

WE-INTENTION TO USE INSTANT MESSAGING FOR COLLABORATIVE WORK: THE MODERATING EFFECT OF EXPERIENCE

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Abstract: In response to an increase in both team collaboration and real-time dynamics in the current business environment, more and more companies adopt instant messaging as a means of improving team effectiveness and efficacy and reducing delays in decision making. This study offers a novel exploration of co-workers' we-intention to use instant messaging for collaborative work by investigating two group-level determinants – group norm and social identity – and considering the mediating effect of desire. A survey (n=482) was conducted to test the differences between high and low experience respondents. The research model explains 57.5% of the variance in we-intention. Research results show that desire partially mediates the effects of group norm and social identity on we-intention. The relationships between group norm and desire, as well as between group norm and we-intention, are found to be stronger for low experience group, in contrast, the relationships between social identity and desire, as well as between social identity and we-intention, are found to be stronger for high experience group. Implications of this study are provided for both researchers and practitioners.

1 INTRODUCTION

In the past two decades of Information Systems (IS) research, studies on technology adoption and use primarily focused on individual intention (I-intention), implying a personal intention to adopt a new technology. Several aspects (i.e., perceived usefulness, perceived ease of use, attitude, subjective norm, etc.) are studied as important antecedents of users' individual intention (Venkatesh et al., 2003).

Although prior intention-based studies have contributed to understanding users' technology usage behavior, some critical gaps remain.

First, the traditional concept of individual intention (I-intention) has been proven successful in explaining technology usage behavior (Venkatesh et al., 2003), however, it is not appropriate to explain social act, such as collective use of collaborative business systems. In this regard, "we-intention", implying an implicit or explicit agreement between the participants to engage in a joint action (Tuomela,

1995), is an applicable but relatively unexplored issue in the IS discipline.

Second, prior studies defined social influence as the degree to which an individual perceives that significant others think he or she should use the new systems and found that social influence constructs are only significant in mandatory contexts (Venkatesh et al., 2003). Gaps in our understanding of voluntary systems usage behavior appeal for more attention on social influence from other alternative perspectives (Malhotra & Galletta, 2005).

Third, some criticism have pointed out that attitude, subjective norm, and other commonly specified direct determinants of intention provide reasons for acting but do not incorporate the motivational content needed to induce an intention to do so (Bagozzi, 1992). Thus, it is important to incorporate motivational variables, such as desire, into intention-based model to explain how decisions about the use of information technology become stimulated and energized.

This study attempts to fill these gaps in the literature by proposing and testing a social influence model on the use of instant messaging for work-related activities. As one of the fastest growing Internet-based collaborative technologies, instant messaging has been widely used in the workplace. A recent survey showed that 35% of employees are now using instant messaging at work (American Management Association & The ePolicy Institute, 2006). Additionally, it is predicted that almost 99% of organizations in North America will employ instant messaging as one of their basic collaborative systems by 2009 (Osterman Research, 2006). Based on these insights, it is very important to understand why co-workers adopt and use instant messaging for collaborative work.

The objective of this study is to investigate users' we-intention to use instant messaging in task-oriented groups. Drawing from philosophical writing on collective intentionality and Kelman's (1974) social influence framework, the proposed model investigates the roles of two important social influence processes – internalization and identification – in affecting we-intention to use instant messaging for collaborative work, and further examines the mediating effect of desire and the moderating effect of users' experience. In the next section, the theoretical background of the study is presented. The research model and its corresponding research hypotheses are provided in section 3. The research method and the results are reported in sections 4 and 5 respectively. This paper concludes with the implications for theory and practice.

2 THEORETICAL BACKGROUND

The theoretical foundation for the present study is reviewed in this section. Specifically, the concept of we-intention, desire, social influence framework and usage experience are discussed.

2.1 We-Intention

We-intention can be considered as the intention to participate in a group to perform a group behavior in which the participants perceive themselves as members of the group (Bagozzi, 2000). Different from the I-intention to perform an individual act where other persons are not involved as essential parts of the behavior, we-intention highlights the individual commitment in collectivity and the social nature of a group action. With a we-intention to perform a group act, an individual views a group activity holistically, in such a way that he or she sees himself or herself as part of a social representation, and it is the group that acts or experiences an event.

