionally, we find that procedural, interactional and distributive justice as well as integrity-based trust also exert a positive effect on boosting benevolence-based trust.

1. Introduction

Social loafing refers to the behavior in which an individual tends to exert less effort when working with others than when working alone (Chidambaram & Tung, 2005). Since social awareness would be automatically reduced in a group setting (Williams, Harkins, & Latané, 1981), a team or group setting would naturally be a hatch ground for social loafing. When individuals are doing their share in a group, some may be suspicious of and distrust their fellow group members and worry that others might not make their respective contributions. Moreover, when an individual's contributions to a group work are being unfairly judged, the effort he makes usually will be accordingly adjusted to reflect his perceptions of fairness and thus more liable to loafing behavior (George, 1992).

Research on group behavior has since identified social loafing as a particularly serious problem plaguing groups' performance in terms of quality of decision, quantity and quality of ideas (Chidambaram & Tung, 2005). In many cases solutions later proved to be far from the best are selected only because the decision-making process is based on insufficient knowledge provided by group members. When effort in knowledge contribution is withheld, individual and organizational performance may be discounted (Bennett & Naumann, 2004). On the other hand, effectively managing project knowledge to make proactive and timely decisions can have a positive impact on various aspects of project performance in terms of quality, time and cost (Brookes, Morton, Dainty, & Burns, 2006).

Dictated by the human nature to get more with less sweat, individuals in a group are inclined to participate passively in information-exchange activities, hoarding other participants' knowledge contributions, rather than actively engaging in making their own contributions (Kerr, 1983). Besides, compared with other kinds of efforts such as product selling or specifically assigned tasks (George, 1992; Liden, Wayne, Jaworski, & Bennett, 2004), most valuable knowledge is implicit and thus hard to identify and measure in exactitude one's real knowledge contribution, individuals in a group usually don't have scruples about loafing in knowledge contribution. Hence, it is justifiable to assert that knowledge contribution loafing poses a great threat to team project success.

To avoid this process threat of reduced effort in knowledge contribution, which in turn may impede group and organizational productivity, it is the top priority to pinpoint the factors that may contribute to it (Comer, 1995). Seldom have prior studies been conducted to investigate this undesirable loafing effect on knowledge contribution, though. Therefore, to provide a solid and theoretical understanding on it, a KCL (knowledge contribution loafing) construct, designating as the likelihood that an individual will give less than full effort on knowledge contribution in a group setting, is created in this study. And the key determinants of KCL are identified and analyzed based on the widely accepted Social Exchange Theory extended with Trust and Justice Theories.

* Corresponding author. Tel.: +886 7 5254713; fax: +886 7 5254799.
E-mail address: tw_cchuang@hotmail.com (C.-C. Huang).

0957-4174/$ - see front matter © 2008 Elsevier Ltd. All rights reserved.
doi:10.1016/j.eswa.2008.07.014

2. Theoretical background and hypothesis

2.1. Social Exchange Theory in social loafing

Many authors have studied different aspects of social loafing from a variety of theoretical perspectives, and among them are Expectancy Theory (Karau & Williams, 1995), Social Impact Theory (Chidambaram & Tung, 2005) and Social Exchange Theory (Murphy, Wayne, Liden, & Erdogan, 2003). Expectancy Theory proposes that employees will work harder if they perceive that hard work will be rewarded, thus decreasing the social loafing effect (Bennett & Naumann, 2004). Social Impact Theory considers the extent to which individuals can be viewed as either sources or targets of social influence (Karau & Williams, 1995) – the greater the number of sources and targets is, the lower an individual's input to group tasks would be (Chidambaram & Tung, 2005).

Another widely used theory in discussing social loafing is Social Exchange Theory (SET) which explores personal interactions involving behavior, affection, products, and communications from social psychological perspective (Blau, 1964; Homans, 1961). SET explains human behavior primarily in terms of social exchange (Blau, 1964); it assumes that some kind of future return, may it be clearly or vaguely defined, is naturally expected whenever one is doing favor or putting effort to make contribution. SET also assumes the existence of relatively long-term relationships of interest (i.e., personal obligation, gratitude and trust) as opposed to one-off exchanges (Bock & Kim, 2002; Kankanhalli, Tan, & Wei, 2005). When individuals are in a high-quality relationship, they will behave in ways that will benefit their exchange partners, such as performing at higher levels and exerting extra effort, even if they are not immediately rewarded for such altruistic behaviors (Murphy et al., 2003). By emphasizing how social ties can alter an individual's willingness to behave in other party's interest, social exchange forms a countervailing force to offset the incentive to engage in social loafing (George, 1992; Nooteboom, 1996).

With the focus on dyadic exchange relations consisting primarily of voluntary transactions involving transfer of resources between two or more individuals (Kern & Willcocks, 2002), Social Exchange Theory has recently been employed to facilitate research in knowledge sharing. King and Marks (2008) from the viewpoint of reciprocal arrangements indicated that organizational support is positively related to employees' effort to contribute efficacious knowledge. From the perspectives of social rewards, Wasko and Faraj (2005) found that people contribute their knowledge when they perceive that it enhances their professional reputations. Also, Bock, Kankanhalli, and Sharma (2006) and Kankanhalli et al. (2005) proposed that SET can be used to identify the costs (or negative outcomes, such as loss of power) and benefits (or positive outcomes, such as image) perceived by individuals during knowledge-seeking or contribution.

