

A Study on the Influencing Factors of the Intention to Share Tacit Knowledge in the University Research Team

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Abstract—The aim of our study was to explore the influencing factors of the intention to share tacit knowledge in the university research team. On the basis of related literature review, combing with the Theory of Planned Behavior, we proposed a research model about the intention to share tacit knowledge in the university research team. After the completion of questionnaire, we surveyed of 202 researchers from the university research teams of Chinese mainland, and examined the research model by using Structural Equation Modeling (SEM), and then revised theoretical model. We found that, in the university research team, personal feature (need satisfaction, sense of honor and altruism), internal mechanism (interpersonal trust, team cohesion and authorized leadership), and support framework (resources adequacy and self-efficacy) significantly contributed to the intention to share tacit knowledge, however, heterogeneity significantly had a negative effect on the intention to share tacit knowledge. Finally, we provided some useful strategies and suggestions for university managers and team leaders to enhance the intention to share tacit knowledge of university research team.

Index Terms—university research team; tacit knowledge; knowledge sharing; tacit knowledge sharing; intention to share tacit knowledge

I. INTRODUCTION

Scientific research is the basic function of university. As an important indicator of the level of scientific research, innovative scientific achievements are often the results of depth, peripherization and chiasm of discipline construction in the university. To get innovative scientific achievements, university researchers must break discipline limitations down and achieve amalgamation and innovation of various disciplines. As the main force of scientific research work in the university, university research team is playing an increasing role. Therefore, how to improve the research capability of university research team has become the concerned focus of university's managers and researchers.

In the whole process of team management, tacit knowledge sharing plays a crucial role in the university

research team^[1]. The reason is that, innovative ideas first exist in the brain in the form of tacit knowledge which is the source of research innovation (Polany, 1958; Eucker, 2007). Recent studies about research practice in the university showed, due to the pattern, characteristic^[2] of tacit knowledge and the exclusiveness^[3] of knowledge owners, some team members often are reluctant to share their tacit knowledge with others. This inhibits innovative capability of university research team. So, what are the crucial influencing factors of the intention to share tacit knowledge in the university research team? Currently, studies about this aspect are seldom, and even these researches have some limitations: (1) most of previous studies focus on the qualitative analysis and discussion about the influencing factors of knowledge exchanging and sharing in the university research team, whereas empirical study about this aspect is rare; (2) most of previous researches pay more attention to the explicit knowledge sharing, and do not make a sufficient study on the intention to share tacit knowledge.

Because the university research team is made up of individuals, therefore, from the perspective of individual tacit knowledge sharing, we can easily study the influencing factors of intention to share tacit knowledge in the university research team. Consequently, on the basis of related literature review, with the help of the theory of planned behavior which was applied extensively in the individual behavior fields, we proposed a theoretical model about the intention to share tacit knowledge in the university research team. After examining and revising the model, we finally provided some suggestions about improving the intention to share tacit knowledge for universities.

II. THE RESEARCH MODEL AND HYPOTHESES

A. The research model

Tacit knowledge sharing in the university research team is a behavior of team member. About the general decision making process of individual behavior, Fishbein and Ajzen first proposed the Theory of Reasoned Action

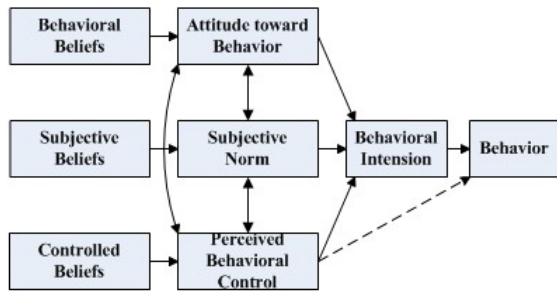


Figure 1. The model of planned behavior theory

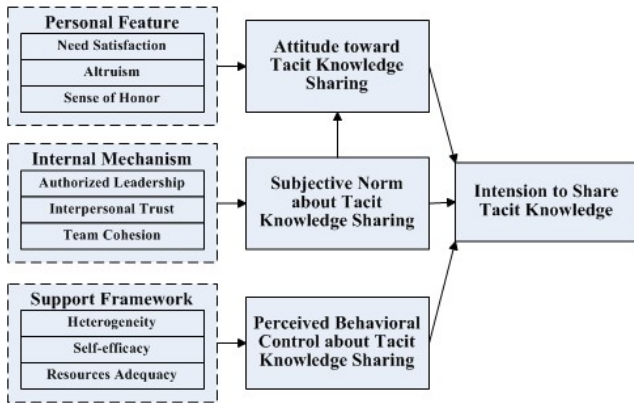


Figure 2. The conceptual model of intention to share tacit knowledge in the university research team

(TRA)^[4] on the basis of multi-attribute attitude model to explain it. Because TRA assumed that individual behavior was controlled by volition, the explanatory power of this theory will be inadequate when some behaviors are not entirely under the control of volition. In order to strengthen the predictive ability of TRA, Ajzen added a variable called perceived behavioral control into it and then proposed the Theory of Planned Behavior. Figure 1 shows the model of planned behavior theory.