In the past two decades of IS research, intention-based models have been dominated by the I-intention approach to predict IS acceptance and usage behavior (Ajzen, 1985; Davis, 1989; Fishbein & Ajzen, 1975). However, the traditional I-intention approach fails to capture the collective nature involved in information technology acceptance and usage, especially the use of collaborative systems. In this sense, "we-intention" appears more appropriate in studying the issues concerning group acceptance behavior in IS research.

2.2 Desire

Desire represents a motivational state needed to induce an intention to act and transforms the reasons for acting into a motivation to do so (Perugini & Conner, 2000). Bagozzi (1992) proposed that desire mediates the effects of attitude to act, subjective norm and perceived behavioral control on intention. In the IS domain, previous research studies also have adopted motivational theory to understand technology adoption and usage behavior (e.g., Davis et al., 1992; Venkatesh & Speier, 1999). They found that the both extrinsic and intrinsic motivations are consistently significant in predicting behavioral intention across time and in both mandatory and voluntary contexts (Venkatesh et al., 2003).

2.3 Social Influence Framework

Davis et al. (1989) emphasized the role of social influences in information technology acceptance and usage behavior and suggested that Kelman's (1974) theoretical distinction of social influence processes can be considered as a theoretical base for developing knowledge in this area. Kelman (1974) distinguished three different processes of social influences, including compliance, identification, and internalization. Compliance occurs when an individual accepts the influence to get support or approval from significant others. It is usually represented through the effect of subjective norm. Identification occurs when an individual accepts the influence to establish and maintain a self-defining relationship to another person or group. Internalization occurs when an individual accepts the influence because the similarity of one's goals and values with that of other group members.

Prior IS research concentrated primarily on the influence of social normative compliance (Davis et al., 1989; Venkatesh et al., 2003) and found that the effect of social influence is only significant under conditions of mandatory use and with limited experience (Venkatesh et al., 2003). Not until recently, IS researchers started to investigate affective commitment – that is, internalization and identification based on personal norms – in volitional systems adoption and usage behavior (Malhotra & Galletta, 2005).

2.4 Usage Experience

Experience is the knowledge and skills regarding an object or an event obtained from the involvement or the exposure to that object or event. There is a board range of research studying the moderating effect of usage experience in information technology acceptance and usage behavior (Thompson et al., 1994; Venkatesh & Davis, 2000; Venkatesh et al., 2003). For example, Thompson et al. (1994) examined the direct, indirect and moderating effects of experience on the relationships between the attitude/belief components and utilization and found that the moderating influence of experience was generally quite strong. Furthermore, Venkatesh and Davis (2000) recently found that the effect of compliance and internalization attenuated with increased experience.

3 RESEARCH MODEL AND HYPOTHESES

A social influence model, as shown in Figure 1, is proposed. The constructs and their relationships are discussed in this section.

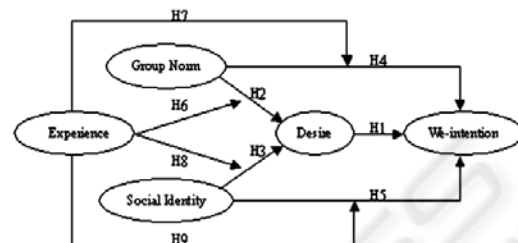


Figure 1: The research model.

3.1 The Mediating Effect of Desire on the Relationships between Social Influences and We-Intention

According to previous works (Bagozzi, 1992; Bagozzi & Dholakia, 2002; Dholakia et al., 2004; Perugini & Bagozzi, 2001; Perugini & Conner, 2000), desire transforms the reasons to act into an overall motivation to do so and is hypothesized as the most proximal determinants of intention. Following the same vein, once a person is aware of and accepts his or her desire to use instant messaging for collaborative work, this will motivate him or her to form a we-intention to act. Therefore,

H1: Desire has a positive impact on we-intention to use instant messaging for collaborative work.