Therefore, with an aim to investigate the effect of social loafing on knowledge contribution (KCL), this study finds it justifiable to base the research model on Social Exchange Theory. Two of the core concepts in SET, trust and justice (Blau, 1964), are specifically addressed to give a more focused and comprehensive understanding of KCL. SET postulates that individuals would expect some reciprocal and fair return in the future from the organization or the other party whenever there is an input of effort from them. This is a different case than economic exchange. The latter always ensures a precise return with a clearly specified contract, while the social benefit involved in the former, i.e., social exchange, is usually indefinite, unidentifiable, and with no concrete contract to ensure its realization. Accordingly, the input of one's effort and commitment is highly contingent on trust, the trust to the other party. In addition to trust, justice is a major concern during the input of effort. When an individual assesses the future social benefit returned is not in proportion to the effort put in (i.e., his personal cost), the willingness of devoting his time and effort will be reduced in accordance. The concepts of trust and justice have since been widely reconstructed to facilitate the studies in collaborative working. Trust, for instance, has long been considered as the major factor influencing a group's shared knowledge (Hsu, Ju, Yen, & Chang, 2007; Karau & Williams, 1995). Through mutual trust, individuals are more willing to communicate and to share experience with other team members (Hsu et al., 2007). Some researchers in their investigation have confirmed the relevance of the concept of justice to loafing behavior, and asserted its affecting power to influence an individual's commitment to an organization (Bettencourt, Brown, & MacKenzie, 2005). If one's belief in group justice is violated, he not only will dilute his commitment but also have the propensity to withhold effort (Kidwell & Bennett, 1993). As such, the SET-based KCL model is formulated and summarized in Fig. 1, and some hypotheses will be derived and explained in the following sections.

2.2. Linking trust to knowledge social loafing

In the context of knowledge sharing, trust has further been considered as multidimensional constructs (Hsu et al., 2007; Panteli & Sockalingam, 2005). This study, following Simons' suggestions (2002), adopts one of the most commonly cited taxonomy methods to include three types of trust (Mayer, Davis, & Schoorman, 1995) which have been mapped to other KS studies ever since (Hsu et al., 2007; Panteli & Sockalingam, 2005) – competence-base trust (CBT), integrity-based trust (IBT) and benevolence-based trust (BBT). Among these three types of trust, numerous researchers have advocated that a person's BBT and CBT beliefs can enable effective knowledge creation and sharing in social networks (Abrams, Cross, Lesser, & Levin, 2003; Levin & Cross, 2004). Furthermore, Stewart and Gosain (2006) argued that affective (BBT) and cognitive (CBT) components of trust are important to the members' input effort. However, the direct relationship between IBT and knowledge sharing has seldom been empirically validated in the literature though Levin and Cross (2004) argued that IBT is likely to be less critical in the knowledge-seeking context.

CBT is defined as the degree to which a member believes that other team members are knowledgeable and competent (Mayer et al., 1995). If a contributor has high CBT in other team members, he will expect his inputs to be useful and the project to sustain ongoing success, thereby making it more worthwhile to devote his efforts to the project (Stewart & Gosain, 2006). BBT, by definition, refers to the degree to which a member believes other team members will act in his best interest (Mayer et al., 1995). BBT stems from emotional attachment between a trustor and a trustee and may, therefore, be most relevant to a member's psychological and emotional motivation to join in, stay with, and contribute knowledge to the project teams (Stewart & Gosain, 2006). People who are connected by affections and emotions are less likely to do knowledge contribution loafing since emotional identification fosters loyalty and citizenship behaviors in the group setting (Bergami & Bagozzi, 2000). Based on the above, we propose the following two hypotheses:

H1: Benevolence-based trust is negatively related to knowledge contribution loafing.
H2: Competence-based trust is negatively related to knowledge contribution loafing.

IBT is the degree to which a member believes the team members to be honest and reliable (Mayer et al., 1995). Study has indi-

