

Research article

# Gender differences in intentional social action: we-intention to engage in social network-facilitated team collaboration

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## Abstract

The growth and popularity of Web 2.0 applications help people to build and maintain their social networks online and further encourage social network-facilitated team collaboration. In this study, we conceptualized the use of instant messaging in social network-facilitated team collaboration as an intentional social action and further investigated the effect of gender differences in the development of we-intention (i.e. collective intention) to engage in such collaboration. A research model was developed and empirically tested with 482 university students in Mainland China. The results demonstrated that the effects of attitude, positive anticipated emotions, and group norms on we-intention were more important for men, whereas the effects of social identity and negative anticipated emotions were more significant for women to collectively participate in social network-facilitated team collaboration. We believe the implications of this study would shed considerable light on both research and practice.

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## Introduction

Today, there are more than 1 billion individuals around the world connected and networked together through Internet to communicate, collaborate, and contribute their knowledge and wisdom (Arena and Benjamin, 2009). In recent years, the growth and popularity of Web 2.0 applications have greatly facilitated the development of online social networks for individuals with common interests to communicate and work together. In fact, social networking in itself is a collective effort by more than one person to create something together. Nowadays, social networks connect people not only in their private time but also for work-related issues. It offers new opportunities for communication and collaboration among team members. Some business initiatives have started to employ social networking tools for effective team collaboration in a workplace context. For example, OwnerServer.com provides a collaborative platform for people to schedule events,

create voting survey, share documents, and be more productive in a deeply connected environment. These features have also appeared in public social networking websites, such as Facebook and MySpace, and communication technologies, such as instant messaging (IM) and weblogs, which support the development of online social networks. Recent studies indicate that IM has now become an important and integral part of everyday life (e.g. Lenhart *et al.*, 2007). The number of IM users was expected to grow from 432 million in 2006 to 650 million in 2010 (Radicati Group Inc, 2006). Some people use IM to expand and maintain their professional and social circles, and more people are beginning to use IM at work with other employees in their organizational networks to discuss task-related issues and share calendars or documents.

Despite the importance and great potential of IM in supporting networking and collaboration, its value will

never be realized if people are not willing to use IM together with others in their social networks. Different from other common personal productivity tools (such as word processing), the adoption and use of IM, in some sense, is basically a collective action and emphasizes more on social interaction and collaboration. The adoption and usage decision thus depends more on the (perceived) simultaneous behavior of their partners and it is important to recognize that mutual acceptance is a necessary condition for social network-facilitated team collaboration to occur. Over the past two decades, Information Systems (IS) researchers have demonstrated considerable interests in measuring usage intentions of information technology (Davis *et al.*, 1989; Venkatesh and Davis, 2000; Venkatesh *et al.*, 2003). However, the intention construct investigated in prior studies focused more on an individual's own intention to act but neglected the possible mutual dependence in the decision-making processes. Bagozzi (2007) has forcefully argued that traditional behavioral intention studies in the IS field needs to change and it is necessary to re-specify intentions when decisions involve 'mutual, shared, or in some other way joint processes' (p. 249). In an attempt to help fill this research gap, this study employs the concept of we-intention, implying commitment and agreement by the collectivity, to investigate participation in social network-facilitated team collaboration, in the specific context of social networks enabled by IM.

Some recent studies have demonstrated that the Internet gender gap is being bridged (Cobbs and Sentinel, 2005). Men no longer dominate the Internet population. Although men and women flock in almost equal percentages in terms of the use of the Internet, they may use it for very different reasons. For example, women are more enthusiastic about using email to communicate with friends and family, whereas men often use email more than women to communicate with various organizations. In addition, men are more likely to use the Internet to download music, play online games, listen to radio, and participate in sports fantasy leagues (Fallows, 2005). A recent study on the use of social networking sites in teens (Lenhart and Madden, 2007) has also identified many gender differences. For example, girls use social networking sites mainly to reinforce pre-existing friendships, whereas boys use the sites to flirt and make new friends. These variations yield some interesting gender-specific results that need further exploration. Specifically, it would be interesting to explore how males and females are different in terms of participation in online intentional social action in general and in social network-facilitated team collaboration in particular.

The purpose of this paper thus is to develop and test a preliminary model of we-intention to use IM in social network-facilitated team collaboration. By synthesizing and extending current research on goal-directed emotions, social influence theory, and prior literature on gender differences, this study aims to identify the key antecedents of we-intention and further examine possible gender differences in engaging in social network-facilitated team collaboration.

The rest of the paper is structured as follows. In next section, we address the theoretical background of this study. In the following section, we develop a research model

of we-intention and further propose the research hypotheses. This is followed by a detailed description of research methodology and results of data analysis. Finally, we conclude by discussing the key findings, the limitations of the study, and the implications for both research and practice.

## Theoretical background

In this section, the theoretical background of the study is reviewed. Specifically, the concept of we-intention is first discussed, followed by a discussion of the theory of reasoned action (TRA), research on goal-directed emotions, social influence theory, and previous gender research in IS field.

### We-intention

#### *Philosophical studies on we-intention*

The study of usage intention in the IS literature focuses on an individual's personal intention where one is in full charge of his/her own behavior. However, using IM for team collaboration within social networks definitely involves more than one person and they share joint control over the usage behavior. In this respect, prior philosophical studies have demonstrated that different types of conceptual schemes are required when plural subjects are involved (Gilbert, 1989). Philosophers examined the concept of group intention, which is often labeled as 'collective intention' (Searle, 1990), 'we-intention' (Tuomela, 1995), and 'shared intention' (Bratman, 1997). In these previous studies, we-intention was originally defined as a 'commitment of an individual to participate in joint action, and involves in an implicit and explicit agreement between the participants to engage in that joint action' (Tuomela, 1995: 2). This definition emphasizes the joint commitment and the mutual acceptance among group participants. It also clarifies the context within which we-intention is applicable and the mechanism through which we-intention may be developed.

In the past decade, scholars in philosophy have contributed a lot to the conceptual and logic foundation of we-intention. For example, Tuomela (2006) has identified four presumptions for we-intention to occur: (1) a group member intends to do his or her own part of the group activity, (2) each member believes that the opportunities for joint action, to some extent, exist and other members will perform their parts; in addition (3) there is a mutual belief among all the participants that the joint action opportunities will hold, and finally, (4) the intention to participate and perform the group activity depends on (2) and (3). In addition, Tuomela (2005) maintained that the beliefs required for we-intention are purely subjective and represent one's own perception of the reality. Therefore, if the above conditions are satisfied, a member may be the only agent with we-intention in a focal group (Bagozzi and Dholakia, 2002). In this regard, we-intention can be considered as an individual's subjective perception of the extent to which all participants in a collectivity will engage in a group activity together.

### Distinctions between i-intention and we-intention

As shown in Table 1, there are several features distinguishing we-intention from I-intention. First of all, there are differences in main targets and goal achievement processes. For I-intention, the referred target is a single person and the intention content is privately accepted. In contrast, plural subjects are involved in we-intention and participants collectively accept the intention content together. Second, reasons for acting are also different for the two kinds of intentions. People with we-intention are mainly motivated by group reasons, whereas people with I-intention are primarily motivated by personal reasons. Third, there are differences concerning commitment and behavioral control. In the circumstance of we-intention, people have a joint commitment and a shared authority over the collective action. However, this is contrary to I-intention where an individual is privately committed to and has full control over a personal activity. Finally, satisfaction conditions are also different between I-intention and we-intention. It is obvious that we-intention has necessary simultaneous satisfaction among all the participants as its special feature. We-intention and I-intention may co-exist in some specific contexts. For example, some social computing technologies, such as Wikipedia and del.icio.us, are rather useful in themselves and thus I-intention and we-intention can exist simultaneously. This is because one can use these technologies both individually and collectively to achieve his/her own goals, such as contributing knowledge regarding an interested event or building one's own net digest. However, for some other social computing tools such as groupware and social networking technologies, people cannot use these tools independently because such technologies themselves can make sense only when groups of people use them together. In this case, the usage behavior greatly depends on other participants' simultaneous usage and therefore only we-intention (but not I-intention) exists in this situation.