Considering the voluntary use of instant messaging for collaborative work, compliance has not been included in our research model. Instead, internalization and identification stemmed from Kelman's (1974) social influence framework are regarded as two important determinants of instant messaging usage behavior. Such a two-factor view of social influence is also consistent with prior studies (e.g., Dholakia et al., 2004).

Internalization is represented in this study through the effect of group norm (Bagozzi & Lee, 2002). The social influence underlying group norm is captured by the congruence of one's values and goals with that of other group members. In the current study, people who are willing to use instant messaging for collaboration share a common task. In this regard, group norm provides the potential for using instant messaging to collaborate with others, however, it does not include the motivation to do so. In accordance with previous works (Bagozzi, 1992;

Perugini & Conner, 2000), the transformation of group norm into we-intention to use instant messaging for collaborative work is believed to be provided by users' desire to use. Based on the discussion above, it is anticipated that desire mediates the effect of group norm on we-intention.

H2: Group norm has a positive impact on desire to use instant messaging for collaborative work.

Identification is characterized by social identity in this study, which refers to one's conception of self in terms of the relationship with a focal group (Bagozzi & Lee, 2002). Instant messaging provides an easy and direct manner for group members to establish or maintain a satisfying relationship with another person or group. For example, the presence awareness feature of instant messaging promotes a sense of connectiveness among group members and increases the attachment with the group. In this regard, social identity, mediated by desire in the same way as group norm, impacts users' we-intention to use instant messaging (Bagozzi & Dholakia, 2002; Dholakia et al., 2004). Thus,

H3: Social identity has a positive impact on desire to use instant messaging for collaborative work.

3.2 The Direct Effects of Social Influences on We-Intention

Although desire mediates the effects of social influences on we-intention to use instant messaging for collaborative work, the mediating effects are partial. This is because the formation of we-intention involves both deliberative and evocative mental processes (Dulany, 1997). Deliberative mental processes refer to the thinking processes involving reflection and evaluation. This process is consistent to Frankfurt's (1988) proposition that decision makers give self-reflective consideration to their desire and accept it as motivating reasons to act. In contrast, evocative mental processes are those that automatically and directly associate and activate mental states. To meet other group members with congruent values and to maintain satisfying relationships with them, users may form a we-intention to use instant messaging for collaborative work automatically. Under the evocative mental processes, group norm and social identity exhibit direct impacts on we-intention. Therefore,

H4: Group norm has a positive impact on we-intention to use instant messaging for collaborative work.

H5: Social identity has a positive impact on we-intention to use instant messaging for collaborative work.

3.3 The Moderating Effect of Experience

The moderating effect of experience has been investigated in a wide range of behaviors (Davis et al., 1989; Thompson et al., 1994; Venkatesh et al., 2003; Venkatesh & Davis, 2000). These studies found that social normative compliance became less important with increasing experience. Extending this line of research, the moderating effects of experience in internalization and identification processes are investigated in the current study.

Prior to or at the beginning of the use of instant messaging for collaboration, users' knowledge and beliefs about instant messaging are vague. They may rely more on the opinions of others – here, the group members with congruent values and goals – as a basis of their usage behavior. After a period of use, their direct experience furnish concrete information about the use of instant messaging for collaborative work, supplanting reliance on social cues as a basis of decision. Thus, the influence of group norm attenuates after users possess direct experience on the strengths and weakness of instant messaging. Based on the discussion above,

H6: The positive impact of group norm on desire to use instant messaging for collaborative work is stronger for low experience users than for high experience users.

H7: The positive impact of group norm on we-intention to use instant messaging for collaborative work is stronger for low experience users than for high experience users.

With increased experience, users of instant messaging may have closer and stable relationships with other group members than novice. The high experience users also have a strong attachment and belongingness toward the focal group. In addition, after a long term of using instant messaging for collaboration, the value connotation attached to this group membership is more apparent. A deep awareness of membership in the collaborative group and a sustained satisfying relationship with other group members stimulate members' use of instant messaging for collaborative work. Therefore,

H8: The positive impact of social identity on desire to use instant messaging for collaborative work is stronger for high experience users than for low experience users.