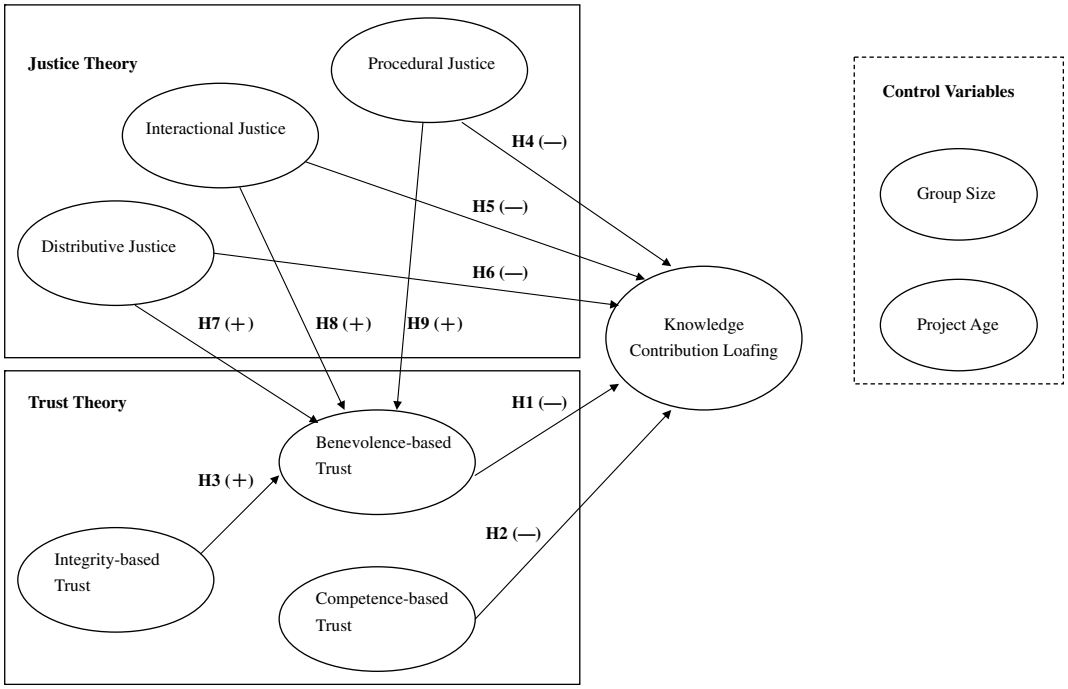

Fig. 1. Research model for knowledge contribution loafing.

cated that the stronger the IBT, the more open-minded team members are to each other (Panteli & Sockalingam, 2005). As the relationship deepens through their interactions over time, group members get more information about each other via their experience, and the positive trust, the IBT, will evolve and shift fluidly from IBT to the emotional bonds between individuals, i.e., BBT (Hsu et al., 2007; Panteli & Sockalingam, 2005). As a result, we assume that:

H3: Integrity-based trust is positively related to benevolence-based trust.

2.2.1. Linking justice to knowledge social loafing

Numerous researchers have argued that the concept of justice, like that of trust, is multidimensional and can also be defined in terms of three distinct dimensions – procedural justice (PJ), distributive justice (DJ), and interactional justice (IJ) (Bettencourt et al., 2005; Lin, 2007; Saunders & Thornhill, 2004). Procedural justice (PJ) is defined as the perceived fairness of the formal decision-making procedures used in a group (Bettencourt et al., 2005). Individuals' perceptions of the fairness of procedures may influence performance-to-outcome expectancies and thus influence the level of effort expended on task (Karau & Williams, 1995). Some studies have demonstrated a significantly negative correlation between PJ and social loafing (Liden et al., 2004). Interactional justice (IJ) refers to the perceived fairness of interpersonal treatment that a member receives from the other members (Bettencourt et al., 2005). The perception of whether he or she is fairly treated during communication affects an individual's willingness to cooperate and engage in the team task (Tyler & Blader, 2003). Murphy et al. (2003) further confirmed that IJ promotes high-quality relationships between leaders and subordinates, which in turn will negatively influence loafing behavior. Finally, distributive justice (DJ) is the perceived fairness of outcomes or rewards that a member receives from the organization. When people believe that the benefits outweigh the cost, they will certainly choose to withhold effort (Murphy et al., 2003). Therefore, fairness in the distribution of rewards or compensation has been shown to be negatively related to employees' loafing behavior (Liden et al., 2004). In short, we propose three hypotheses as follows:

H4: Procedural justice is negatively related to knowledge contribution loafing.
H5: Interactional justice is negatively related to knowledge contribution loafing.
H6: Distributive justice is negatively related to knowledge contribution loafing.

2.3. Linking justice to trust

Because trust is built by a series of satisfactory interactions, all the three justice perceptions have been identified as important factors to trust building in members (Lin, 2007; Pearce, Branyiczki, & Bakacsi, 1994; Saunders & Thornhill, 2004). This study focuses on the relationships between justice perceptions and BBT, since BBT, in comparison with other kinds of trust, plays the most critical role in KS, as pointed out by many research findings (Hsu et al., 2007; Panteli & Sockalingam, 2005).

First of all, the lack of distributive justice (DJ) will bring about grumbles over unfairly or poorly received rewards or treatment compared with what others get, and the complaints may further trigger anger and mistrust (a breaking of emotional bonds) in one's co-workers (Saunders & Thornhill, 2004). On the other hand, team members' voice and participation, i.e., the practice of procedural justice (PJ), grants those involved some right in the decision-making, which is usually an effective antidote to emotional hurt or mistrust (Lin, 2007; Pearce et al., 1994). Lastly, the way people are treated is likely to have a significant impact on the perceptions they form about interactional justice (IJ), which underpins their levels of trust in members (Saunders & Thornhill, 2004). When an individual in a group perceives he is inappropriately or irreverently treated by other members, he tends to perceive them to be

dishonorable and untrustworthy persons, and the moral perception will in turn work to lower emotional connections. Therefore, we propose three hypotheses as follows:

H7: Procedural justice is positively related to benevolence-based trust.
H8: Interactional justice is positively related to benevolence-based trust.
H9: Distributive justice is positively related to benevolence-based trust.

2.4. Control variables

Group size is chosen because it parsimoniously represents a team's structural and compositional context. Prior studies have suggested that group size is likely to have a positively significant effect on social loafing behavior (Chidambaram & Tung, 2005). According to Stewart and Gosain's research find (2006), project age (number of months since project inception) should be considered as an important factor in team members' input. As a result, group size and project age are implemented as control variables in our study.

