To stick or not to stick: The social response theory in the development of continuance intention from organizational cross-level perspective

Jyun-Wei Huang [a,*], Chieh-Peng Lin [b]

[a] Graduate School of Institute of Business and Management, National Chiao Tung University, Taiwan
[b] Institute of Business and Management, National Chiao Tung University, Taiwan

ARTICLE INFO

ABSTRACT

The rapid growth of online social network sites (SNSs) has raised the research question of why people continue sticking to these sites. This study proposes a social network site stick model based on social response theory to answer this question. This study hypothesizes that group-level social capital (e.g., environmental prompt cues or social cues) positively influences arousal. Group-level social capital includes group-level social interaction, group-level social trust cues, and group-level social shared codes and language. Arousal subsequently induces users to engage in knowledge sharing and social support behaviors, which, in turn, leads to continuance intention. Empirical analysis using a survey of registered users from a popular social network site supports all of these hypothesized effects. Finally, this study discusses the managerial implications and limitations of these findings.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

Electronic commerce has experienced tremendous growth in recent years, and especially in social network-based applications. Social network sites (SNSs) have blossomed with the wave of Web 2.0 technologies (Kim, 2011). People primarily use SNSs for social supports, knowledge sharing, and interaction, and rarely for gathering information (Rau, Gao, & Ding, 2008). In SNSs, people are connected in a person-to-person manner, creating a more direct and interpersonal network than other online communities. The social interaction and interpersonal relationships among users of SNSs should have a salient influence on individual usage intentions. Information system (IS) continuance which reflects the likelihood that an individual will continue using IS in the future is also central to the survival of many business-to-consumer electronic commerce firms, such as Internet service providers (ISPs), online retailers, online banks, online brokerages, and the like. The effective subscriber base, market share, and revenues of these firms depend on both the number of initial adopters (new subscriptions) and the number of continued users (subscription renewals) (Bhattacherjee, 2001). However, previous studies in the field of information system (IS) continuance (i.e., continuance intention) have not paid attention to an enough level, due to the lack of systematic research on this topic (Larsen & Sørebø, 2009). Although publications addressing various aspects of IS continuance are gradually increasing (e.g., Fang & Chiu, 2010; Larsen & Sørebø, 2009; Thong, Hong, & Tam, 2006), this area remains somewhat undeveloped. Previous studies on IS continuance generally fall into three categories. The first category includes studies that use IS adoption as an antecedent of IS continuance to explain continuance use behavior (e.g., Lin, Wu, & Tsai, 2005; Roca, Chiu, & Martínez, 2006). The second category adopts usage trends over time to elucidate continuous use behavior based on the continuance theory (e.g., Kim & Malhotra, 2005). Studies in the third category describe continuous use behavior by integrating the originally proposed IS continuance theory (e.g., Bhattacherjee, 2001) with other complementary theories, such as technology acceptance model (TAM), theory of planning behavior (TPB), and post-acceptance model (PAM) (e.g., Kang, Hong, & Lee, 2009; Kang & Lee, 2010; Liao, Chen, & Yen, 2007; Sørebø & Eikebrokk, 2008). This study presents a fourth category that explains IS continuance through social response theory rather than the IS behavior model (e.g., TAM, TPB, PAM, etc.). Because the issue of IS continuance is more than a trivial theoretical notion, this study attempts to refine social response theory using a specific model to advance the literature and predict continuance intention. In common practice, IS continuance is more than a trivial notion because SNS vendors hope to provide enough traffic (e.g., click through rates or average visitor session lengths) for commercial advertisers to receive a commercial benefit. For example, advertisers hope that the users of these SNSs will purchase their products, post favorable remarks about their products on their web page, and provide them with useful information about consumer trends and preferences.

The social response theory proposed by Moon (2000) describes how social cues arouse user responses to information technology

* Corresponding author. Address: 4F, 118, Sec. 1, Jhongsiao W. Rd., Taipei 10044, Taiwan. Tel.: +886 2 23812386x57662.
E-mail addresses: cwhuang.bm97g@nctu.edu.tw (J.-W. Huang), jacques@mail.nctu.edu.tw (C.-P. Lin).