H9: The positive impact of social identity on we-intention to use instant messaging for collaborative work is stronger for high experience users than for low experience users.

4 RESEARCH METHOD

To mitigate the coverage errors or other biases resulting from data collection method, data was collected using both pen-and-paper survey and an online survey. Participation in this study was voluntary yet motivated by a lucky draw among successful respondents. All the measures had been validated in prior studies (see Table 1). Minor changes in the wordings were made so as to fit them into the current investigation context of instant messaging. Experience was measured by a single ordinal scale question that assessed the frequency of using instant messaging for collaborative work in the previous year (from 1=never to 7=always). In addition, a screening question was employed to identify respondents who use instant messaging for collaborative work. Backward translation was used to ensure consistency between the Chinese and the original English version of the questionnaire. For the pen-and-paper survey, a group of business students in a local university in mainland China were invited

to participate in. A total of 301 usable questionnaires were collected in this phase and a total of 181 usable questionnaires were collected through online survey. Analysis of the two samples revealed no significant difference in the composition of users. Among the overall respondents, 35.1% were female and 64.9% were male. Most of them were aged between 21 and 25 (58.9%). The average time spent on instant messaging everyday reaches 3.43 hours.

5 RESULTS

Partial Least Squares (PLS) was used to test the proposed research model. The PLS procedure (Wold, 1989) is a second-generation multivariate technique which has the ability to model latent constructs under conditions of non-normality. Following the two-step analytical procedures (Hair et al., 1998), the measurement model was examined and then the structural model was assessed.

Table 1: Summary of psychometric properties of the measures.

Construct	List of items	Loading	Source
Group Norm (GN) $\alpha=0.898$ $\beta=0.814$	Using instant messaging for collaboration sometime within the next 2 weeks can be considered to be a goal. For each of the members in your group, please estimate the strength to which each holds the goal. (seven-point "weak-strong" scale) GN1: Strength of self's goal. GN2: Average of the strength of group members' goal.	0.908 0.897	Bagozzi & Lee, 2002
Social Identity (SI) $\alpha=0.908$ $\beta=0.623$	SI1: How would you express the degree of overlapping between your own personal identity and the identity of the group you collaborate with through instant messaging when you are actually part of the group and engaging in group activities? (eight-point "far apart-complete overlap" scale) SI2: Please indicate to what degree your self-image overlaps with the identity of the group of partners as you perceive it. (seven-point "not at all-very much" scale) SI3: How attached are you to the group you collaborate with through instant messaging? (seven-point "not at all-very much" scale) SI4: How strong would you say your feelings of belongingness are toward the group? (seven-point "not at all-very much" scale) SI5: I am a valuable member of the group. (seven-point "does not describe me at all-describes me very well" scale) SI6: I am an important member of the group. (seven-point "does not describe me at all-describes me very well" scale)	0.657 0.789 0.831 0.839 0.797 0.810	Bagozzi & Lee, 2002
Desire (DE) $\alpha=0.916$ $\beta=0.785$	DE1. I desire to use instant messaging for collaboration during the next 2 weeks. (seven-point "disagree-agree" scale) DE2. My desire for using instant messaging for collaboration during the next 2 weeks can be described as: (seven-point "no desire at all- very strong desire" scale) DE3. I want to use instant messaging for collaboration during the next 2 weeks. (seven-point "does not describe me at all-describe me very well" scale)	0.865 0.901 0.891	Bagozzi & Dholakia, 2002
We-Intention (WE) $\alpha=0.905$ $\beta=0.827$	WE1: I intend that our group use instant messaging for collaboration together sometime during the next two weeks. (seven-point "disagree-agree" scale) WE2: We intend to use instant messaging for collaboration together sometime during the next two weeks. (seven-point "disagree-agree" scale)	0.918 0.900	Bagozzi & Lee, 2002

Note: α = composite reliability; β = average variance extracted.