3. Research methodology

3.1. Sampling procedure

An online survey was used to collect data for this study from January 1 to January 31, 2007. The unit of analysis is composed of individual employees from groups working in the MIS or IT department from a great diversity of organizations in Taiwan. To start with, some 500 organizations were randomly selected from Taiwan Yellow Pages. We sent e-mails to the managers in the MIS department, explaining the purpose of the research project and asking their willingness to participate. Then, e-mails or phone calls were made for further responses. In the end, forty-eight MIS managers agreed to participate and each of them expressed the willingness to forward the questionnaire e-mail to three to five persons to help conduct our survey.

The participants were advised to answer the questionnaire based on their experience of the project group which they just recently joined. In addition, we programmed the web pages so that all participants answer every measurement item to guarantee no missing values. Overall, of the 200 participants from 48 organizations, 157 usable data representing 157 groups were collected for analysis (after deleting 4 extreme cases in the data screening process), yielding a response rate of 78.5%. Non-participation is mainly due to the facts that the participants are in the team for just a short time, that the e-mail we sent was identified as spam-mail by their systems, or simply due to invalid e-mail accounts.

Demographic information about the project and individual participant was also collected (see Table 1). The average number of group member was 7 people, most of whommet every two weeks in average. Over 80% of the participants indicated that the project group was primarily conducted in a face-to-face mode because of limited media richness of Internet. In addition, time-trend extrapolation analysis was performed to test non-response bias. Results of early 25% and late 25% respondents of all measurement items showed non-significant differences (Wilks' Lambda = 0.35; $p = 0.73$). Finally, Harman's single-factor test was employed to address common method bias. Results revealed 7 factors with an Eigenvalue greater than one and no single-factor explained most of the variance (i.e., the variances explained ranged from 5.85% to 16.77%), indicating the absence of a significant variance common to the measures. Therefore, non-response bias and common method biases are minimized.

Table 1
Demographic characteristics of the sample

Demographic variable	Sample composition ($N = 157$)	
Gender	Male	111 (70.7%)
	Female	46 (29.3%)
Average Age		37 years old
Education	College (2 years)	17 (10.8%)
	Bachelor (4 years)	79 (50.3%)
	Master	58 (36.9%)
	Ph.D.	3 (2%)
Work Position	Senior manager	13 (8.3%)
	Middle manager	31 (19.7%)
	Supervisor	41 (26.1%)
	Clerical	26 (16.6%)
	Technical	46 (29.3%)
Industry	Manufacturing	35 (22.3%)
	Service	18 (11.5%)
	Hospital	11 (7.0%)
	Government	17 (10.8%)
	Information technology	42 (26.8%)
	Finance	10 (6.3%)
	Education	17 (10.8%)
	Others	7 (4.5%)
Role in the group	Leader	60 (38.2%)
	Member	97 (61.8%)
Project age	Less than 3 months	30 (19.1%)
	4–6 months	44 (28.0%)
	7–12 months	40 (25.5%)
	13–18 months	19 (12.2%)
	19–24 months	6 (3.8%)
	25–36 months	9 (5.7%)
	More than 37 months	9 (5.7%)
Group size	2–3 members	18 (11.5%)
	4–5 members	53 (33.8%)
	6–7 members	35 (22.3%)
	8–9 members	13 (8.3%)
	10–12 members	29 (18.4%)
	14–15 members	9 (5.7%)

3.2. Operationalization of constructs

Where available, constructs in this paper were to be measured using tested questions from prior studies which may be modified to enhance content validity of the scales used (Bock et al., 2006). All questions in the instrument were measured using seven-point scales anchored from 'strongly disagree' (1) to 'strongly agree' (7). Table 2 summarizes the questions measuring each construct in this study. In addition, group size was measured by the number of members reported by the participants. Project age was represented as the duration from the start to the end of, or to the present of the project ('1' = less than 3 months to '7' = more than 37 months).

Backward translation (with the material translated from English into Chinese, and back into English; versions compared; discrepancies resolved) was further used to ensure consistency between the Chinese and the original English version of the instrument. A pilot study was conducted involving five industry experts, six Ph.D. students and ten part-time master-degree students, from whose comments and suggestions on the item contents and structure of the instrument were solicited.

4. Data analysis and results

Partial least squares (PLS) was used in this study to test the soundness of our research model. PLS is preferred to LISREL here because our interest lies in assessing the predictive validity of KCL antecedents measured separately from trust and justice