### We-intention research in social psychology and IS fields

The measurement and validation issues of the concept of we-intention recently have attracted much attention in social psychology research. As pioneers in this field, Bagozzi and his colleagues have done extensive empirical research on we-intention. Both individual-referent (e.g.,

attitude, perceived behavioral control, positive and negative anticipated emotions) and group-referent factors (e.g., group norms and social identity) are found to be significant in determining we-intention (Bagozzi and Lee, 2002; Bagozzi and Dholakia, 2002, 2006a,b; Dholakia *et al.*, 2004; Cheung *et al.*, 2010; Shen *et al.*, 2010). In addition, there are several moderators that influence this effect. For example, we-intention is primarily determined by social identity in interdependent-based culture, whereas by group norms in independent-based culture (Bagozzi and Lee, 2002). Results also indicated that the effect of group norms is more significant for users with lower usage experience, whereas the effect of social identity is more significant for users with higher usage experience (Bagozzi and Dholakia, 2006a; Shen *et al.*, 2010). The relationship between we-intention and actual behavior has also been examined across a wide range of group activities, from virtual community participation (Bagozzi and Dholakia, 2006a) to outing with motorcycle club friends (Bagozzi and Dholakia, 2006b). In the IS field, researchers are beginning to empirically examine the concept of 'we' in many different IT-enabled behavioral contexts, including digital piracy (Kwong and Lee, 2004), e-collaboration (Cheung *et al.*, 2007), social networking websites (Cheung *et al.*, 2010), and group work (Shen *et al.*, 2010). Table 2 provides a comprehensive summary of previous we-intention research in social psychology and IS fields.

### Theory of reasoned action

The TRA (Fishbein and Ajzen, 1975) provides a useful theoretical basis for the current study. In the past two decades, the TRA has been widely used by IS researchers to understand information technology adoption and usage behavior (Davis *et al.*, 1989; Venkatesh *et al.*, 2003). In the TRA, an individual's behavior is affected by behavioral intention, which in turn, is predicted by attitude toward the behavior and subjective norms surrounding the performance of the behavior. Although the TRA is successful in explaining a wide variety of behaviors, it has often been criticized for neglecting the affective aspects of attitude, and the weak predictive ability of subjective norms (Armitage and Conner, 2001; French *et al.*, 2005). To address these weaknesses, this study extends the TRA by integrating it with goal-directed emotions and social influence theory.

### Goal-directed emotions

As we mentioned above, attitude in the TRA is defined as 'a person's general feeling of favorableness and unfavorableness toward some stimulus object' (Fishbein and Ajzen, 1975: 216). The authors of TRA have provided clear guidance on how to elicit the behavioral beliefs, that is, asking the respondents what they think would be the advantages and disadvantages of performing a behavior (Ajzen and Fishbein, 1980). Following this recommendation, prior studies took a very narrow view of attitude and regarded it as an overall judgment of the utilitarian benefits derived from a particular behavior (Venkatesh *et al.*, 2000; Morris *et al.*, 2005). A number of prior studies have demonstrated that the relationships in TRA have not sufficiently captured the affective aspects in making a decision (Crites *et al.*, 1994; Manstead and Parker, 1995;

**Table 1** Distinctions between I-intention and we-intention

	<i>I-intention</i>	<i>We-intention</i>
Main targets	Singular subject	Plural subjects
Goal achievement	Privately accepted	Collectively accepted
Reasons for acting	Personal reasons	Group reasons
Commitment	Individual commitment	Joint commitment
Behavioral control	Full authority	Shared authority
Satisfaction conditions	Satisfaction for an individual	Simultaneous satisfaction

Table 2 Empirical we-intention research in social psychology and IS fields

Authors	Research context	Theory	Relationship tested ( <i>We-intention-related</i> )	Support?
Bagozzi and Lee (2002)	Having lunch with a group of friends	Theory of Reasoned Action	Attitude $\times$ Culture $\rightarrow$ We-intention Subjective Norms $\times$ Culture $\rightarrow$ We-intention Group Norms $\times$ Culture $\rightarrow$ We-intention Social Identity $\times$ Culture $\rightarrow$ We-intention	Not supported Supported Supported Supported
Bagozzi and Dholakia (2002)	Virtual chat room	Model of Goal-Directed Behavior	Desire $\rightarrow$ We-intention Group Norms $\rightarrow$ We-intention Social Identity $\rightarrow$ We-intention Past Behavior $\rightarrow$ We-intention Perceived Behavioral Control $\rightarrow$ We-intention	Supported Not Supported Not Supported Not Supported Not Supported
Dholakia <i>et al.</i> (2004)	Virtual communities from seven different types of Internet venues	Model of Goal-Directed Behavior	Group Norms $\rightarrow$ We-intention Desire $\rightarrow$ We-intention Social Identity $\rightarrow$ We-intention We-intention $\rightarrow$ Participation Behavior	Supported Supported Not Supported Supported
Bagozzi and Dholakia (2006a)	Linux user groups	Model of Goal-Directed Behavior	Perceived Behavioral Control $\rightarrow$ We-intention Attitude $\rightarrow$ We-intention Positive Anticipated Emotions $\rightarrow$ We-intention Negative Anticipated Emotions $\rightarrow$ We-intention Social Identity $\rightarrow$ We-intention We-intention $\rightarrow$ Participation in LUG Interaction We-intention $\rightarrow$ Visiting Linux Websites We-intention $\rightarrow$ Reading Linux Books/Magazines We-intention $\rightarrow$ Working with Linux We-intention $\rightarrow$ Money spent on Linux	Supported Supported Not Supported Supported Supported Supported Not Supported Supported Supported
Bagozzi and Dholakia (2006b)	Motorcycle groups	Theory of Planned Behavior	Desire $\rightarrow$ Social Intention Social Intention $\rightarrow$ Group Behavior	Supported Supported
Cheung <i>et al.</i> (2010)	Facebook	Social influence theory and social presence theory	Subjective Norms $\rightarrow$ We-intention Group Norms $\rightarrow$ We-intention Social Identity $\rightarrow$ We-intention Social Presence $\rightarrow$ We-intention	Not Supported Not Supported Supported Supported
Shen <i>et al.</i> (2010)	Instant messaging	Belief-desire-intention model and social influence theory	Subjective Norms $\rightarrow$ We-intention Group Norms $\rightarrow$ We-intention Social Identity $\rightarrow$ We-intention Desire $\rightarrow$ We-intention Subjective Norms $\times$ Experience $\rightarrow$ We-intention Group Norms $\times$ Experience $\rightarrow$ We-intention Social Identity $\times$ Experience $\rightarrow$ We-intention	Not Supported Supported Supported Supported Not Supported Supported Supported

van der Pligt *et al.*, 1998; French *et al.*, 2005). In addition to the advantages and disadvantages, affective questions, such as like/enjoy and dislike/hate, are also crucial for TRA studies in identifying a number of other salient beliefs (French *et al.*, 2005). The affective aspect of attitude can be regarded as the 'emotions and drives engendered by the prospect of performing a behavior' (French *et al.*, 2005: 1825). In this study, the importance of including affective factors heavily relies on the assumption that decision-making involves both reasoning and feeling (Komiak and Benbasat, 2006).