5.1 Measurement Model

Convergent validity was assessed by examining composite reliability and average variance extracted (Hair et al., 1998). A composite reliability of 0.70 or above and an average variance extracted of more than 0.50 are deemed acceptable (Fornell & Larcker, 1981). As shown in Table 1, all the measures exceed the recommended thresholds.

Discriminant validity indicates the extent to which a given construct differs from other constructs. To demonstrate the adequate discriminant validity of the constructs, the square root of the average variance extracted for each construct should be greater than the correlations between that construct and all other constructs (Fornell & Larcker, 1981). As shown in Table 2, each measure has an adequate level of discriminant validity.

Table 2: Correlation matrix of the constructs.

	GN	SI	DE	WE
GN	0.902			
SI	0.488	0.789		
DE	0.415	0.556	0.886	
WE	0.443	0.524	0.738	0.909

Note:

GN=group norm, SI=social identity, DE=desire, WE=we-intention

*The shaded numbers in the diagonal row are square roots of average variance extracted.

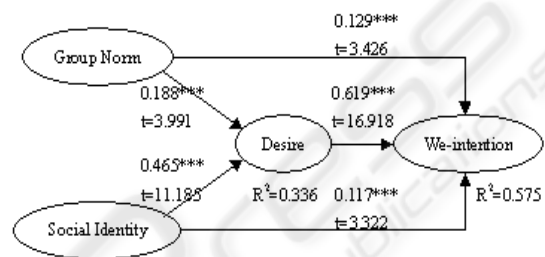
5.2 Structural Model

The hypotheses of the research model were tested with three structural equation path models. The first model tested H1-H5 with the full sample (n=482). The other two models tested H6-H9, the moderating effect of experience. The full sample was divided into two groups based on the mean value of experience (Mean=4.89). Thus, values from 1 to 4 are categorized as low experience (n=188) and values from 5 to 7 as high experience (n=294).

5.2.1 The Roles of Group Norm, Social Identity and Desire in We-Intention Formation

The results pertaining to H1-H5 are depicted in Figure 2, which presents the overall explanatory power, estimated path coefficients, and associated t-value of the paths. Test of significance of all paths were performed using the bootstrap resampling procedure. All structural paths are found statistically significant at the 0.001 level. The results show that

group norm, social identity and desire together explain 57.5% of the variance in we-intention to use instant messaging for collaborative work. Desire has the strongest impact on we-intention, with a path coefficient at 0.619, followed by group norm and social identity, with path coefficients at 0.129 and 0.117 respectively. Desire partially mediates the effects of group norm and social identity on we-intention. Up to 33.6% of the variance in desire is explained. Social identity has a stronger impact on desire, with a path coefficient at 0.465, than group norm, with a path coefficient at 0.188.

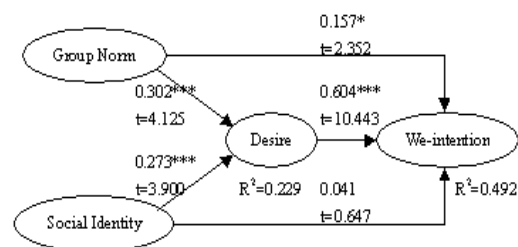


Notes: *p<0.05, **p<0.01, ***p<0.001

Figure 2: Results of research model with full sample.

5.2.2 The Moderating Effect of Experience

As shown in Figure 3, the structural model for low experience group explains 49.2% of the variance in we-intention to use instant messaging for collaborative work and 22.9% of the variance in desire. Desire exhibits the strongest impact on we-intention, with a path coefficient at 0.604, followed by group norm, with a path coefficient at 0.157. However, social identity does not significantly impact on we-intention. Both group norm and social identity posit significant effects on desire, with path coefficients at 0.302 and 0.273 respectively.