Table 2
Summary of measurement scales

Construct	Measure	Mean	Std. dev.	Loading
Competence-base Trust (Mayer & Davis, 1999), *Cronbach's alpha = 0.95*				
I believe that our team members...				
CBT1	Are very capable of performing the project	5.34	1.10	0.93
CBT2	Will be successful at the things He/she tries to do	5.42	0.99	0.91
CBT3	Have much knowledge about the project that needs done	5.20	1.05	0.92
CBT4	Have specialized capabilities that can increase project performance	5.20	1.12	0.90
CBT5	are well qualified	5.18	1.02	0.92
Benevolence-based trust (Mayer & Davis, 1999), *Cronbach's alpha = 0.94*				
I believe that our team members...				
BBT1	Are very concerned about each other's welfare	5.17	1.04	0.90
BBT2	Place a high premium on each other's needs and desires	4.87	1.05	0.91
BBT3	Would not knowingly do anything to hurt each other	5.69	1.10	0.84
BBT4	Really look out for what is important to each other	5.15	1.08	0.92
BBT5	Will go out of his/her way to help each other	5.21	1.07	0.92
Integrity-based trust (Mayer & Davis, 1999), *Cronbach's alpha = 0.93*				
I believe that our team members...				
IBT1	Have a strong sense of justice	5.12	1.12	0.87
IBT2	Will stick to his/her word	5.31	1.00	0.90
IBT3	Try hard to be fair in dealings with others	5.13	1.08	0.92
IBT4	Are very consistent with actions and behaviors	5.08	1.12	0.90
IBT5	Are guided by sound principles	5.15	1.02	0.86
Procedural justice (Bettencourt et al., 2005; Karatepe, 2006), *Cronbach's alpha = 0.94*				
When assignment about project work are made ...				
PJ1	The concerns of all members affected by the decisions are heard	5.04	1.17	0.92
PJ2	Opportunities are provided to appeal or challenge the decisions	5.19	1.18	0.92
PJ3	Requests for clarification and additional information about the decisions are allowed	5.26	1.16	0.90
PJ4	Members' complaints are handled in a very timely manner	4.87	1.08	0.89
PJ5	Members' complaints are resolved as quickly as it should be	4.89	1.16	0.89
Interactional justice (Karatepe, 2006), *Cronbach's alpha = 0.95*				
Members in the work group...				
IJ1	Are courteous to each other	5.32	1.14	0.91
IJ2	Are honest with each other	5.28	1.09	0.91
IJ3	Show concern to each other	5.11	1.15	0.92
IJ4	Communicate with each other appropriately	5.30	1.16	0.93
IJ5	Put the proper effort into resolving my problem	5.23	1.16	0.93
Distributive justice (Bettencourt et al., 2005), *Cronbach's alpha = 0.97*				
Members in the work group are fairly rewarded...				
DJ1	For the investments in time and energy that he/she has made in project work	4.65	1.21	0.93
DJ2	For the roles of project work assigned to him/her	4.72	1.16	0.94
DJ3	Compared to what our team earns from his/her work	4.78	1.13	0.93
DJ4	For the amount of project work he/she puts forth	4.74	1.18	0.95
DJ5	Considering the responsibilities, stresses and strains of project work he/she has	4.69	1.25	0.94
Knowledge contribution loafing (Kidwell & Robie, 2003), *Cronbach's alpha = 0.96*				
In group discussion for knowledge sharing, ...				
KCL1	I sometimes show up late even when I could make it in on time	2.39	1.00	0.90
KCL2	I contribute less knowledge than I know I can	2.39	0.94	0.93
KCL3	I give less effort on knowledge contribution than other members	2.45	1.01	0.92
KCL4	I take it easy if others are around contributing his/her knowledge	2.30	0.95	0.93
KCL5	I sometimes daydream	2.41	1.01	0.90
KCL6	I sometimes call in sick even when I am not sick	2.12	1.03	0.90

responses, with the focus more on the paths than on the model appropriate. In addition, one of the chief advantages of PLS over LISREL is that sample sizes can be as low as 30 observations still with robust results (Gary & Terry, 2003). Finally, PLS makes no prior distributional assumption about the data and provides a good approach for testing structural models when the sample size is limited (Fornell & Bookstein, 1982). As a result, the sample in this study of 157 groups is too small to adequate for LISREL analysis.

PLS analysis involves two stages: (1) assessment of the measurement model, examining the item reliability, convergent validity, and discriminant validity, and (2) assessment of the structural model.

4.1. Assessment of the measurement model

The internal consistency of each dimension was assessed by computing the Cronbach's alpha. As shown in Table 2, the lowest value of Cronbach's alpha is 0.93 for integrity-based trust, all well exceeding Nunnally's criterion of 0.70 (Nunnally, 1978).

Convergent validity is assessed by three tests: loadings of each measurement item, composite reliability (CR), and average variance extracted (AVE). Loadings for the items of the constructs are expected to be at 0.70 or above to achieve convergent validity (Chin & Newsted, 1999). As summarized in Table 2, all of the items had loadings over 0.70 for their respective constructs. A greater

Table 3
Discriminant validity and correlations

Construct	AVE	CR	Construct							
			PJ	IJ	DJ	IBT	BBT	CBT	KCL	Gsize
PJ	0.82	0.96	**0.91**							
IJ	0.85	0.97	0.74	**0.92**						
DJ	0.88	0.97	0.68	0.64	**0.94**					
IBT	0.79	0.95	0.64	0.76	0.60	**0.89**				
BBT	0.81	0.95	0.73	0.78	0.68	0.74	**0.90**			
CBT	0.84	0.96	0.67	0.65	0.56	0.73	0.70	**0.92**		
KCL	0.83	0.97	-0.57	−0.64	−0.43	−0.51	−0.67	−0.52	**0.91**	
Gsize	1	1	-0.01	−0.07	−0.15	−0.03	−0.02	0.01	0.00	**1.00**
Pjage	1	1	-0.09	−0.09	−0.15	−0.07	−0.10	−0.15	0.06	0.30

CR = composite reliability; AVE = average variance extracted; PJ = procedural justice; DJ = distributive justice; IJ = interactional justice; CBT = competence-base trust; BBT = benevolence-based trust; IBT = integrity-based trust; KCL = knowledge contribution loafing; Gsize = group size; Pjage = project age.
Diagonal elements are the square root of AVE. These values should exceed the inter-construct correlations for adequate discriminant validity.

than 0.8 CR value together with a no-less-than 0.5 AVE value is a prerequisite for satisfactory convergent validity for a construct (Fornell & Bookstein, 1982). As summarized in Table 3, the CRs for the constructs with multiple items range from 0.95 to 0.97 and the AVEs from 0.79 to 0.88, all well above the cutoff, showing acceptable convergent validity.