One response to this concern is to include goal-directed emotions as the predictors of behavioral intention (Richard *et al.*, 1998; Bagozzi and Dholakia, 2006a). Goal-directed anticipated emotions refer to the affective responses where an individual imagines the emotional consequences of goal achievement and goal failure before deciding to act (Bagozzi *et al.*, 1998). The rationale for the effects of anticipated emotions on behavioral intention is based on the argument that people will take emotional consequences into account before they decide to act in a goal-directed situation. Prior research has shown that anticipated affect provides additional explanation on behavioral intention beyond that of TRA variables (Conner and Armitage, 1998). Some recent studies on we-intention have also demonstrated that anticipated emotions are important predictors of virtual community participation we-intention (Bagozzi and Dholakia, 2002, 2006a).

#### Social influence theory

Subjective norms are often considered as one of the least understood aspects in TRA (Fishbein and Ajzen, 1975: 304). In a comparison study of TRA and technology acceptance model, Davis *et al.* (1989) have emphasized the role of social influence in information technology acceptance and usage behavior and further suggested that Kelman's social influence theory can be considered as a theoretical framework for developing knowledge in this area. Kelman (1958) has distinguished three distinct aspects of social influence processes, including compliance, internalization, and identification. Compliance occurs when an individual accepts the influence to get support, approval or a favorable reaction from significant others. The acceptance of compliance therefore is because of the accompanied 'social effects.' Subjective norms in the TRA are often used to reflect the influence of social normative compliance and typically operationalized in terms of influence from general public whose opinions are important. Internalization represents the process through which people incorporate external things into one's own psychological processes and it occurs when an individual accepts the influence because of the content of the targeted behavior. The behavior thus is intrinsically rewarding and congruent with one's own goals or values. Such values may include beliefs, attitudes or more abstract moral tenets (Bagozzi and Lee, 2002). Accordingly, internalization can be achieved mainly because of the relevance of the themes and issues. Finally, identification refers to one's conception of self in terms of thinking, feeling and acting on the basis of a 'group level of self' (as a member of the group) instead of a 'personal self' (Turner, 1987). Identification occurs when an individual

accepts the influence to establish or maintain a satisfying self-defining relationship with another person or group. Therefore, the adoption of a targeted behavior through identification is primarily because of the desired relationships and social interactions.

#### Gender and IS research

There is a growing body of research in the investigation of gender differences in information technology adoption and diffusion (Adam, 2002; Wilson, 2004). As shown in Table 3, gender has been widely studied as an independent or moderator variable in prior IS research. These studies indicated that men are more likely to engage in task-oriented or instrumental behavior and therefore attitude toward the use of IT will be more salient for men than women (Venkatesh *et al.*, 2000, 2004; Morris *et al.*, 2005). In contrast, women are more likely to conform to a majority opinion and more relationship-oriented than men (Venkatesh *et al.*, 2000). As a result, subjective norms and identification will influence women more strongly than men (Venkatesh and Morris, 2000; Morris *et al.*, 2005). In addition, men and women have different perceptions of innovation characteristics (Gefen and Straub, 1997; Van Slyke *et al.*, 2002) and Internet usage patterns (Teo, 2001). The different influence patterns between men and women therefore demonstrate the moderating effect of gender (Ilie *et al.*, 2005). Recently, the gender differences in the use of social networking technologies were also reported (Lenhart and Madden, 2007). For youth aged between 15 and 17, 70% of girls have used online social network services, whereas only 54% of boys have done so. In addition, teen boys are more likely to actually use different online networking features in social networking communities, whereas teen girls mainly use social networking to keep contact with old friends. Most recently, Zhang *et al.* (2009) have empirically demonstrated the existence of gender effects in post-adoption behavior in the context of blogger's switching their blog services. Table 3 provides a more detailed summary of prior empirical IS research on gender differences.

#### Research framework

Figure 1 depicts the research framework used in this study. This framework integrates anticipated emotions and social influence theory into the TRA. We expect gender will moderate the effects of attitude, positive/negative anticipated emotions, and social influence factors on we-intention to use IM in social network-facilitated team collaboration. The constructs and their relationships are discussed in detail in the following sections.

#### Attitude toward using IM

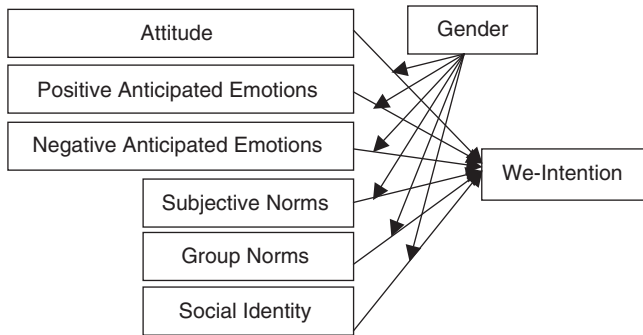
Using IM in social network-facilitated team collaboration in some sense is a collective action. This is because a person cannot use this technology on an individual basis until his/her partners in the social networks use it together. Compared to the traditional I-intention approach, we-intention captures the perception of 'we' and the joint commitment among members in one's social networks. It reflects an individual's perception of the extent to which people in his/her social networks are jointly willing to act

Table 3 Gender and empirical IS research

Authors	IT under study	Theory	Relationship tested (Gender-related)	Support?
Gefen and Straub (1997)	Electronic mail	Technology acceptance model	Gender → Social Presence Gender → Perceived Usefulness Gender → Perceived Ease of Use Gender → Use of E-mail	Supported Supported Supported Not Supported
Venkatesh <i>et al.</i> (2000)	A system for data and information retrieval	Theory of planned behavior	Attitude × Gender → Behavioral Intention Subjective Norm × Gender → Behavioral Intention Perceived Behavioral Control × Gender → Behavioral Intention Perceived Behavioral Control × Gender → Usage Behavior Behavioral Intention × Gender → Short-term Usage Behavior Prior Usage Behavior × Gender → Subsequent Intention Prior Usage Behavior × Gender → Subsequent Usage Behavior Attitude × Gender → Subsequent Intention Subjective Norm × Gender → Subsequent Intention Perceived Behavioral Control × Gender → Subsequent Intention Behavioral Intention × Gender → Subsequent Usage Behavior	Supported Supported Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported Not Supported
Venkatesh and Morris (2000)	A system for data and information retrieval	Technology acceptance model	Perceived Usefulness × Gender → Behavioral Intention Perceived Ease of Use × Gender → Behavioral Intention Perceived Ease of Use × Gender → Perceived Usefulness Subjective Norm × Gender → Behavioral Intention	Supported Supported Not Supported Supported
Teo (2001)	Internet	Motivational model	Gender → Use Internet for Messaging Gender → Use Internet for Browsing Gender → Use Internet for Downloading Gender → Use Internet for Purchasing	Supported Not Supported Supported Supported
Van Slyke <i>et al.</i> (2002)	Shopping websites	Innovation diffusion theory	Gender → Intention to Shop via the Web Gender → Compatibility Gender → Complexity Gender → Image Gender → Relative Advantage Gender → Result Demonstrability Gender → Trust	Supported Supported Supported Not Supported Supported Supported Supported
Durndell and Haag (2002)	Internet	Self-efficacy theory	Gender → Computer Self-Efficacy Gender → Computer Anxiety Gender → Attitude Gender → Use of Internet	Supported Supported Supported Supported
Venkatesh <i>et al.</i> (2003)	Organization-wide information systems	UTAUT	Performance Expectancy × Gender → Behavioral Intention Effort Expectancy × Gender → Behavioral Intention Social Influence × Gender → Behavioral Intention	Supported Supported Supported