(IT) via a computer screen. Although previous social response theory studies examine how people apply social rules to respond to computers exhibiting human-like attributes (e.g., Reeves & Nass, 1996), they only include exploratory conceptualizations of the social response process. In other words, relatively few studies assess the social response process in an IT setting, especially in SNSs. To investigate user behaviors, this study draws from the interpersonal interactions into one kind of environmental prompt cues (or social cues), and discusses how this influences people to respond to the SNSs via screen of computer. In the field of information technology (IT), the use of humanlike or social cues on websites is one of the most exciting developments in human–computer interface applications, and has been rapidly adopted by website designers (Prendinger & Ishizuka, 2004). Companies such as iNago and Artificial Life have developed humanlike characters that use various social cues, and provide these characters to online retailers. This integration of social cues into websites can increase a user's perception of employee presence, and thus enhance the online experience. This study proposes a different mechanism for explaining the effects of social cues-rooted not in humanlike characteristics (e.g., human voice) but rather in group tone (e.g., group-level social capital). The group tone is conceptually very similar to group context or organizational climate, and refers to a set of norms, attitudes, and expectations that individuals perceive when operating in a specific social context or group (Schneider, 1990). In other words, this study draws social capital into group-level social capital from an organizational climate perspective (Schneider, 1975).

This study develops and tests an organizational cross-level model regarding the cross-level influences of individual perception and group context, and studies how the group context (group-level social capital) shapes the individual perception (individual-level arousal) from the person-situation interaction theory (Tett & Burnett, 2003). For example, how is group-level social capital displayed within a group viewed an ambient stimulus that pervades the within-group and shared among group members influence the individual-level arousal? In this study, group-level social capital is the overall pattern of social capital (e.g., social interaction, social trust, and social shared codes and language). This study effectively opens a new stream of literature on this topic by contributing to IS continuance research and by proposing an organizational cross-level focus. This study also shows how the group context shapes the expression of individual differences (perceptions), providing important initial evidence of the value of the cross-level approach in understanding how to induce individuals' affect to engage in the social behaviors (e.g., knowledge sharing and social support). Therefore, this study opens an important avenue for future social response research on social networks. By examining the emotional effects of group-level SI, ST, and SS in SNSs, this study fills a gap in human–computer interaction (HCI) research and responds to researchers' calls for more systematic investigations on how people make sense of virtually-presented others (Lee & Nass, 2003). Specifically, this study attempts to answer two research questions:

RQ1. What role does group-level social capital play in influencing users to engage in social behaviors and inducing continuance intention?

RQ2. How can the social response theory explain IS continuance?

2. Theory and development of hypotheses

The conceptual trickle down model in this paper (Fig. 1) hypothesize that group-level social capital positively influences arousal. Arousal subsequently induces users to engage in knowledge sharing and social support behaviors, which, in turn, leads

to continuance intention. The proposed model then illustrates a series of mechanisms to explain the social response process in continuance intention.

2.1. Social capital at group level

Prior research (Lin, 2011; Robert, Dennis, & Ahuja, 2008) suggested that in the field of social networks three social capital dimensions should be considered, which include a structural dimension (for example, social interaction), a relational dimension (for example, social trust), and a cognitive dimension (for example, social shared codes and language) (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). Although structural dimension (social interaction), relational dimension (social trust), and cognitive dimension (social shared codes and language) of social capital have their origin in individual-level analysis (e.g., Lin, 2011), they may form a shared, collective perception of group-level constructs (environmental prompt cues or social cues). Accordingly, in this section, this study draws social interaction (SI), social trust (ST), and social shared codes and language (SS) into group-level constructs through various studies and theoretical perspectives to provide the underpinnings for the emergence of SI, ST, and SS as a property at the group-unit-level.

First, it is reasonable to suggest that an analogous process occurs for group (or group level), in which particular events have an impact on a tacit understanding within the group (e.g., group-level social capital), which subsequently influences individual-level attitudes and behaviors (e.g., individual-level arousal) (Pirola-Merlo, Härtel, Mann, & Hirst, 1998). This statement requires that we are able to identify factors at the group level that are analogous to individual experience of events or attitudes and behaviors. Researchers have identified such constructs at the group level. Group have been conceptualized as social entities that, over time, develop a history of shared experience (Härtel, Härtel, & Barney, 1998), and like individuals, groups have been shown to develop shared attitudes and behavioral patterns or norms through experience/events (Anderson & West, 1998; Härtel et al., 1998). For example, George (1990) described an attitude shared by the group as "group tone" arguing that this construct is meaningful when group members experience similar sense states within group. Group tone is conceptually very similar to group context, referring to a set of norms, attitudes, and expectations that individuals perceive while operating in a specific social context (Schneider, 1990). Similar to group context, group-level constructs in our study (e.g., group-level SI, ST, and SS) refer to group tones (or context). It is suggested that the influence of group context (e.g., group-level social capital) has a cross-level effect on the relationships among individual-level constructs (e.g., arousal), where group context is a group-level constructs (e.g., group-level SI) (Johns, 2006). Contextual variables at the group-level are usually derived by aggregating the responses of individual group members (Susser, 1994). According to the theme of emergent processes from a multilevel perspective (e.g., Kozlowski & Klein, 2000), an aggregated variable represents shared perceptions of a group environmental context at the group-level capturing a different construct, not just the sum of the individual perceptions of the group environmental context (Firebaugh, 1978).