Owing to the strong explanatory power of TPB^[5], we adopted the research framework of Ajzen et al., combined with an integrative framework of knowledge transfer which proposed by Sweep^[6], considered internal mechanism (authorized leadership, interpersonal trust and team cohesion), personal feature (need satisfaction, altruism, and sense of honor), and support framework

(heterogeneity, self-efficacy, and resources adequacy) as subjective norm of tacit knowledge sharing, sharing attitude of tacit knowledge and perceived behavioral control of tacit knowledge sharing respectively, and proposed a conceptual model about the intention to share tacit knowledge in the university research team (Figure 2).

Based on the conceptual model, we proposed a research model (Figure 3).

Table I outlines the definitions of the constructs in conceptual and research model.

B. Research hypotheses

Based on the above research model, we proposed the following research hypotheses.

Wilson (1975) believed that people’s altruism has a crucial significance on human’s survival and continuation. Owing to possessing positive and public-spirited nature, some are pleased to share knowledge with others and don’t require return (Davenport, Prusak, 1998). Constant (1994) hold that selfish people have a passive influence on information sharing, while altruist play a positive role in knowledge sharing. This lead to our first hypothesis:

H1: Altruism has a direct and positive effect on the intention to share tacit knowledge.

Davenport et al. (1998) thought that, one’s time, energy, and knowledge are finite, people do not want to share knowledge with others unless it is profitable. Similarly, members who contribute tacit knowledge to others hope that they can get material or spiritual compensation in the university research team, such as others’ recognition and respect, self-realization, and so on. Therefore, satisfying team members’ needs as far as possible would promote members’ intention to share tacit knowledge. This lead to our second hypothesis:

H2: Need satisfaction has a direct and positive effect on the intention to share tacit knowledge.

Davenport et al. (1998) believed that spreading knowledge would make knowledge owners build a “wisdom” image, so, they are willing to share precious knowledge which they own with others. Team members try their best to pursue sense of honor, consequently, they would get high reputation, and they also promote the spread of information and thinking. The subjects who