Table 3 Continued

<i>Authors</i>	<i>IT under study</i>	<i>Theory</i>	<i>Relationship tested (Gender-related)</i>	<i>Support?</i>
Venkatesh <i>et al.</i> (2004)	Organization-wide information systems	Theory of planned behavior	Attitude $\times$ Psychological Gender $\rightarrow$ Behavioral Intention Subjective Norm $\times$ Psychological Gender $\rightarrow$ Behavioral Intention Perceived Behavioral Control $\times$ Psychological Gender $\rightarrow$ Behavioral Intention	Supported Supported Supported
Ilie <i>et al.</i> (2005)	Instant messaging	Innovation diffusion theory	Perceived Relative Advantage $\times$ Gender $\rightarrow$ Behavioral Intention Perceived Ease of Use $\times$ Gender $\rightarrow$ Behavioral Intention Perceived Visibility $\times$ Gender $\rightarrow$ Behavioral Intention Perceived Result Demonstrability $\times$ Gender $\rightarrow$ Behavioral Intention Perceived Critical Mass $\times$ Gender $\rightarrow$ Behavioral Intention	Supported Supported Supported Supported Supported
Morris <i>et al.</i> (2005)	Enterprise-wide systems	Theory of planned behavior	Attitude $\times$ Gender $\times$ Age $\rightarrow$ Behavioral Intention Subjective Norm $\times$ Gender $\times$ Age $\rightarrow$ Behavioral Intention Perceived Behavioral Control $\times$ Gender $\times$ Age $\rightarrow$ Behavioral Intention	Supported Supported Supported
Ahuja and Thatcher (2005)	IT (but does not specify)	Theory of trying	Autonomy $\times$ Gender $\rightarrow$ Trying to Innovate Overload $\times$ Gender $\rightarrow$ Trying to Innovate Autonomy $\times$ Quantitative Overload $\times$ Gender $\rightarrow$ Trying to Innovate Autonomy $\times$ Qualitative Overload $\times$ Gender $\rightarrow$ Trying to Innovate	Supported Supported Supported Supported
Ong and Lai (2006)	E-Learning technology	Technology acceptance model	Gender $\rightarrow$ Computer Self-efficacy Computer Self-efficacy $\times$ Gender $\rightarrow$ Perceived Usefulness Computer Self-efficacy $\times$ Gender $\rightarrow$ Perceived Ease of Use Gender $\rightarrow$ Perceived Usefulness Perceived Usefulness $\times$ Gender $\rightarrow$ Behavioral Intention Gender $\rightarrow$ Perceived Ease of Use Perceived Ease of Use $\times$ Gender $\rightarrow$ Perceived Usefulness Perceived Ease of Use $\times$ Gender $\rightarrow$ Behavioral Intention Gender $\rightarrow$ Behavioral Intention	Supported Supported Supported Supported Supported Supported Supported Not Supported Supported
Djamasbi and Loiacono (2008)	Decision support systems	Social feedback theory	Negative Outcome Feedback $\times$ Gender $\rightarrow$ Overall Mood Feedback Treatment $\times$ Gender $\rightarrow$ Decision Accuracy	Supported Supported
Zhang <i>et al.</i> (2009)	Blogging Systems	Social role theory	Satisfaction $\times$ Gender $\rightarrow$ Switching Intention Attractive Alternative $\times$ Gender $\rightarrow$ Switching Intention	Supported Supported



**Figure 1** Research model.

something together. In this regard, the traditional individual intention in the TRA is replaced by we-intention in the current study. Consistent with the assumptions outlined in the TRA, we-intention thus is assumed as determined by attitude toward the use of IM. In addition, prior gender research on information technology adoption consistently suggested that attitude is more important for men than for women because men focus more on instrumentality and goals of a particular behavior (Venkatesh *et al.*, 2000; Morris *et al.*, 2005). Based on the discussion above

**H1a:** Attitude will have a positive impact on we-intention to use IM in social network-facilitated team collaboration.

**H1b:** The impact of attitude on we-intention to use IM in social network-facilitated team collaboration will be stronger for men than for women.

#### Goal-directed emotions

As we discussed above, prior studies that built on the TRA have used a more utilitarian perspective to measure attitude. The affective aspects in making a decision are addressed in this study through goal-directed emotions. Goal-directed emotions in this study are defined as the affective responses where an individual imagines the emotional consequences of using or not using IM in social network-facilitated team collaboration. The existing literature on goal-directed emotions suggested that both positive and negative anticipated emotion should be considered in understanding human behavior. Positive anticipated emotion refers to the affective reactions toward being able to do something, whereas negative anticipated emotion results from being unable to do this. An individual has both positive and negative anticipated emotions simultaneously because of the different affective responses from goal achievement and goal failure. However, positive and negative anticipated emotions in this context are not mirror images of each other and they may well be asymmetric since they arise from different events. It is quite possible that a person may become exceedingly happy if his/her goal is achieved (e.g. winning a lottery) but at the same time not too disappointed if he/she fails to meet the goal. Consistent with previous literature (Bagozzi and Dholakia, 2002, 2006a), if people anticipate positive

emotions toward being able to using IM in social network-facilitated team collaboration, they will be more likely to form a we-intention to obtain these positive emotions. On the other hand, if they anticipate negative emotions from being unable to use IM in social network-facilitated team collaboration, they will try to develop a we-intention with other participants together in order to avoid the negative emotions. Therefore

**H2a:** Positive anticipated emotions from being able to use IM in social network-facilitated team collaboration will have a positive impact on we-intention to do so.

**H3a:** Negative anticipated emotions from being unable to use IM in social network-facilitated team collaboration will have a positive impact on we-intention to do so.

Empirical studies in psychology and consumer research have provided ample evidence that men place more value on positive emotions and in contrast, women place more value on negative emotions (Roberts, 1991; Dube and Morgan, 1996; Putrevu, 2001). This may be because of the fact that men are more self-confident and independent compared to women (Venkatesh *et al.*, 2000). In addition, prior research has consistently reported that women are more sensitive to the negative effects, such as sadness and anxiety, than men (Fujita *et al.*, 1991; Thomsen *et al.*, 2005). In the current study, positive anticipated emotions represent affective responses toward successfully using IM, whereas negative anticipated emotions represent affective responses toward unsuccessfully using IM in social network-facilitated team collaboration. Based on prior findings in gender research, the impacts of positively affective response in this study may be stronger for men, whereas the impact of negatively affective response may be stronger for women. Therefore

**H2b:** The impact of positive anticipated emotions on we-intention to use IM in social network-facilitated team collaboration will be stronger for men than for women.

**H3b:** The impact of negative anticipated emotions on we-intention to use IM in social network-facilitated team collaboration will be stronger for women than for men.

#### Social influence processes

Social influence underlying the compliance process is represented by subjective norms in this study. Subjective norms have received considerable empirical support as an important antecedent of behavioral intention (Fishbein and Ajzen, 1975; Venkatesh *et al.*, 2003). In the current context, if people believe the use of IM in social network-facilitated team collaboration will bring a favorable reaction from significant others, they will be more likely to have a we-intention to use it together. In addition, prior studies involving comparison between women and men in terms of compliance indicated that women are more likely to comply, in contrast men tend to rebel an order (Stockard *et al.*, 1988). Recent IS research on gender difference also reported similar results that the effects of subjective norms





will be more significant to women than men (Venkatesh *et al.*, 2003). Therefore

**H4a:** Subjective norms will have a positive impact on we-intention to use IM in social network-facilitated team collaboration.