For satisfactory discriminant validity, the AVE for a construct should be greater than the squared correlations of the construct and other constructs in the model (Chin & Newsted, 1999). Table 3 shows the correlations between the constructs. In this table, the diagonal elements represent the square root of the variance shared between the constructs and their measures. The off-diagonal elements are the correlations among the constructs. All diagonal elements are greater than their corresponding off-diagonal elements, suggesting that the respective constructs exhibit acceptable discriminant validity. Furthermore, all the items load more highly on their own construct than on other constructs in the model. Therefore, the items demonstrated satisfactory convergent and discriminant validity.

4.2. Assessment of the structural model

The path significance of each hypothesized association in the research model and the variance explained (R^2) by each path were then examined. Six out of the nine hypotheses were found significant. The R^2 value for knowledge contribution loafing (KCL) is .500, indicating approximately 50% of the variance in the model is explained both by the trust and justice dimensions.

Fig. 2 shows the result of path coefficients. The results indicate that IJ and BBT had significantly negative relationship with KCL (.3 and .25, respectively). H1 and H5 were supported. However, PJ, DJ and CBT did not show significantly negative relationship with KCL. H4, H6 and H2 were not supported. Finally, BBT is significantly and positively influenced by PJ, DJ, IJ and IBT. Therefore, H3, H7, H8 and H9 were supported. The percentage of the variance explained (R^2) of BBT is 71%.

As for the control variables, both project age and group size did not show significantly relationships with knowledge contribution loafing, indicating that the effects of project age and group size were minimized in the current research.

5. Discussions and implications

Based on Social Exchange Theory, which is further augmented with Trust and Justice theories, this study empirically investigates the determinants of knowledge contribution loafing in IS project teams and tries to illuminate the puzzling frequent occurrence: even if people are willing to share their knowledge, why don't they share in their full capacity and, more poignantly, why isn't the whole body of knowledge accurately and fully shared?

In the justice dimension, the results indicate that, among the three types of justice, interactional justice (IJ) not only is the solely one to exhibit a significantly negative relationship with KCL, but it also has the strongest impact on benevolence-based trust (BBT). Such results support the contention of justice theory that IJ affects an individual's outcome evaluations (i.e., effort exerted in knowledge contribution or BBT) more than both procedural justice (PJ) and distributive justice (DJ) do (Collie, Collie, Bradley, & Sparks, 2002). Such findings correspond to an important aspect of knowledge sharing, the stress on interpersonal communication. It can therefore be further inferred that, fair interpersonal relationship between members will effectively make them more willing to share knowledge. Although non-significant relationship is found between PJ and KCL, the former indeed has certain negative impact on the latter. Such a finding is consistent with what Liden et al. (2004) concluded in their research. They further argued that it is possible that in some other settings, PJ may play a stronger role in determining the extent to which individuals engage in social loafing. These findings suggest that the fairness in decision-making process should also be taken into consideration in effectively reducing KCL.

Contrary to our hypotheses, distributive justice (DJ) has a positive, though not significant, relationship with KCL, which is more in alignment with Bock and Kim's (2002) findings that reward systems are not the most important incentive to motivating people to share knowledge. At the initial stage to encourage knowledge sharing, reward systems might be useful. However, the reward system instituted to serve as a positive reinforcement is often taken as granted as time passes. When rewards are taken as a routine practice, the reward system may bring about an unexpected punitive effect – once substantive reward is not given, people may perceive it to be the opposite of reward, or even an outright punishment (Bock & Kim, 2002). When reward system loses some of its currency and turns to be punitive, it fails to curb social loafing effectively in knowledge contribution. Part of the reason that the reward system does not work well may be out of the fact that currently most of the organizations surveyed do not have substantial reward programs for knowledge sharing. In sum, further studies will be needed to strengthen this proposition.

As for the trust dimension, the result of this study indicates that benevolence-based trust (BBT) plays the most important role in KCL. This finding is in line with numerous KS studies (Hsu et al., 2007; Panteli & Sockalingam, 2005). When members do care about each other, the empathy and the benevolence will enable an individual to do and think more in other member's shoes, and more willing to contribute his own knowledge. In addition, since the