Second, SI, ST, and SS have been proposed as properties of the group-level. For example, Steinfield, Ellison, and Lampe (2008) stated "It is important to distinguish between conceptions of social capital at the individual and relationship level, and conceptions at the community level" (p. 436) and found that social capital could indeed be conceptualized as contextual variables. Second, Robert et al. (2008) demonstrated a group-level measure of relational dimension of social capital (social trust). They aggregated individual-level relational dimension of social capital into group-
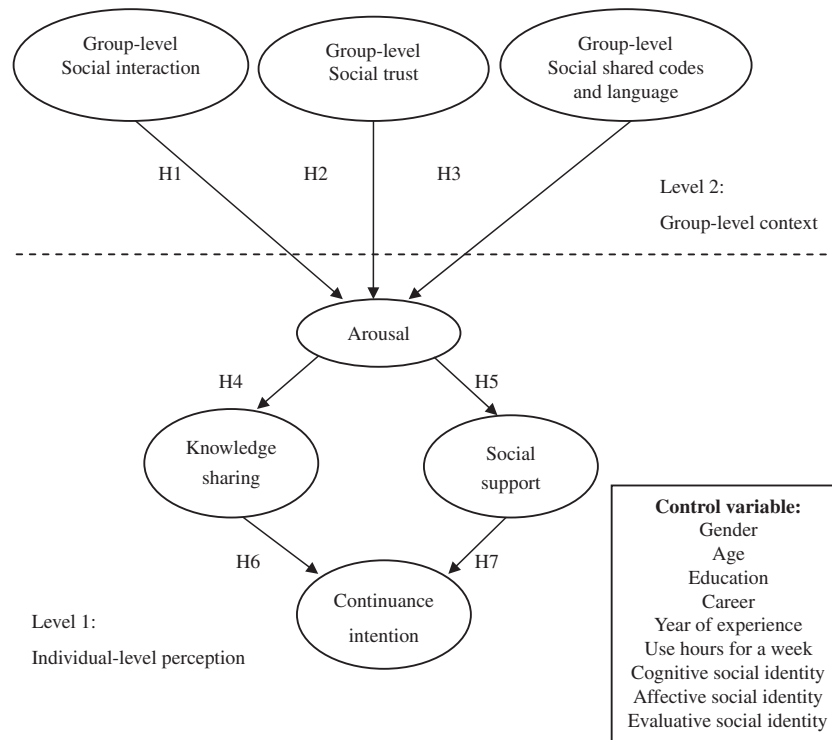
Fig. 1. The framework of this study.

level relational dimension of social capital based on organizational multilevel method (Kozlowski & Klein, 2000).

The implications of these studies and the above discussion are twofold. First, they suggest that social capital needs to be studied in its social context, which is characterized by relational phenomena that cannot be in terms of independent individuals (Cappelli & Sherer, 1991). For individuals interacting with members in SNSs, perhaps the most prominent social context is the group (e.g., Hackman, 1992). This emergence process has been referred to as a bottom-up process in multilevel research (Kozlowski & Klein, 2000). We borrowed from three perspectives to provide the underpinnings for the emergence of social capital as group-level property. The first perspective is social information processing theory (Salancik & Pfeffer, 1978) which states that individuals use information gathered from others in their direct social contexts to form judgments about organizational practice and value. Given that members of the same group are exposed to the same contextual characteristics (Naumann & Bennett, 2000), they may possess shared information and form common perceptions regarding the social capital and procedures in the group. Second, based on socialization, a new joining member will come to learn, via interactions with existing members. This type of information exchange occurs among members in the same group, thereby fostering the formation of relatively homogeneous social capital perception in the group (e.g., Louis, Posner, & Powell, 1983; Ostroff & Kozlowski, 1992). Third, the attraction–selection–attrition perspective (Schneider, 1975), which states that individuals of similar characteristics are attracted to, selected into, and retained by the same group, also supports that over time, a work group will consist of individuals of similar social capital values and perception. Finally, empirical research has shown the influences of these hypothetical processes in the formation of specific climates at the group level, such as the innovation climate (e.g., Anderson & West, 1998), the safety climate (e.g., Hofmann & Stetzer, 1996), and the procedural justice climate (e.g., Naumann & Bennett, 2000). In sum, the above theories and empirical evidence support the use of the group as an appropriate level to examine the existence of perceptions of group-level SI, ST, and SS shared perceptions among group members (environmental prompt cues). In addition, our group-level perspective of SI, ST, and SS is a supplement to the knowledge in the social capital literature by confirming social capital as group-level variables. This approach is also consistent with the contextual model (Firebaugh, 1980), which supports the justification to aggregate individual-level SI, ST, and SS into group-level SI, ST, and SS (or environmental prompt cues).