**H4b:** The impact of subjective norms on we-intention to use IM in social network-facilitated team collaboration will be stronger for women than for men.

Internalization process is represented in the current research through the effects of group norms. Social influence in this way is captured by the similarity of one's goals or values with that of their referent group. In the current study, if people think the use of IM is useful for supporting team collaboration with other members in their social networks or find it congenial to their own values and goals, they will be motivated by internalized values and be more likely to have a we-intention to use it with others together. Since **men are more task-oriented** (Venkatesh and Morris, 2000), if they find the use of IM is congruent with their goals and values, such as enabling convenient communication or facilitating team collaboration, they will have a higher chance than women to adopt and use IM in social network-facilitated team collaboration. Therefore

**H5a:** Group norms will have a positive impact on we-intention to use IM in social network-facilitated team collaboration.

**H5b:** The impact of group norms on we-intention to use IM in social network-facilitated team collaboration will be stronger for men than for women.

The third social influence process is identification, which is characterized by social identity in the current study. Ellemers *et al.* (1999) suggested that social identity involves three related but distinct aspects, including 'a cognitive component (a cognitive awareness of one's membership in a social group – self-categorization), an evaluative component (a positive or negative value connotation attached to this group membership – group self-esteem), and an emotional component (a sense of emotional involvement with the group – affective commitment)' (p. 372). As we mentioned before, an individual accepts the identification influence in order to build or maintain a close relationship with another person or group. Prior studies have demonstrated that if people identify themselves with a social group, they will be more likely to form a we-intention to engage in the group activities because of the desired relationships (Bagozzi and Lee, 2002; Bagozzi and Dholakia, 2006a). In addition, previous research on gender differences have found that women are more relationship-oriented compared to men (Minton and Schneider, 1980); therefore they tend to pursue some activities that are related to relationship building and maintenance, and accordingly the effect of identification may be more important for women than for men. Based on the discussion above

**H6a:** Social identity will have a positive impact on we-intention to use IM in social network-facilitated team collaboration.

**H6b:** The impact of social identity on we-intention to use IM in social network-facilitated team collaboration will be stronger for women than for men.

## Research method

The objective of this study is to identify factors predicting we-intention to use IM in social network-facilitated team collaboration, and to investigate whether gender differences exist within this context. The current study was conducted in Mainland China during May to July 2006. Measurements, data collection method, and survey responses are reported in this section in detail.

### Measurements

All measures used in this study have been validated in prior studies (as shown in Appendix A). Minor changes in the wordings were made so as to fit the specific research context. We adapted items for attitude, subjective norms, group norms, social identity, and we-intention from Bagozzi and Lee (2002) and items for positive and negative anticipated emotions from Bagozzi *et al.* (1998). Since this study was conducted in Mainland China, the questionnaire was translated into Chinese first and a backward translation method was used to ensure the consistency between the Chinese and the English version of the questionnaire. A pilot test was also conducted to refine the questionnaire wordings, assess logical consistencies, judge ease of understanding, and identify areas for improvement. Overall, the questionnaire was regarded as concise and easy to complete.

### Data collection method

University students who use QQ IM for group communication and collaboration (e.g., discussing group projects or class assignments) were invited to participate. QQ is the most popular IM in Mainland China and estimated to have over 300 million active accounts at the end of March 2008. More important, it provides QQ Groups for users with common interests or experiences to communicate and collaborate together (as shown in Figure 2). Each member in QQ Group can initiate a discussion by sending a message to the group and it thus provides a shared online space for effective social network-facilitated team collaboration. Both a paper-and-pencil survey and an online survey were used for data collection. This mixed-mode approach is designed to mitigate against coverage errors or other biases resulting from data collection method (Wallace *et al.*, 2004). All participation in this study was voluntary and yet motivated by a lucky draw among successful respondents.

The reason why we choose survey method is that it has some clear advantages over other types of data collection methods in our current research settings. Particularly, it is an efficient way of collecting information from a large number of respondents and it is relatively easy to administer since only question of interests are asked, collected and analyzed. In addition, it is very attractive because it allows researchers to determine the values and the relations of variables, provides responses that can be generalized to other populations, offers a way to compare responses across different groups, times and places, allows

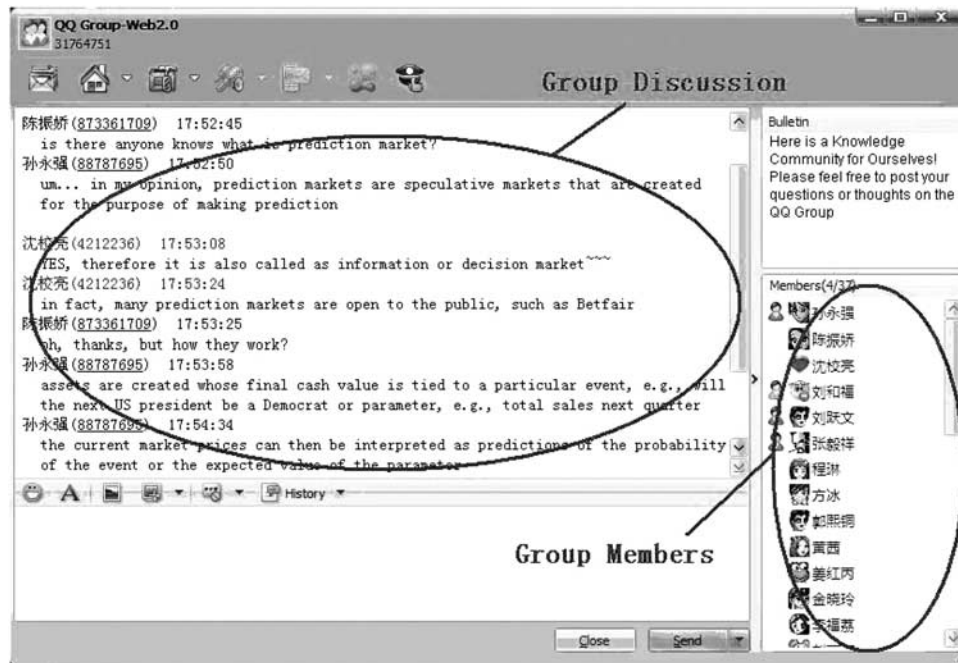


Figure 2 Screenshot of QQ group.

the testing of theoretical propositions in an objective fashion, and helps to confirm the findings from qualitative research (Newsted *et al.*, 1998).

A screening question was used to identify respondents who have experience with the use of IM in social network-facilitated team collaboration. This study was then introduced as an 'opinion survey.' Respondents were asked to imagine that they are using IM to discuss a topic with the group of friends that they frequently communicate or collaborate with. They were further required to 'picture briefly in your mind the name and image of each friend and write your nickname and their nicknames in the table below.' These instructions were designed to capture the group with which the respondents develop we-intention to use IM in social network-facilitated team collaboration.

A group of business students in a local university in Mainland China were invited to participate in the paper-and-pencil survey. Students from six randomly selected classes were encouraged to complete the questionnaire. Before they filled in the questionnaire, the purpose and the scenario of the survey were first instructed. Only students who have used IM for group discussion with friends in their social networks were asked to fill in the questionnaire. A total of 319 students participate and finally 301 usable questionnaires were returned in this part of the survey, with a 94.4% response rate.

A self-administrative online questionnaire was posted in the Bulletin Board System (BBS) of this university simultaneously. Online survey design has lots of advantages, including lower overall costs, allowing electronic input, reducing response bias, facilitating data collection from a large amount of respondents, convenience to having automated data collection and more flexibility in questionnaire design (Boyer *et al.*, 2002). Finally, a total of 181 usable questionnaires were collected through this method.