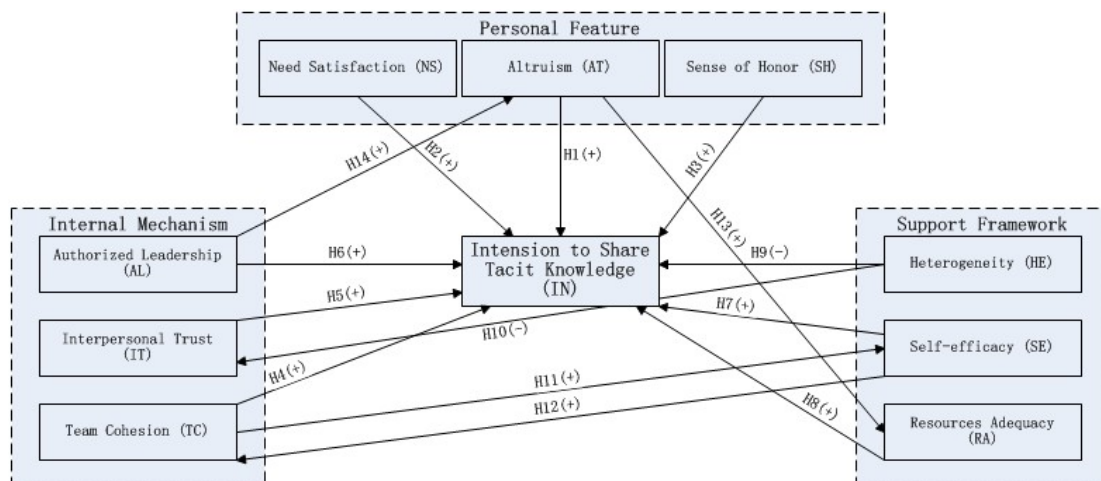


Figure 3. Research model and hypotheses

TABLE I. DEFINITIONS OF CONSTRUCTS

Constructs		Definitions	References
Intention to share tacit knowledge		The degree of one's belief that one will engage in tacit knowledge-sharing behavior	Ajzen (1985)
Attitude toward tacit knowledge sharing		The degree of one's favorable or positive feeling about sharing one's tacit knowledge	Fishbein, Ajzen (1975) Robbins (1993)
Subjective norm about tacit knowledge sharing		The degree of one's perceived social pressure from important others to share or not to share one's tacit knowledge	Fishbein, Ajzen (1975)
Perceived behavioral control about tacit knowledge sharing		The difficult degree of one's feeling about sharing tacit knowledge with others and the degree that one will be to control or determine tacit knowledge sharing	Ajzen (1985)
Personal feature	Need satisfaction	The degree of one's satisfaction about material or spiritual compensation because of sharing tacit knowledge with others	A. Maslow (1943), Tampoe (1993), Scott, Walker (1995)
	Altruism	One is pleased to share knowledge with others but doesn't require return	Trivers (1971), Bar-Tal (1986)
	Sense of honor	One feeling of a member about achieved reward and positiveness	Davenport(1998)
Internal mechanism	Authorized leadership	A leadership style to mobilize and motivate team members to carry on research work by authorizing power	House, Mitchell (1974)
	Team cohesion	The degree of interattraction and participation for common goal among members	Back (1965), Aharon Tziner (2002)
	Interpersonal trust	The unification of psychological expectations and behavioral strategies set up in interpersonal interaction	Wrightman (1990), Costa (2003)
Support framework	Heterogeneity	One's difference with others in individuality, gender, attitude, background and experience	Blau (1977), Jackson, Stone, Alvarez (1993)
	Self-efficacy	The belief that one is capable of sharing tacit knowledge with others	Albert Bandura (1977)
	Resources adequacy	Resources of promoting intention to share tacit knowledge	Davenport, Prusak (1998)

own sense of honor and tacit knowledge would overcome the psychological barriers of "knowledge is private", and they will be willing to lend a helping hand to solve problems when some members encounter research difficulties. This lead to our third hypothesis:

H3: Sense of honor has a direct and positive effect on the intention to share tacit knowledge.

Team cohesion mainly contains task cohesion and social cohesion (Hagstron, 1965; Mikalahck, 1969). In the university research team, team cohesion makes members have intense belongingness. In order to achieve team's goal and interest, they would be willing to try their best to work hard and play their potentiality, so, it is more possible that they would share tacit knowledge with others. Conversely, the weaker team cohesion, the weaker positivity and initiative that members contribute to team, thus it is impossible that members are willing to diffuse and transfer tacit knowledge to others [7]. This lead to our fourth hypothesis:

H4: Team cohesion has a direct and positive effect on the intention to share tacit knowledge.

Emerson (1962) and Blau (1964) pointed out that trust is the key factor of exchange. Nahapiet and Ghoshal (1998) believed that interpersonal trust can promote the sharing of intellectual capital. The intention to share tacit knowledge is a precondition of tacit knowledge sharing, but the trust degree between knowledge owners and recipients is the main factor which influences the intention to share tacit knowledge [8]. This lead to our fifth hypothesis:

H5: Interpersonal trust has a direct and positive effect on the intention to share tacit knowledge.

Authorized leadership encourages junior autonomous behavior and members' teamwork [9]. Kirkman and Rosen (1999) pointed out that authorization is positive

correlation with job satisfaction. It is more probable that team members would contribute to their knowledge for team interest if members have high job satisfaction. This lead to our sixth hypothesis:

H6: Authorized leadership has a direct and positive effect on the intention to share tacit knowledge.

Self-efficacy is the core variable of controlling and arousing human's motivation and behavior [10]. High self-efficacy would promote individual effort to strive for success, and then the successful result would further strengthen the expectation of success. On the contrary, low self-efficacy might lead to that individual ceases effort, and cause the frustrated result, and weaken the competence's expectation. This lead to our seventh hypothesis:

H7: Self-efficacy has a direct and positive effect on the intention to share tacit knowledge.

The view of resources systems is the core point of view in the resource-based view [11]. One needs to consider the coordination of a lot of resources when he carries out some behavior, such as time, skill, individual knowledge, and so on. It is bad for knowledge sharing when some resources (like knowledge, time, place, cultural climate of knowledge sharing, etc) of knowledge sharing are shortage (Szulanski, 1996; Jiang Tianhui, 2000; Yuan Lin, 2007). This lead to our eighth hypothesis:

H8: Resources adequacy has a direct and positive effect on the intention to share tacit knowledge.

Generally, people believed that heterogeneity has a passive on the emotional responses, like cohesion, degree of satisfaction, team commitment, etc. The higher heterogeneity in team, the higher communication barrier among members to knowledge sharing [12], so, cooperation becomes difficult among members (O' Reilly,

Caldwell, Barnett, 1989). This lead to our ninth hypothesis:

H9: Heterogeneity has a direct and negative effect on the intention to share tacit knowledge.

Tsui et al. found that individuals have a low loyalty toward organization when they have a big difference in the aspects of gender, age, race, etc. In the university research team, the heterogeneity of age will increase emotional conflict (Jehn, 1997). Different specialized fields would influence confidence (Zenger T R, Lawrence B S., 1989). It is more probable that research team would come about team confidence if the heterogeneity of research team is low. This lead to our tenth hypothesis:

H10: Heterogeneity has a direct and negative effect on the interpersonal trust.