2.2. Social response theory

According to the social response theory (Moon, 2000), people tend to treat computers as social actors rather than a medium even when they know that computers do not possess feelings, selves, or human motivations (Nass & Moon, 2000). More specifically, when presented with IT possessing a set of human characteristics (e.g., interactivity), people follow social rules or social behaviors when responding to computers that exhibit human-like attributes or giving social cues (Reeves & Nass, 1996). Many of the social conventions among interpersonal behaviors (e.g., human–human interactions) also appear in HCI, even when the conventions no make rational sense in different contexts (Reeves & Nass, 1996). Some of these conventions include politeness (Nass, Moon, & Carney, 1999), reciprocity (Moon, 2000), interdependency among group members (Nass, Fogg, & Moon, 1996), interaction between similar and dissimilar personalities (Nass, Moon, Fogg, Reeves, & Dryer, 1995). This somewhat that people develop relationships with computers that are psychologically similar to relationships with the person behind the computer.

The theoretical explanation for this social response process is that humans are social animals, and are therefore socially oriented (Nass & Moon, 2000). Substantial psychological evidence indicates that people tend to use a variety of heuristics to avoid extensive information processing (i.e., adopt a lazy information processing) (Chaikin, 1980; Eagly & Chaiken, 1993). Thus, mindlessness is a

reason for these responses (Nass & Moon, 2000), which occur as a result of unconscious attention to a subset of contextual cues (e.g., human-like interaction). These responses then trigger various social scripts and expectations in accordance with people's prior experiences. When a computer exhibits social cues, people tend to respond automatically to a computer using their own simplistic social scripts (e.g., using information sharing to respond to computer). This is because they assume that a persons' orientation is toward the most proximate source of information (Sundar & Nass, 2000), such as screen of a computer in front of a user's eye.

This study extends social response theory to the context of SNSs, and proposes that users interacting with SNS group members may respond positively to group-level social capital (environmental prompt cues or social cues) embedded in within-group interactions. Steuer and Nass (1993) suggested that two social cues are particularly relevant to elicit social responses to respond to computer: interaction cues and language cues. Boone, Declerck, and Suetens (2008) suggested that trust is an important social cue within an organization, as it elicits people's social responses to other organization members.

Liu and Shrum (2002) suggested that interaction consists of active control and two-way communication, and that two-way communication is a key characteristic of interpersonal communication. Ha and James (1998) found that the user–machine interaction resembles interpersonal communication, the more interactive people considered the communication to be. Likewise, McMillan and Hwang (2002) argued that a person's perception of two-way communication is a requirement for internet interactions to occur. Because SNSs are designed to resemble the two-way responses typical of human interpersonal interactions, individuals should respond to the computer as if it was a social actor. Because SI represent close relationships, time in spent in interacting, and frequent communication (Nahapiet & Ghoshal, 1998), they can serve as a measure of the first role of social cue-group-level SI (or SI cue).

Trust elicits responses to the computer as social actor. The social development literature argues that trust is the most important social cue in interpersonal relationships (Boone et al., 2008). Since SNSs are rooted in interpersonal relationships, individuals who perceive high social trust (environmental prompt cues) within a group should also respond to the computer as if it was a social actor. ST represents an individual's belief in other members, including promise keeping, behavior consistency (Nahapiet & Ghoshal, 1998). These factors determine the second role of social cue-group-level ST (or ST cue).