### Survey responses

The final sample consists of a total of 482 respondents, out of which 313 were male (64.9%) and 169 were female (35.1%). A large majority (60.6%) of the respondents were aged between 21 and 25 years. On the whole, the respondents were relatively experienced with more than 2 years in using IM (89.4%) and spent more than 1 h on IM per day (85.5%). Table 4 provides a summary of the overall sample characteristics of the respondents.

### Data analysis and results

PLS-Graph (Partial Least Squares) version 3.00 was used to test the proposed research framework. The PLS procedure (Wold, 1989) is a second-generation multivariate technique which can assess the measurement model and the structural model simultaneously in one operation. Different from the covariance-based SEM (Structural Equation Modeling) approach (i.e., LISREL) that is more suitable for theory testing, the component-based SEM approach (i.e., PLS) is more predictive-oriented (Joreskog and Wold, 1982) and is considered to be most appropriate in the initial exploratory stages of theory development (Chin, 1998). As we discussed before, this study tries to identify the factors determining we-intention to engage in social network-facilitated team collaboration, thus it is exploratory in nature. Based on this reasoning, we have chosen PLS as the primary data analysis technique. Following the two-step analytical procedures, the measurement model was first examined and then the structural model was assessed (Hair *et al.*, 1998).

### Measurement model

Convergent validity indicates to what extent the items of an instrument that are theoretically related should be related in reality. We assessed the convergent validity by

**Table 4** Sample characteristics

Characteristics	Number (N = 482)	Percentage
<i>Age</i>		
< 21 years	97	20.1
21–25 years	292	60.6
26–30 years	76	15.8
> 30 years	17	3.5
<i>Gender</i>		
Male	313	64.9
Female	169	35.1
<i>Experience with instant messaging</i>		
≤ 2 years	51	10.6
2–5 years	224	46.5
> 5 years	207	42.9
<i>Time spent on instant messaging per day</i>		
< 1 h	70	14.5
1–2 h	201	41.7
> 2 h	211	43.8

examining the composite reliability and the average variance extracted from the measures (Hair *et al.*, 1998). Composite reliability refers to the internal consistency of the indicators measuring a given factor and average variance extracted indicates the amount of variance captured by a construct as compared to the variance caused by the measurement error. A composite reliability of 0.70 or above and an average variance extracted of more than 0.50 are deemed acceptable (Fornell and Larcker, 1981). As shown in Table 5, all the measures exceed the recommended thresholds. In addition, Table 6 exhibits the loadings of the construct measures and the descriptive statistics of the measures, including mean, standard deviation, minimum and maximum. The results indicated that all measures are statistically significant on their path loadings at the level of 0.01.

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 and Larcker, 1981). Table 5 presents the correlation matrix of the constructs and the square roots of the average variance extracted. The results demonstrate an adequate level of discriminant validity of the measurements.

**Table 5** Reliability and discriminant validity

	CR	AVE	ATT	PAE	NAE	SN	GN	SI	WE
<i>Full sample (N = 482)</i>									
ATT	0.909	0.769	<b>0.877</b>						
PAE	0.932	0.733	0.473	<b>0.856</b>					
NAE	0.959	0.747	0.070	0.166	<b>0.864</b>				
SN	0.930	0.868	0.179	0.133	−0.019	<b>0.932</b>			
GN	0.898	0.814	0.363	0.395	0.037	0.140	<b>0.902</b>		
SI	0.911	0.673	0.466	0.587	0.054	0.151	0.457	<b>0.820</b>	
WE	0.905	0.827	0.441	0.563	0.219	0.084	0.431	0.494	<b>0.909</b>
<i>Women (N = 169)</i>									
ATT	0.916	0.784	<b>0.885</b>						
PAE	0.937	0.748	0.537	<b>0.865</b>					
NAE	0.957	0.737	0.142	0.347	<b>0.858</b>				
SN	0.938	0.884	0.179	0.225	0.050	<b>0.940</b>			
GN	0.902	0.822	0.435	0.454	0.280	0.098	<b>0.907</b>		
SI	0.925	0.711	0.565	0.607	0.236	0.162	0.538	<b>0.843</b>	
WE	0.909	0.833	0.499	0.596	0.352	0.179	0.478	0.593	<b>0.913</b>
<i>Men (N = 313)</i>									
ATT	0.905	0.761	<b>0.872</b>						
PAE	0.930	0.726	0.473	<b>0.852</b>					
NAE	0.960	0.752	0.070	0.166	<b>0.867</b>				
SN	0.922	0.855	0.179	0.133	−0.019	<b>0.925</b>			
GN	0.894	0.808	0.363	0.395	0.037	0.140	<b>0.899</b>		
SI	0.904	0.654	0.466	0.587	0.054	0.151	0.457	<b>0.809</b>	
WE	0.904	0.824	0.441	0.563	0.219	0.084	0.431	0.494	<b>0.908</b>

*Note:* CR = Composite Reliability, AVE = Average Variance Extracted, ATT = Attitude, PAE = Positive Anticipated Emotions, NAE = Negative Anticipated Emotions, SN = Subjective Norms, GN = Group Norms, SI = Social Identity, WE = We-Intention. The bold numbers in the diagonal row are square roots of average variance extracted.

**Table 6** Descriptive statistics

<i>Constructs</i>	<i>Item</i>	<i>Loading</i>	<i>t-value</i>	<i>Mean</i>	<i>St.Dev</i>	<i>Min</i>	<i>Max</i>
Attitude	ATT1	0.883	63.10	5.11	1.303	1	7
	ATT2	0.844	41.12	5.05	1.255	1	7
	ATT3	0.902	86.87	5.20	1.278	1	7
Positive anticipated emotions	PAE1	0.857	42.30	4.42	1.292	1	7
	PAE2	0.876	57.76	4.50	1.241	1	7
	PAE3	0.870	46.60	4.77	1.312	1	7
	PAE4	0.855	53.88	4.96	1.315	1	7
	PAE5	0.823	43.49	4.72	1.322	1	7
Negative anticipated emotions	NAE1	0.824	43.40	3.17	1.569	1	7
	NAE2	0.867	48.77	3.15	1.603	1	7
	NAE3	0.856	47.47	2.98	1.620	1	7
	NAE4	0.845	52.18	3.29	1.656	1	7
	NAE5	0.894	62.56	3.06	1.691	1	7
	NAE6	0.885	73.29	3.05	1.627	1	7
	NAE7	0.876	61.77	3.01	1.694	1	7
	NAE8	0.866	52.17	3.05	1.648	1	7
Subjective norms	SN1	0.918	7.01	4.64	1.496	1	7
	SN2	0.946	10.57	4.68	1.525	1	7
Group norms	GN1	0.905	55.10	4.79	1.524	1	7
	GN2	0.900	59.04	4.55	1.161	1	7
Social identity	SI1	0.839	47.03	4.51	1.257	1	7
	SI2	0.842	59.62	4.69	1.350	1	7
	SI3	0.814	38.50	4.62	1.430	1	7
	SI4	0.830	42.81	4.61	1.412	1	7
	SI5	0.775	28.21	4.62	1.453	1	7
We-intention	WE1	0.918	112.56	4.92	1.333	1	7
	WE2	0.901	61.37	4.69	1.429	1	7

### Structural model

The results of data analysis are summarized in Table 7. Test of significance of all paths were performed using the bootstrap re-sampling procedure. The research model with full sample accounts for 44 % of the variance in we-intention to use IM in social network-facilitated team collaboration. The results indicate that positive anticipated emotions have the strongest impact on we-intention, with a path coefficient at 0.292, followed by social identity, group norms, attitude and negative anticipated emotions, with path coefficients at 0.186, 0.159, 0.149 and 0.140, respectively. Subjective norms, however, do not have a statistically significant impact on we-intention (H4a is not supported).