Mayer et al. (1985) pointed out interpersonal trust is that, according to counterpart's personal characteristics (such as capability, honesty, and so on), one generates a reliable and dependable brief toward others. In face of research difficulties, the climate of mutual trust among team members would strength members' confidence and would activate members' potentiality, and then reinforce members' self-efficacy. This lead to our eleventh hypothesis:

H11: Interpersonal trust has a direct and positive effect on the self-efficacy.

Mathiesu and Zajiac (1990) believed that the members of high self-efficacy have high community identity, so they give community a more positive evaluation. The individuals who own high self-efficacy would be willing to devote themselves into organizations. Therefore, the university research team which owns high self-efficacy would enhance team cohesion^[13]. This lead to our twelfth hypothesis:

H12: Self-efficacy has a direct and positive effect on the team cohesion.

The existence of altruism would promote the forming of knowledge sharing climate. Altruistic behavior would come about when people feel good about the group where they live in, so people would be more willing to contribute to the group^[14]. From this perspective, we can think that altruism would invisibly increase resources of university research team. This lead to our thirteenth hypothesis:

H13: Altruism has a direct and positive effect on resources adequacy.

Authorized leadership respects members' suggestion, encourages junior autonomous behavior, discusses team's development direction and striving goal with members, and even codetermine the stage goal with junior (P.Hersey, K.H. Blanchard, 1993). This leadership can build a cooperation climate, promote members to identify team, and make everyone disregard personal interest to work hard for team goal. This lead to our fourteenth hypothesis:

H14: Authorized leadership has a direct and positive effect on altruism.

III. RESEARCH MOTHODOLOGY AND ANALYSIS

To test the model, we adopted a survey method for data collection and examined the hypotheses using structural equation modeling (SEM) on the data.

A. Measurement and data collection

We developed measurement items by adopting measures that had been validated in prior studies, modifying them to fit our context of tacit knowledge sharing in the university research team. Omit to the restrictions of content space, we does not list the questionnaire items.

Respondents were asked to evaluate the significance of measurement items using a Likert scale of 1–5, where a value of 5 represented “strongly agree,” and 1 represented “strongly disagree.”

The study sample consisted of researchers who contained research team leaders and juniors from Chinese mainland's universities randomly selected from the directory of Chinese universities.

We started to collect data in 2009/03. In the first stage, we carried out pre-surveying. In the second stage, we began to formally dispense questionnaire which contained electronic and papyry edition. A total of 305 questionnaires were sent, and a total of 267 replies were returned. Though 65 were incomplete and so discarded, 202 questionnaires were used for data analysis, a response rate of 66.2%. Table II shows the demographics of the respondents. Respondents had obviously attained a significant degree of knowledge and experience from their education and jobs.

TABLE II. DEMOGRAPHIC INFORMATION OF RESPONDENTS*

Measure	Items	Frequency	Percent
Gender	Male	122	60.4%
	Female	80	39.6%
Age	≤20	0	0
	20-30	134	66.3%
	30-40	44	21.8%
	40-50	18	9.0%
	≥50	6	2.9%
Education background	PH. D.	66	32.7%
	Postgraduate	132	65.3%
	Undergraduate	4	2%
	Post-secondary and below	0	0
Title	Professor	21	10.4%
	Associate professor	16	8.0%
	Lecturer	33	16.3%
	Assistant	34	16.8%
	Other	98	48.5%

* Sample size = 202.

B. Empirical analysis

We first analyzed the reliability and the validity, and determined the significance of the model using SEM, and finally revised the research model.

1) Reliability test

Regarding exploring research, if the cronbach's alpha coefficient is bigger than 0.7, it is the acceptable minimum value of reliability^[15]. Table III shows the

TABLE III. RELIABILITY TEST

Constructs	Measurement items	Cronbach's alpha	Number of items
Intention to share tacit knowledge	Q1-Q5	0.731	5
Need satisfaction	Q6-Q10	0.752	5
Altruism	Q11-Q14	0.756	4
Sense of honor	Q15-Q18	0.758	4
Heterogeneity	Q19-Q23	0.713	5
Authorized leadership	Q24-Q28	0.773	5
Interpersonal trust	Q29-Q33	0.762	5
Team cohesion	Q34-Q38	0.754	5
Self-efficacy	Q39-Q43	0.803	5
Resources adequacy	Q44-47	0.813	4

TABLE IV. KMO AND BARTLETT TEST

Variables	KMO	DF	Sig.
Personal feature	0.760	78	0.000
Internal mechanism	0.757	105	0.000
Support framework	0.721	78	0.000

reliability test. In this research, all cronbach's alpha ranged from 0.71 to 0.81; these are greater than 0.7 and so the constructs were considered reliable.