Language cues refer to the text displayed on the computer screen. Turkle (1984) found that children think that computers are alive because they display human language on the screen. Moon (2000) demonstrated that humans and computers engage in intimate self-disclosure exchanges when the language on the computer is entirely text based. Nass et al. (1995) found that using strong or weak language in the text displayed on the screen of computer successfully created the perception of dominant and submissive computer personalities. Because SNSs incorporate language in the form of written text, individuals should also respond to the computer as if it is a social actor. SS represents common terms, meaningful communication patterns, and message understandability (i.e., language or text) (Nahapiet & Ghoshal, 1998). Thus, these factors determine the third role of social cue-group-level SS (or SS cue).

HCI may elicit social responses from even the most technologically astute users (Reeves & Nass, 1996). This suggests that group-level SI, ST, and SS (environmental prompt cues) cause people to engage in social behaviors based on a social response perspective rather than curiosity about new technologies (or services).

In summary, social response theory posits that users may respond to SNS computer screens that exhibit social cues (e.g.,

group-level SI, ST, and SS) in much the same way they would respond during human–human interactions. For example, when a person perceives that social interaction cue is pervaded in his within-group and shared among his group members (group-level social interaction), this interaction tone (stimulus) acts as a social cue (or environmental prompt cue) that causes him to engage in social behaviors when responding to SNSs. Therefore, this study proposes a trickle down mechanism that describes how people apply social behaviors (e.g., knowledge sharing and social support) when responding to SNS, which, in turn, induces continuance intention.

2.3. Research framework and development of hypotheses

In the research model proposed in this study (Fig. 1), continuance intention is simultaneously influenced by the knowledge sharing and social support and these two social behaviors are brought from the social response mechanism. Thus, group-level SI, ST, and SS will trigger peoples' social behaviors. The following discussion provides the theoretical rationale and justification for the hypotheses in this study.

Based on previous human emotion studies, Zaltman (1995) stated that peoples' emotions (arousal) significantly contribute to decision making and are therefore essential components. These findings are supported by a research stream showing that emotion is a key contributor in human response (e.g., Gardner, 1985; Wyer & Srull, 1989). To determine the role of emotion, this study draws on the "stimulus-organism-response" (SOR) framework (Mehrabian & Russell, 1974) and cognitive mediation perspective, which state the rapid and unconscious perceptions precede affective response (Kaplan, 1987). Previous studies indicate that environmental prompt cues are a preliminary factor in determining intentional or unintentional psychological behavior processes (Clitheroe, Stokols, & Zmuidzinas, 1998; Mehrabian & Russell, 1974). Thus, the group-level SI, ST, and SS are served as environmental prompt cues for users in SNSs. For example, when a person perceives that SI, ST, and SS are displayed to the within-group, and can be viewed as types of ambient stimulus that pervade the within-group and shared among group members, these SI, ST, and SS tone (stimulus) acts as a social cue (or environmental prompt cue) that causes him to engage in social behaviors when responding to SNSs. Based on the SOR framework, previous studies suggest the notion that stimuli in the physical environment influence peoples' affective arousal in bricks-and-mortar stores (Baker, Grewal, & Levy, 1992) and online environments (Davis, Wang, & Lindridge, 2008). Berry, Carbone, and Haeckel (2002) suggested that the cues people emit are an important component of emotion that influence peoples' experiences. Reeves and Nass (1996) suggested that including more social cues in the HCI setting would increase the social volume (e.g., individual emotion). In other words, group-level SI, ST, and SS (environmental prompt cues or social cues) may increase the arousal level of users.

In summary, based on the macro-level properties that influence and constrain lower level phenomena (Kozlowski & Klein, 2000), group-level SI, ST, and SS may have top-down influences on members' individual-level arousal in the group-level context. This suggests the following statements:

H1. Group-level social interaction is positively related to individual-level arousal.

H2. Group-level social trust is positively related to individual-level arousal.

H3. Group-level social shared codes and language is positively related to individual-level arousal.

The social response theory states that people may adopt social behaviors when responding to a computer when they interact with group members in SNSs due to the stimulus of group-level SI, ST, and SS. However, the mechanism of how social cues trigger peoples' intentions to engage in social behaviors remains unclear (e.g., Moon, 2000). This study adopts the SOR framework to explain this mechanism in detail, and proposes that individual arousal plays a mediating role between group-level SI, ST, and SS and social behaviors (e.g., knowledge sharing and social support) in the social response mechanism.