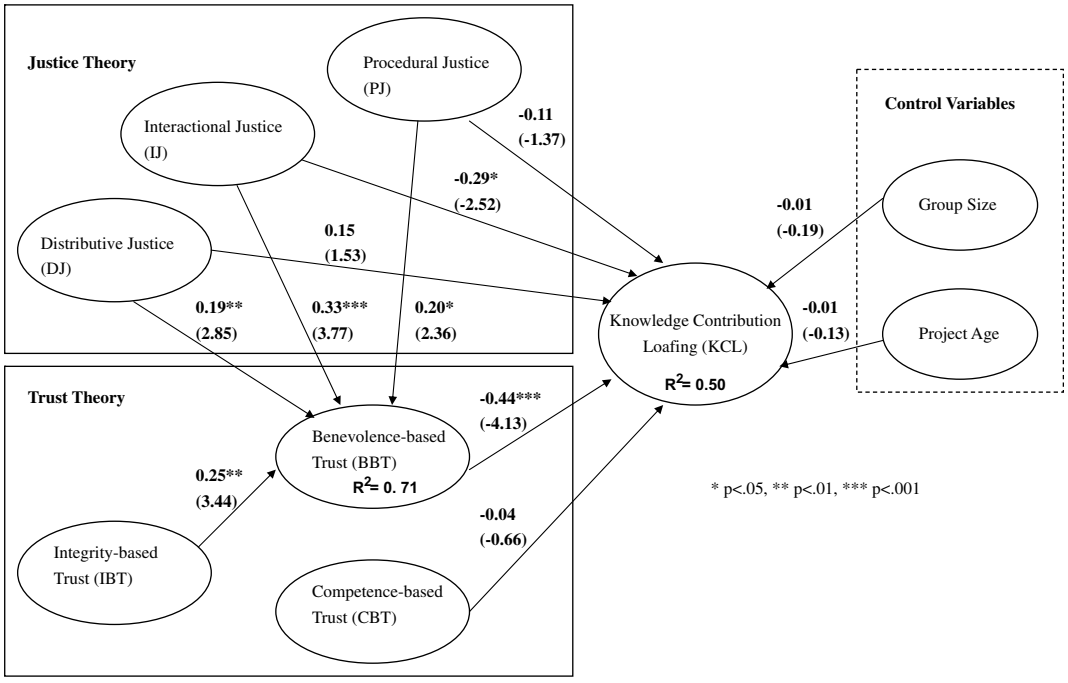

Fig. 2. Knowledge contribution loafing structural model result.

building of BBT centers primarily around common interests, goals, values and principles (Hsu et al., 2007), in this study we find that BBT, which has been explained up to 71% of the variance, can be magnified by the building of all these three types of justice and also by intensifying integrity-based trust (IBT).

Competence-based trust (CBT), on the other hand, exhibits non-significant also not strongly negative path coefficient with KCL. The result is partially in accordance with Ardichvili et al.'s proposition (2003) that CBT forms a major barrier to knowledge sharing. If a member perceives his or her own capabilities are significantly lower than those of other members, the motivation to energetically share knowledge may be reduced for the fear of criticism or ridicule, and the fear will in turn contribute to more loafing. In short, the result of our study suggests the vaguely ambivalent nature of CBT qualifies CBT's effectiveness to inhibit social loafing in an individual's knowledge sharing. More studies are still needed to corroborate this finding.

6. Contributions

As the first research paper to empirically study social loafing in the context of knowledge sharing, the SET-based KCL model may shed some light on better understanding of KCL, its antecedents and their relationships in project teams. In sum, the contributions of the present study are mainly threefold: First, this study extends trust theories to the domain of social loafing research. Although researchers have identified several conditions which can curb group members' propensity to social loafing (George, 1992; Karau & Williams, 1995; Kidwell & Bennett N., 1993), few have investigated KCL from the perspectives of trust. Second, in our study the implications of justice in social loafing are brought in to the context of knowledge sharing. Although justice, much like the concept of trust, has been identified as an important influence to social loafing (Liden et al., 2004; Murphy et al., 2003), rarely has this concept been applied in knowledge sharing. Third, by adopting the three types of justice and three types of trust, this study provides a critical appraisal of KCL. There is a paucity of research in examining all the three types of trust together with the three types of justice simultaneously in knowledge sharing or social loafing. In investigating the intricate relationship among the six constructs and KCL, while at the same time endowing a cause and effect relationship between the three types of justice and benevolence-based trust (BBT), this study hopes to provide an integrative and comprehensive understanding of the dynamics in trust and justice in the content of KCL.

7. Limitations and future research

Some limitations must be acknowledged to be inherent in this study, however. First, to achieve generality, an individual member is taken to represent the whole project group. Future studies may well minimize this bias by using a team as an analysis unit and surveying more participants in a project group. Second, based on the cross-sectional research methodology, this study investigates both three types of justice and trust perceptions at the same time. Further studies may prove fruitful to observe each subdivision of trust and justice in different phases in a longitudinal methodology so as to give a fuller picture on how trust interacts with justice in KCL. Last but not least, the issue of cultural difference, such as power distance, individualism versus collectivism, gender difference, etc., is not addressed because of the regional sampling (with the samples concentrated solely in Taiwan). Future studies may well extend to take into account the cultural discrepancies by recruiting more sampling subjects with different cultural background.

References

Abrams, L. C., Cross, R., Lesser, E., & Levin, D. Z. (2003). Nurturing interpersonal trust in knowledge-sharing networks. *Academy of Management Executive, 17*(4), 64–77.

Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management, 7*(1), 64–77.

Bennett, N., & Naumann, S. E. (2004). Withholding effort at work: Understanding and preventing shirking, job neglect, social loafing, and free-riding. In C. L.

Martin & R. E. Kidwell (Eds.), *Managing organizational deviance*. Newbury Park, CA: Sage.

Bergami, M., & Bagozzi, R. P. (2000). Self-categorization, affective commitment and group self-esteem as distinct aspects of social identity in the organization. *British Journal of Social Psychology, 39*(4), 555–577.

Bettencourt, L. A., Brown, S. W., & MacKenzie, S. B. (2005). Customer-oriented boundary-spanning behaviors: Test of a social exchange model of antecedents. *Journal of Retailing, 81*(2), 141–157.

Blau, P. M. (1964). *Exchange and power in social life*. New York: Wiley.

Bock, G. W., Kankanhalli, A., & Sharma, S. (2006). Are norms enough: The role of collaborative norms in promoting organizational knowledge seeking. *European Journal of Information Systems, 15*(4), 357–367.