2) *Validity test*

In order to guarantee measurement's content validity, firstly, we adopted measures that had been validated in prior studies and revised them to fit our research; second, we consulted some knowledge management experts about measurement items and then modified them; thirdly, during the pre-surveying, we invited some respondents to provide their ideas about measurement' readability and intelligibility, and then revised them. Consequently, the content validity of measurement items was considered as good.

Because our measurement items had been modified according to prior studies, it was necessary to examine the structure validity by exploratory factor analysis. We used spss13.0 to play KMO test and Bartlett test, Table IV summarizes the test results.

Every KMO was bigger than 0.5, and every Bartlett's globular test was significant. Therefore, measurement items were considered suitable for carrying out factor analysis.

Hairet et al. (1992) thought that it is significant when the sample size is bigger than or is equal to 50, and load factor is bigger than 0.30. In order to ensure factors' significance, the research took 0.5 as lowest critical value of load factor. We made three subscales (personal feature, internal mechanism and support framework) play factor analysis. From the results of factor analysis, observed variables of each subscales accorded with the requirement of statistics, it was proved that structure validity of each subscales was good.

3) *Structural equation modeling*

The test of the model was carried out using SEM, a confirmatory factor analysis that tests a model and its validity simultaneously. Amos 7.0 was used to perform the SEM analysis.

TABLE V. OVERALL MODEL FIT INDEXES

Fit index	Ideal standard value	Acceptable standard value	Scores
χ^2	N/A	N/A	1509.126
df	N/A	N/A	959
χ^2/df	≤ 2.00	≤ 3.00	1.574
GFI	≥ 0.90	≥ 0.80	0.759
RMR	≤ 0.05	≤ 0.08	0.062
RMSEA	≤ 0.05	≤ 0.08	0.053
AGFI	≥ 0.80	≥ 0.70	0.729
NFI	≥ 0.90	≥ 0.80	0.676
CFI	≥ 0.90	≥ 0.80	0.848

TABLE VI. SUMMARY RESULTS OF HYPOTHESIS TEST ABOUT THE RESEARCH MODEL

Hypothesis	Path	Description	Results
H1	AT-IN	Altruism → Intention to share tacit knowledge	Not supported
H2	NS-IN	Need satisfaction → Intention to share tacit knowledge	Supported
H3	SH-IN	Sense of honor → Intention to share tacit knowledge	Supported
H4	TC-IN	Team cohesion → Intention to share tacit knowledge	Not supported
H5	IT-IN	Interpersonal trust → Intention to share tacit knowledge.	Supported
H6	AL-IN	Authorized leadership → Intention to share tacit knowledge	Not supported
H7	SE-IN	Self-efficacy → Intention to share tacit knowledge	Supported
H8	RA-IN	Resources adequacy → Intention to share tacit knowledge	Supported
H9	HE-IN	Heterogeneity → Intention to share tacit knowledge (negative)	Supported
H10	HE-IT	Heterogeneity → Interpersonal trust (negative)	Not supported
H11	IT-SE	Interpersonal trust → Self-efficacy	Supported
H12	SE-TC	Self-efficacy → Team cohesion	Supported
H13	AT-RA	Altruism → Resources adequacy	Supported
H14	AL-AT	Authorized leadership → Altruism	Supported

Table V shows the overall fit indexes of our model. It shows that our model resulted in good results at the χ^2/df , RMR, AGFI, CFI, and marginal fitness levels for the indexes of PGFI, and PNFI. We concluded that the overall model fit indexes had reached an acceptable level.

And then we analyzed the path coefficient of model by using SEM. Figure 4 depicts the final results about the path coefficient of the research model. Table VI shows the results of hypothesis test.