To evaluate the moderating effect of gender, the data were divided into two groups for further analysis. As shown in Table 7, different influence patterns have been found between women and men. The research model accounts for 48.8% of the variance in we-intention for the subgroup of women and 42.4% of the variance in we-intention for the subgroup of men. Anticipated emotions and social identity were significant predictors of we-intention to use IM in

social network-facilitated team collaboration for women, and all factors (except subjective norms) exerted significant effects on we-intention for men. Subjective norms were not found to be statistically significant for both groups, indicating no difference between men and women (H4b is not supported). The significance of difference in path coefficients between the two subgroups was calculated using the procedure described in Keil *et al.* (2000) (see Appendix B). As we expected, the results demonstrated that the effects of negative anticipated emotions and social identity were more significant for women, whereas the effects of attitude, positive anticipated emotions, and group norms were more significant for men. A summary of the results pertaining to each hypothesis in the current study is shown in Table 8.

### Discussion and conclusion

IM services provide online social networking platforms for people with common interests and goals to communicate and work together. Building on recent studies and practices demonstrating the potentials of social

**Table 7** Model summary

	Full sample (N = 482)		Women (N = 169)		Men (N = 313)		Women vs men
	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$	R <sup>2</sup>	$\beta$	
ATT → WE	0.440	0.149***	0.488	0.139 <sup>a</sup>	0.424	0.152**	*
PAE → WE		0.292***		0.252**		0.309***	***
NAE → WE		0.140***		0.149**		0.141***	*
SN → WE		0.006 <sup>a</sup>		0.036 <sup>a</sup>		−0.031 <sup>a</sup>	—
GN → WE		0.159***		0.120 <sup>a</sup>		0.182**	***
SI → WE		0.186***		0.256***		0.155*	***

<sup>a</sup>non-significant; \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

Notes: The significance of difference in path coefficients between the subgroups of women and men was calculated using the procedure described in Keil *et al.* (2000) (see Appendix B).

**Table 8** Summary of results

Hypothesized relationships	Support?
H1a: ATT → We-intention	Yes
H1b: ATT × gender → We-intention	Yes
H2a: PAE → We-intention	Yes
H2b: PAE × gender → We-intention	Yes
H3a: NAE → We-Intention	Yes
H3b: NAE × gender → We-intention	Yes
H4a: SN → We-intention	No
H4b: SN × gender → We-intention	No
H5a: GN → We-Intention	Yes
H5b: GN × gender → We-intention	Yes
H6a: SI → We-Intention	Yes
H6b: SI × gender → We-intention	Yes

networking in team coordination and collaboration, this study aims to examine the factors affecting we-intention to use IM in social network-facilitated team collaboration, and the effect of gender differences in the collective acceptance of instant messaging. This section first discusses the key findings, and then addresses the limitations of this study, followed by the implications for both research and practice.

### Discussion of key findings

The research model extends the TRA into a social networking environment where participants develop we-intention to use Im for team collaboration together with other partners in their social networks. We integrate goal-directed emotions and social influence theory into the TRA to provide a more comprehensive picture through looking at the effects of cognition, emotions, and social influence. The measurement model is confirmed with adequate convergent and discriminant validity for all the measures. The structural model explains 44% of the variance in we-intention for the full sample, 48.8% of the variance in we-intention for women and 42.4% of the variance in we-intention for men. The results support most of the hypotheses proposed in the research model.

### The roles of anticipated emotions and social influence

Goal-directed emotions and social influence processes are included in our research model. Both positive and negative anticipated emotions are found to be significant predictors of we-intention. This finding is consistent with recent studies investigating anticipated emotions in virtual communities (Bagozzi and Dholakia, 2002, 2006a). If IM users anticipate positive emotions from the usage behavior, they will be more likely to form we-intention to use it with friends in their social networks. On the other hand, if they foresee the possible negative emotions from being unable to use Im, they thus will try to avoid the negative emotions through using Im with others together.

Among the three social influence processes, the effect of subjective norms is not found to be significant in determining we-intention. One possible explanation is that we used a student sample and the use of Im for team collaboration among university students tends to be voluntary. In addition, they already have a lot of experience with the use of Im (as shown in Table 4, nearly 90% of the respondents have used Im more than 2 years). Prior research has demonstrated that subjective norms matter only when the technology in question was mandatory and users had limited technical experiences (Karahanna *et al.*, 1999; Venkatesh and Davis, 2000). Another explanation (as suggested by the anonymous reviewers to whom we are grateful) is that in a group action context individual's behavioral tendency seem to be influenced more by the group-referent social influences, such as group norms and social identity, rather than the general public's opinions, such as subjective norms. This is because the target action only occurs within the group and people may not really care about how other people outside the group think. According to this reasoning, the effect of subjective norms on we-intention seems insignificant in the current context. Instead, in voluntary collaboration contexts and with the richness of user experience, internalization and identification play a more important role (Venkatesh *et al.*, 2003; Bagozzi and Dholakia, 2006a). In the current study, group norms and social identity exert significant effects on we-intention to use Im. This finding also echoes with previous literature demonstrating that internalization and identification are the two most important social influence processes in online virtual communities (Dholakia *et al.*, 2004).

### The roles of gender

Consistent with previous gender research on information technology usage, factors determining the use of Im in social network-facilitated team collaboration are very different between men and women. Specifically, attitude, positive anticipated emotions and group norms are more significant for men. The significance of attitude and group norms rests on the fact that men are more likely to assess the advantages and disadvantages of a given behavior (Venkatesh *et al.*, 2000; Ilie *et al.*, 2005). If using Im for team collaboration is beneficial and congenial to their goals, men always tend to use it. In addition, because men tend to be more self-confident in their behaviors and focus more on positive implications of their involvement, they will be more likely to be influenced by positive anticipated emotions. In contrast, women tend to report more negative affects (Thomsen *et al.*, 2005) and place more value on negative emotions arise from goal failure (Dube and Morgan, 1996; Putrevu, 2001); therefore, negative anticipated emotions were more pronounced for women in this study. In addition, since women tend to be more relationship-oriented than men (Minton and Schneider, 1980), as we hypothesized, social identity thus exerts a more significant effect on we-intention for women.

### Limitations of this study

Before highlighting the implications, the limitations of this study are first discussed. First of all, this study was conducted in Mainland China. Therefore it is possible that culture may bias the development of we-intention to use Im in social network-facilitated team collaboration (Bagozzi and Lee, 2002). Future cross-cultural studies should further examine these issues. Second, actual usage and participation behavior were not examined in this study. Therefore, a longitudinal study is highly recommended in future research to determine the effect of we-intention on actual behavior. Third, some scales adopted from previous studies need further refinement (e.g., two-item only scales). In addition, future research should continue to develop and validate the factors specific to we-intention, such as joint commitment and shared authority as identified in Table 1, to provide a more comprehensive explanation of we-intention. Finally, the overall research model explains 44% of the variance in we-intention to use Im for team collaboration. Although an *R*-square figure of 44% in social science research is considered very adequate, future research should nonetheless extend this line of research and further investigate the effects of other important factors, such as trust (e.g. Lee and Turban, 2001), in the collective participation of social network-facilitated team collaboration.