Bock, G. W., & Kim, Y. G. (2002). Breaking the myths of rewards: And exploratory study of attitudes about knowledge sharing. *Information Resources Management Journal, 15*(2), 14–21.

Brookes, N. J., Morton, S. C., Dainty, A. R. J., & Burns, N. D. (2006). Social processes, patterns and practices and project knowledge management: A theoretical framework and an empirical investigation. *International Journal of Project Management, 24*, 474–482.

Chidambaram, L., & Tung, L. L. (2005). Is out of sight, out of mind? An empirical study of social loafing in technology-supported groups. *Information Systems Research, 16*(2), 149–168.

Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. In R. H. Hoyle (Ed.), *Statistical strategies for small sample research* (pp. 307–341). London: Sage Publications.

Collie, T. A., Collie, T., Bradley, G., & Sparks, B. A. (2002). Fair process revisited: Differential effects of interactional and procedural justice in the presence of social comparison information. *Journal of Experimental Social Psychology, 38*, 545–555.

Comer, D. R. (1995). A model of social loafing in real work groups. *Human Relations, 48*(6), 647–667.

Fornell, C., & Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit voice theory. *Journal of Marketing Research, 19*, 440–452.

Gary, F. T., & Terry, A. B. (2003). Determinants of the relative advantage of a structured SDM during the adoption stage of implementation. *Information Technology and Management*, 20 409–428.

George, J. M. (1992). Extrinsic and intrinsic origins of perceived social loafing in organizations. *Academy of Management Journal, 35*(1), 191–202.

Homans, G. C. (1961). *Social behavior: Its elementary forms*. New York: Harcourt Brace.

Hsu, M. H., Ju, T. L., Yen, C. H., & Chang, C. M. (2007). Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations. *International Journal of Human–Computer Studies, 65*, 153–169.

Kankanhalli, A., Tan, B. C. Y., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: An empirical investigation. *MIS Quarterly, 29*(1), 113–143.

Karatepe, O. M. (2006). Customer complaints and organizational responses: the effects of complainants' perceptions of justice on satisfaction and loyalty. *International Journal of Hospitality Management, 25*(1), 69–90.

Karau, S. J., & Williams, K. D. (1995). Social loafing: Research findings, implications, and future directions. *Current Directions in Psychological Science, 4*, 134–139.

Kern, T., & Willcocks, L. (2002). Exploring information technology outsourcing relationships: theory and practice. *Journal of Strategic Information Systems, 11*, 3–19.

Kerr, N. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology, 45*, 819–828.

Kidwell, R. E., & Bennett, N. (1993). Employee propensity to withhold effort: A conceptual model to intersect three avenues of research. *Academy of Management Review, 18*, 429–456.

Kidwell, R. E., & Robie, C. (2003). Withholding effort in organizations: toward development and validation of a measure. *Journal of Business and Psychology, 17*(4), 537–561.

King, W. R., & Marks, P. V. (2008). Motivating knowledge sharing through a knowledge management system. *Omega, 36*(1), 131–146.

Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science, 50*(11), 1477–1490.

Liden, R. C., Wayne, S. J., Jaworski, R. A., & Bennett, N. (2004). Social loafing: A field investigation. *Journal of Management, 30*(2), 285–304.

Lin, C. P. (2007). To share or not to share: Modeling tacit knowledge sharing, its mediators and antecedents. *Journal of Business Ethics, 70*, 411–428.

Mayer, R. C., & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management – A field quasi-experiment. *Journal of Applied Psychology, 84*(1), 123–136.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709–734.

Murphy, S. M., Wayne, S. J., Liden, R. C., & Erdogan, B. (2003). Understanding social loafing: The role of justice perceptions and exchange relationships. *Human Relations, 56*(1), 61–84.

Nooteboom, B. (1996). Trust, opportunism and governance: A process and control model. *Organizational Studies, 17*, 985–1010.

Nunnally, J. C. (1978). *Psychometric Theory*. New York: McGraw-Hill Book Company..

Panteli, N., & Sockalingam, S. (2005). Trust and conflict within virtual interorganizational alliances: A framework for facilitating knowledge sharing. *Decision Support Systems, 39*(4), 599–617.

Pearce, J. L., Branyiczki, I., & Bakacsi, G. (1994). Person-based reward systems: A theory of organizational reward practices in reform-communist organizations. *Journal of Organizational Behavior, 15*, 261–282.

Saunders, M., & Thornhill, A. (2004). Trust and mistrust in organizations: An exploration using an organizational justice framework. *European Journal of Work and Organizational Psychology, 13*(4), 493–515.

Simons, T. (2002). Behavioural integrity: The perceived alignment between managers' words and deeds as a research focus. *Organization Science, 13*(1), 18–35.

Stewart, K. J., & Gosain, S. (2006). The impact of ideology on effectiveness in Open Source software development teams. *MIS Quarterly, 30*(2), 291–314.

Tyler, T., & Blader, S. (2003). The group engagement model: Procedural justice, social identity and cooperative behavior. *Personality and Social Psychology Review, 7*, 349–361.

Wasko, M. M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly, 29*(1), 35–57.

Williams, K. D., Harkins, S., & Latané, B. (1981). Identifiably as a deterrent to social loafing: Two cheering experiments. *Journal of Personality and Social Psychology, 40*, 303–311.