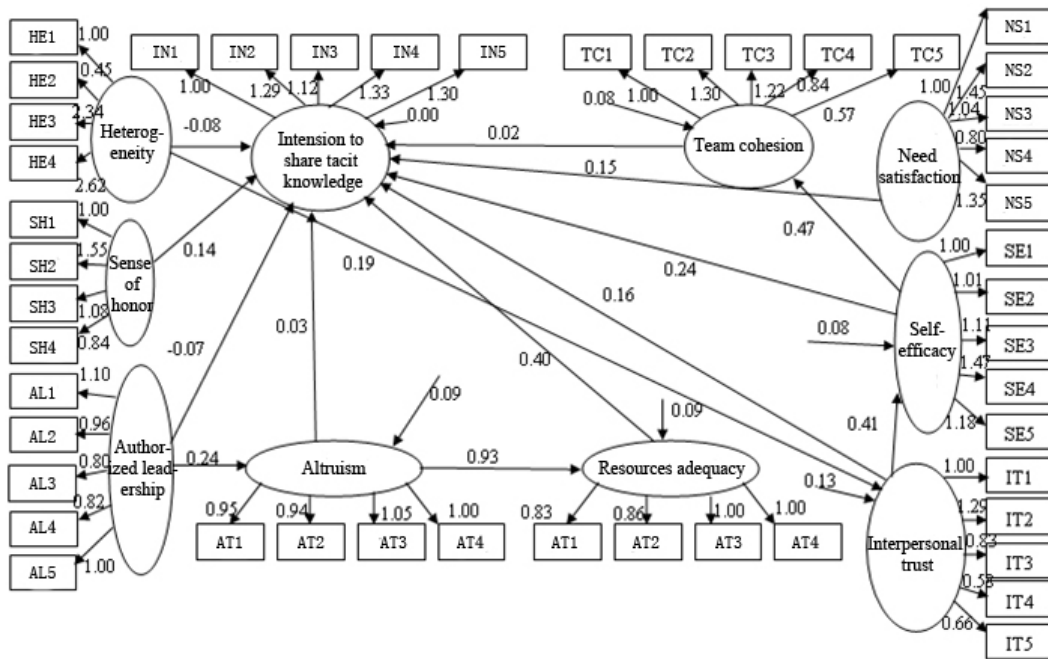


Figure 4. The path coefficient of the research model

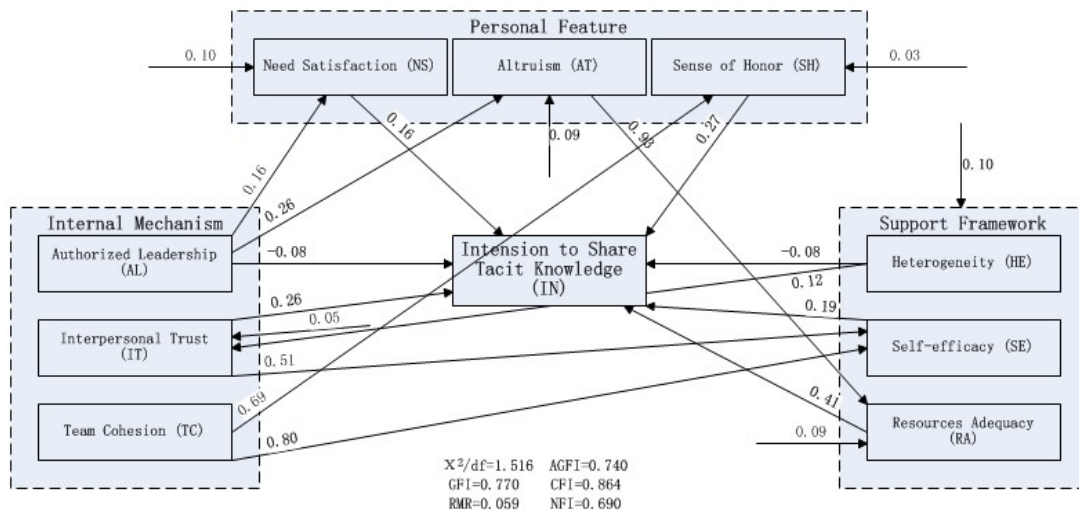


Figure 5. The path coefficient of the revised model

4) Model revise

In order to understand the causality and act path of variables in depth, according to adjustment suggestion of amos7.0 and combining with related literature, we revised research model and hypotheses, and rebuilt the model of influencing factors of the intention to share tacit knowledge in the university research team. Figure 5 shows the path coefficient of the revised model.

The indexes (such as GFI, RMR, AGFI, NFI, CFI, and so on) of the revised model were better than original model, which showed that the revised model had good overall model fit indexes.

In the condition of good model fit indexes, we recalculated the causality, act path, and homologous path coefficient among variables. The causal effect between variables mainly contains direct effect and indirect effect (Hou Taijie et al., 2004). Direct effect is that only causal variable (endogenous variable) has direct impact on the outcome variable (exogenous variable). Indirect effect is

that causal variable has an indirect impact on the outcome variable by influencing one or more mediator variables. When there is only one mediator variable, the value of indirect effect is equal to the arithmetic product of two path coefficients. Table VII summarizes the total influencing effects among variables about the revised model, and it reflected the relationship between variables. From Table VII, we can find, in the university research team, personal feature (need satisfaction, sense of honor, altruism), internal mechanism (interpersonal trust, team cohesion, authorized leadership), and support framework (resources adequacy, self-efficacy) significantly contributed to the intention to share tacit knowledge, however, heterogeneity significantly had a negative effect on the intention to share tacit knowledge.