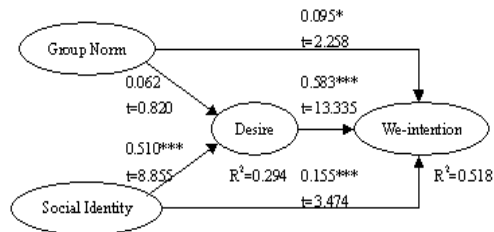


Notes: *p<0.05, **p<0.01, ***p<0.001

Figure 3: Structural model for the low experience group.

Figure 4 shows the results of the structural model for the high experience group. The model explains 51.8% of the variance in we-intention and 29.4% of the variance in desire. Desire posits the strongest impact on we-intention, with a path coefficient at

0.583, followed by social identity and group norm, with path coefficients at 0.155 and 0.095. Social identity has a significant impact on desire, with a path coefficient at 0.510, whereas the relationship between group norm and desire is nonsignificant.



Notes: *p<0.05, **p<0.01, ***p<0.001

Figure 4: Structural model for the high experience group.

Table 3: Path comparisons between the low experience group and the high experience group.

Path for Comparison	Path Coefficients		Result
	Low Experience Group	High Experience Group	
Group Norm → Desire	0.302***	0.062	H6 is supported
Group Norm → We-intention	0.157*	0.095*	H7 is supported
Social Identity → Desire	0.273***	0.510***	H8 is supported
Social Identity → We-intention	0.041	0.155***	H9 is supported

Note: *p<0.05, **p<0.01, ***p<0.001

Table 3 summarizes the comparisons of the path coefficients between the high and the low experience groups. The results show that the influences of group norm on desire and on we-intention to use instant messaging for collaborative work were stronger for low experience users, providing support to H6 and H7. In contrast, the influences of social identity on desire and on we-intention were stronger for high experience users, providing support to H8 and H9.

6 DISCUSSION

This research investigated both direct and indirect effects of internalization and identification processes on “we-intention” to use instant messaging for collaborative work. This study also found that there are significant differences between low and high experience users in terms of social influence acceptance. Implications of this study are noteworthy for both researchers and practitioners.

6.1 Implications for Researchers

This study is one of the first few attempts to investigate “we-intention” in the acceptance and use of collaborative technologies, in particular, instant messaging in the current study. As mentioned before, this study intends to fill several critical gaps in the literature. First, the “we-intention” concept is introduced into IS adoption and diffusion research. Different from the traditional individual intention, “we-intention” reflects the intention to accept and use a particular information technology in concert with other group members. In view of the group notion involved, this concept is especially important for collaborative business systems research. Second, results of this study indicate that both internalization and identification processes play important roles in voluntary systems usage behavior. Third, this study also investigates the mediating effect of desire on the relationship between social influence and we-intention. The results demonstrated that desire has the strongest impact on we-intention and partially mediate the effects of reasoned antecedents on we-intention. Fourth, another interesting finding of the present study reveals that experience, on the one hand, weakens the relationship between group norm and desire, as well as the relationship between group norm and we-intention to use instant messaging for collaborative work. On the other hand, experience strengthens the relationship between social identity and desire, as well as the relationship between social identity and we-intention.

6.2 Implications for Practitioners

This issue is practically important as well because the use of instant messaging in the workplace continues to grow at a steady space. According to the findings of this study, both group norm and social identity play important roles in determining we-intention to accept and use instant messaging for collaborative work. Therefore, practitioners should encourage users to make good use of some special features of instant messaging, like user profile, chat room and presence awareness, to promote the group values and norms to all members and enhance the awareness of group membership. Experience also has been identified as a potential moderator of social influence acceptance. Practitioners should wisely differentiate between the two groups. For low experience users, group norm is more important. Special features of instant messaging, like user profile and conversation history, will help to convey values and goals of the collaborative group to the

newcomers. In contrast, social identity plays a more important role for high experience group. In this regard, features, such as chat room and presence awareness, will help to establish and maintain good relationships among all group members.

In summary, this study provides new insights in understanding the effects of internalization and identification processes on desire and we-intention. This study also investigates the moderating effect of experience. Future research should continue to enrich this line of research by extending the investigation in other collaborative business systems, especially social computing technologies.

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