### Implications for research

The concept of we-intention is especially important for studies on social network-facilitated team collaboration because using Im in team collaboration can make sense only when groups of people want to adopt and use it together on a regular basis. The current study explored this fundamental issue by focusing on the factors affecting we-intention to use Im and the gender differences in the variables predicting we-intention. The rationality of the

inclusion of we-intention is built on the fact that people's decisions are interdependent in the area of social networks and the group goal cannot be achieved by a person individually. This study thus provides a starting point for future research into Web 2.0 technology in general and social networking in particular. Bagozzi and Lee (2002) have also suggested that the social antecedents and the group action can be measured based on shared consciousness or understanding perceived by a focal member in the group. Therefore, future research employing a group-level analysis is highly recommended in this area. Some potential issues in this area may include the roles of group size and composition. In addition, to the best of our knowledge, this study represents the first theory-driven empirical investigation examining gender differences in the formation of we-intention. This study thus is expected to enrich existing gender literature by examining how men and women are different in the process of participating in social network-facilitated team collaboration.

This study also contributes to existing social computing research by adding to the limited research done on the group use of Im and allows future research to build upon it. Group norms and social identity are the two most important social influence processes determining we-intention to use Im in social network-facilitated team collaboration. Future research on social computing tools should take these two processes into account, especially in a voluntary usage context. In addition, as we had expected, both positive and negative anticipated emotions exert significant effects on we-intention, providing additional explanation on how we-intention to use Im for team collaboration are formed. Positive and negative emotions in this context are independent states (i.e. not mirror images) arising from different instances of the goal (i.e. success and failure). They are very likely asymmetric as the intensity of emotion generated by goal success and goal failure may be very different. The role of emotions in the acceptance and use of social computing technologies, and factors contributing to anticipated emotions thus should deserve greater attention in future research.

Finally, this study contributes to research on team collaboration, especially in the context of Im -supported social networks. As a convenient Internet-based communication medium, Im has gained widespread popularity among youths. When they enter the workplace, they will naturally use Im for work discussion with their colleagues. However, there may be some differences between the two types of use. For example, the use of Im for team collaboration may be more task-oriented in the workplace and more social-emotion-oriented in conversations with friends (Liu, 2002). It is thus necessary to investigate the formation of we-intention to use Im in social network-supported team collaboration in the two different contexts in future research.

### Implications for practice

Although this study leads to several interesting implications for research, it also offers some practical implications for practitioners. Prior studies dealing with the use of Im in the workplace have consistently suggested that Im was primarily used for complex work discussions with other

colleagues in one's professional social networks (Isaacs et al., 2002). This issue is also managerially important because the use of Im in the workplace continues to grow at a steady pace. Osterman Research (2006) predicted that by the end of 2009, almost 99% of organizations in North America would have adopted and used Im as one of their basic communication tools. From a practical perspective, a major implication of this study is that anticipated emotions and social influence are two of the most important determinants of participation in social network-facilitated team collaboration. In addition, gender diversity is apparent in the use of Im. Based on these findings, several useful guidelines may be developed.

First, the significance of both positive and negative anticipated emotions indicates that decision-making regarding the use of Im in social network-facilitated team collaboration is closely related to the expected results from usage behavior. Therefore, managers should present and demonstrate to employees some successful examples of using Im in team collaboration. In addition, managers should circulate information regarding the possible benefits from goal achievement and the possible loss arising from goal failure to team members who may use Im with co-workers in their professional social networks.

Second, the finding of study demonstrated that group norms and social identity play important roles in determining we-intention to use Im in social network-facilitated team collaboration. Therefore, people use Im to communicate and collaborate with others in their social networks mainly because they think it is congruent with their own goals or values and they want to develop satisfying self-defining relationships with their peers. In this regard, managers could emphasize the importance of Im in efficiently completing group task and ultimately improving team performance. In addition, managers could recommend some special features of Im, such as chat room and e-cards, to users to help them better manage their online relationships more easily and efficiently.

Third, gender difference reminds managers should adopt different strategies in promoting social network-facilitated team collaboration for men and for women. According to the results of this study, the effects of attitude, positive anticipated emotions and group norms are more salient for men. Therefore, managers should try to highlight the usefulness and effectiveness of Im in team collaboration and further demonstrate some successful case examples to men. On the other hand, the effects of negative anticipated emotions and social identity are more salient for women. Managers thus should nourish the confidence of women in the use of Im for social network-facilitated team collaboration and better cultivate a close relationship between women and other team members.

In summary, this study provides a good starting point and new insight into the main issues regarding we-intention to use Im in social network-facilitated team collaboration. As an important and interesting concept involved in social networking, 'we-intention' should deserve more attention in the future. We believe that this study would have the potential to contribute significantly to studies on Web 2.0 applications, especially in the context of using social networking platforms for team

collaboration. In addition, future research also should continue this line of research by investigating the pertinent issues in the context of some other widespread social networking websites, such as Facebook, Friendster and MSN Space.

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## Appendix A

### Questionnaire items

#### Attitude

Using instant messaging to communicate with the group of your friends would be: (7-point semantic scale)

(1) Foolish-Wise, (2) Harmful-Beneficial, (3) Bad-Good

#### Positive anticipated emotions

If I am able to use instant messaging to communicate with the group of my friends, I will feel: (7-point 'not at all-very much' scale)

(1) Excited, (2) Delighted, (3) Happy, (4) Glad, (5) Satisfied

#### Negative anticipated emotions

If I am unable to use instant messaging to communicate with the group of my friends, I will feel: (7-point 'not at all-very much' scale)

(1) Angry, (2) Frustrated, (3) Sad, (4) Disappointed, (5) Depressed, (6) Worried, (7) Uncomfortable, (8) Anxious

#### Subjective norms

- Most people who are important to me think that I should/should not use instant messaging to communicate with the group of my friends. (7-point 'should-should not' scale)
- Most people who are important to me would approve/disapprove of me using instant messaging to communicate with the group of my friends. (7-point 'approve-disapprove' scale)

#### Group norms

Using instant messaging to communicate with the group of your friends that you identified above can be considered as a goal. For you and your friends, please estimate the

strength to which each holds the goal. (7-point 'weak-strong' scales)

- Strength of the shared goal by yourself
- Average of the strength of the shared goal for other friends

#### *Social identity*

- Please indicate to what degree your self-image overlaps with the identity of the group of your friends with whom you communicate using instant messaging. (7-point 'not at all-very much' scale)
- How attached are you to the group of your friends with whom you communicate using instant messaging? (7-point 'not at all-very much' scale)
- How strong would you say your feelings of belongingness are toward the group of your friends with whom you communicate using instant messaging? (7-point 'not at all-very much' scale)
- I am a valuable member of the group. (7-point 'does not describe me at all-describes me very well' scale)
- I am an important member of the group. (7-point 'does not describe me at all-describes me very well' scale)

We-Intention (7-point 'disagree-agree' scale)

- I intend that our group use instant messaging to communicate together.
- We intend to use instant messaging to communicate together.

## Appendix B

Procedure for the comparison of path coefficients

$$S_{pooled} = \sqrt{\left\{ \left[ \frac{(N_1 - 1)}{(N_1 + N_2 - 2)} \right] SE_1^2 + \left[ \frac{(N_2 - 1)}{(N_1 + N_2 - 2)} \right] SE_2^2 \right\}}$$

$$t = (PC_1 - PC_2) / [S_{pooled} \sqrt{(1/N_1 + 1/N_2)}]$$

where  $S_{pooled}$  is the pooled estimator for the variance;  $t$  the  $t$ -statistic with  $N_1 + N_2 - 2$  degrees of freedom;  $N_i$  the sample size of data set for sample  $i$ ;  $SE_i$  is the standard error of path in structural model of sample  $i$ ;  $PC_i$  is the path coefficient in structural model of sample  $i$ .