IV. DISCUSSIONS AND IMPLICATIONS

Based on the above the results of empirical study, we provided some useful strategies and suggestions to

TABLE VII. TOTAL INFLUENCING EFFECTS AMONG VARIABLES ABOUT THE REVISED MODEL

DV ^a \ IV ^b	IN	SH	NS	AT	RA	SE	TC	IT
SH	0.27	--	--	--	--	--	--	--
NS	0.16	--	--	--	--	--	--	--
AT	0.38*	--	--	--	0.93	--	--	--
HE	-0.05*	--	--	--	--	--	--	0.12
RA	0.41	--	--	--	--	--	--	--
SE	0.19	--	--	--	--	--	--	--
TC	0.34*	0.69	--	--	--	0.80	--	--
IT	0.36*	--	--	--	--	0.51	--	--
AL	0.05*	--	0.16	0.26	--	--	--	--

a Dependent variables. b Independent variables

*The number contains indirect effect

enhance the intention to share tacit knowledge of university research team for university managers and team leaders from the aspects of personal feature, internal mechanism and support framework.

A. Improving strategies of the intention to share tacit knowledge based on the personal feature

1) Satisfy the needs of the university research team

Empirical study indicated needs satisfaction has a direct and positive effect on the intention to share tacit knowledge. For master and Ph.D., physiology and safety needs are their most urgent needs. For professor and asocial professor, their needs focus on the higher levels, like belongingness, self-respect, self-realization, etc. Therefore, for students, the leader of university research team should first adopt effective incentive mechanism to help them to solve the issues of lives, and then satisfy members' needs in the aspects of respect, self-realization, etc. For teachers, except salary and bonus, research team should meet their needs of belongingness, self-respect, and self-realization. In this way, the intention to share tacit knowledge can be improved.

2) Encourage altruism of the university research team

Empirical study showed altruism has a direct and positive effect on the intention to share tacit knowledge, so altruistic behavior should be encouraged in the university research team. Firstly, research team should permeate altruism into everyone's work and life by propagandizing altruism extensively. Secondly, research team should build intensive mechanism and give altruist material or spiritual reward to encourage this behavior. To support and motivate altruism would promote members to exchange research experience.

3) Strengthen members' sense of honor in the university research team

Empirical study indicated that sense of honor has a direct and positive effect on the intention to share tacit knowledge. The members who own team's sense of honor and consider team goal as the direction of life would be willing to help others and have high intention to share tacit knowledge. To strengthen the members' sense of honor, firstly, build a harmonious interpersonal relationship for team. Secondly, cultivate team members' sense of pride; moreover, cultivate members' responsibility and sense of mission about research work.

Through these measures, members will consider team' honor as their honor, and then improve the intention to share tacit knowledge with others for team's honor.

B. Improvement strategies of the intention to share tacit knowledge based on the internal mechanism

1) Build a trust climate in the university research team

Empirical study revealed interpersonal trust has a direct and positive effect on the intention to share tacit knowledge. High trust climate is a crucial precondition of knowledge dissemination. To build a trust climate in the university, firstly, research team should advocate open, uncontrolled and innovative scholarship culture^[16]. Secondly, encourage members communicate with each other formally or informally, promote mutual understanding and then enhance mutual trust; moreover, establish common vision to strengthen members' trust. These measures will strengthen the members' intention to share tacit knowledge.

2) Reinforce team cohesion of the university research

Empirical study indicated team cohesion has a direct and positive effect on the intention to share tacit knowledge. Cohesion is the basis of forming research team's creativity and competitiveness. To improve cohesion of the university research team, first, guarantee the frontier research fields and make members know their work meaning and work value. Second, concern about members' life and study, which can enhance team's centripetal force^[17]. Third, create a harmonic relationship among members to reinforce team cohesion.

3) Apply appropriate leadership style in the university research team

A lot of scholars believed that, a leadership style which is appropriate for any organizations and conditions does not exist. For the different lifecycle in the university research team, team leader should adopt different leadership style to adapt the environmental change. For example, adopt imperative leadership style in the formative period of university research team, while adopt authorized leadership style in the harvested period^[18].

C. Improvement strategies of the intention to share tacit knowledge based on the support framework

1) Reduce members' heterogeneity in the university research team

Empirical study indicated that, the members who have great difference in the three aspects of age, professional knowledge and values, owned weak intention to share tacit knowledge. So we should reduce the members' difference from the three facets. Firstly, keep members' age balanced and make the best use of every member when setting up university research team^[19]. Secondly, select those members who own same or similar professional background as much as possible. The last but not the least, weaken members' heterogeneity by strengthen members' communication.

2) Enhance members' self-efficacy in the university research team

To enhance members' self-efficacy, firstly, team leader should often encourage members and give members who get achievements praise in time to strengthen members'

self-confidence. Secondly, team should set examples for outstanding members, which can make the other members wake up to that paying out effort can obtain success. Moreover, build a close relationship in the team and make team members do positive evaluation with each other, which can reinforce members' self-efficacy.

3) Provide adequate resources for members' communication in the university research team

Adequate basic material resource (such as time, space, technical support, etc) is the basis of transferring and sharing scientific research experience. For instance, holding various exchanging and recreational activities, provide enough discussion room for members, and building an internet communication platform. In addition, encourage aggressively and appraise correctly members' knowledge sharing behavior, and then construct a favorable knowledge sharing climate. All of these can supply necessary basic resource for team members' knowledge sharing.

V. CONCLUSION AND LIMITATIONS

Our study was one of the first to provide empirical study about the intention to share tacit knowledge in the university research team systematically and fully. It offers insights to team leaders on the values why members are or are not willing to engage in tacit knowledge sharing within the university research team.

We also found that, personal feature (need satisfaction, sense of honor, altruism), internal mechanism (interpersonal trust, team cohesion, authorized leadership), and support framework (resources adequacy, self-efficacy) significantly contributed to the intention to share tacit knowledge, however, heterogeneity significantly had a negative effect on the intention to share tacit knowledge.

This study has a few inherent limitations. First, on the basis of the simplification of research issues and focusing on the key factors, we hypothesized only nine factors in our model; other factors (such as team goals, familiarity degree, outcome expectations, etc) may also affect outcomes. Second, the university research team had its lifecycle, but we did not distinguish the different cycles (like formation period, development period, maturation period, and harvest period) in our study. Moreover, the data collection was limited to some universities from Chinese mainland.

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REFERENCES

- [1] Hu Zeping, Shi Qinfen. An analysis of intension and flow of research teams in universities [J]. Science & Technology Progress and Policy, 2006, 23(11): 111-115.
- [2] Wang Lili, Liu Jingran. The barriers and strategies of knowledge sharing within university research team [J]. Forward Position, 2007, 12: 122-125.
- [3] Yang Zhenhua, Shi Qinfeng. An analysis of scale and communication network in the university research team [J].

Science & Technology Progress and Policy, 2008, 25(4): 190-193.

- [4] Fishhein M, Ajzen. Belief, Attitude, Intention and Behavior: an Introduction to Theory and Research [M]. Massachusetts: Addison Wesley, 1975: 15-56.
- [5] Armitage C J, Conner M. Efficacy of the Theory of Planned Behavior: A Meta-analytic Review [J]. British Journal of Social Psychology, 2001, 40: 471-499.
- [6] Swee C. Goh. Managing effective knowledge transfer: an integrative frame work and some practice implications. Journal of Knowledge Management, 2002, 6(1): 23-30.
- [7] An analysis of structure and transforming factors of tacit knowledge of teachers in universities [J]. Science of Science and Management of S. & T., 2006, 3:80-84.
- [8] Zhou Mi, Zhao Xiping, Yao Fang. Establishing the Trust Relationship between Employees Based On Knowledge-Sharing Willingness [J]. Science of Science and Management of S. & T., 2006, 27(1):112-116.
- [9] Shan Xuehan. A study on the influencing factors and achieved countermeasures of knowledge sharing [D]. Hangzhou: Zhejiang University, 2003.
- [10] Lu Changqing, Lin Wenquan, Fang Liluo. Effects of Managerial Self-Efficacy on Managers Wrok-Related Attitudes and Performances: An Exploratory Study in China [J]. Journal of Peking University (Natural Science Edition), 2006, 42(2): 276-280.
- [11] Wu Jisong, Lu Guoping. On the dialectical and systematic concept of resources [J]. China population, resources and environment, 1977, 45(4): 871-880.
- [12] Blau J H, Deb R. Social Decision Functions and the Veto [J]. Econometrica, 1977, 45(4): 871-880
- [13] Shi Wendian, Luo Zhao, Yuan Xianxue. The Influence of Self-efficacy of Members of Practice Communities on Knowledge Transmission Process and Effect [J]. Psychological Science, 2007, 30(1): 92-95
- [14] Minglong Wu. SPSS statistical application of practice [M]. Beijing: Phraseology Press, 2003.
- [15] Li Bozhou. An analysis of altruistic behavior in current Chinese society [J]. Academic Exchange, 2008, 01: 32-35.
- [16] Tan Xiaojin. An application of Maslow's hierarchy theory of needs in the management of teachers [J]. Forum on contemporary education, 2008, 10: 94-95.
- [17] Yang Sibao, Hou Peiyong, Lin Na. The main influencing factors of cohesion [J]. Journal of Northwestern Polytechnical University (Social Science Edition), 2001, 21(2): 57-58.
- [18] Hou Guangming, Jin Linlin. Study on the Leadership of Innovative Research Team in Research Universities [J]. Science & Technology Progress and Policy, 2006, 23(10) :178-181
- [19] Liu Huiqing. The Effects of Team Heterogeneity, Size, Stages and Type on Academic Team s Innovation Performance [J]. Tsinghua Journal of Education, 2008, 29(4):83-91

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