Because information sharing is a kind of extensive behaviors in online communities, this study divides it into emotional information sharing (i.e., social support) and facilitation information sharing (i.e., knowledge sharing). Note that although human–human interaction includes many social behaviors, previous research on interpersonal interactions shows that agency (i.e., knowledge sharing) and communion (i.e., social support) are the two most salient dimensions (Cutrona & Suhr, 1994; Horowitz, Krasnoperova, Tatar, Hansem, & Person, 2001). Knowledge sharing is defined as the degree to which a member shares knowledge to facilitate action, such as giving advice or information each other; those forms bend on helping the person perform some act to enhance the persons' efficacy. Social support includes behaviors that focus on compassion to help a person regulate internal emotional distress, such as helping a person feel loved, accepted, or understood. This study defines these two social behaviors in SNSs as enhancing the persons' competence or efficacy and showing compassion to help a person regulate internal emotional distress.

Behaviors such as knowledge sharing and social support frequently appear in virtual communities in the form of extensive information posting and viewing (e.g., Butler, 2001; Eastin & LaRose, 2005; Kuo & Young, 2008; Lin, Huang, & Chen, 2009). Previous studies indicate that social capital may influence information sharing (Lin, 2011; Nahapiet & Ghoshal, 1998). In other words, when people receive group-level SI, ST, and SS (environmental prompt cue), they may also use knowledge sharing and social support to respond to SNS group members via computer. For example, Butler (2001) indicated that frequent online interactions can provide a higher level of social support. Thus, when people frequently interact with SNS group members, based on the social response perspective, individual arousal may induce people to engage in knowledge sharing and social support behaviors. Therefore, this study proposes the following hypotheses:

H4. Individual arousal is positively related to knowledge sharing.

H5. Individual arousal is positively related to social support.

This study adopts three theories to connect knowledge sharing and social support with continuance intention. First, previous research on the theory of cognitive integration (Sethi & King, 1999) indicates that the valuation and integration of knowledge sharing may cause the continuance intention (He & Wei, 2009). For example, when people apply knowledge sharing to interact with members in SNSs, they may produce various informational values or integrate different knowledge to form new knowledge, which is an antecedent of continuance intention (He & Wei, 2009). Second, previous empirical research based on self-determination theory shows that social support is related to continuance intention (Roca & Gangné, 2008). Finally, transaction cost theory suggests that knowledge sharing and social support activities are a kind of psychological investment (e.g., taking time to gather information or to give advice to friends in SNS) that may make people want to maintain long-term relationships with SNS group members. Thus, people may continue using SNS due to the investment of engaging in information sharing activities in the past.

This study proposes that knowledge sharing and social support are positively associated with continuance intention, and suggests the following hypotheses:

H6. Knowledge sharing is positively related to continuance intention.

H7. Social support is positively related to continuance intention.

3. Methodology

3.1. Subjects and procedures

The empirical sample was obtained by management employed masters students from Taiwan's public university. The use of student subjects is justifiable when the goal is not to generalize results but to test a theory (Calder, Phillips, & Tybout, 1981). We used an address book as our sample list, and then emailed employed master students an invitation to participate in the survey by filling out our online questionnaire on the website; follow-up reminders were also sent via e-mail. Books coupon worth around US$3.3 was provided as incentives to each survey respondent. Three-hundred subjects were requested to participate in this academic study and each subject was asked to recruit over ten friends from Facebook who frequently interact with others (e.g., frequently leave a message on a scrawl board on Facebook). Of these, we obtained 104 employed masters students to be our peers for each group. Note that the peer in each group was reminded to request their invited friends to join their group when they responded. After removing the three cases for which the recruitment responses in the group were lower than two, the sample included 1101 different responses from 101 groups for a response rate of 33.7%. On average, each group had 11 members (ranging from 8 to 15) and interacted for at least 3 h per week. The sample characteristics included gender (56.34% were female), age (half responses were above 31), education (53% were graduate school), occupation (41.7% were information technology and no full time student), years of experience (92% were above 1 year), and hours of use for a week (77.8% were above 11 h).

To test for the common method bias, this study referred to the research of Podsakoff, Mackenzie, and Lee (2003), and was based on four areas for mitigating and detecting common method bias. First, this study investigated respondents without obtaining their names to reduce their suspicion or hesitation to fill out the questionnaire factually. More specifically, respondents were assured of complete anonymity in the cover letter confirming that neither their personal name nor the name of their organization would be disclosed. Second, we inserted a few items unrelated to our constructs (for example, "It is unlikely for me to stop using Facebook"), neutralizing the social desirability bias of the respondents. Third, this study used the tenure of respondents as the marker variable (Malhotra, Kim, & Patil, 2006) because it is theoretically unrelated to the constructs examined in this study. Finally, the one-factor test of Harman (Podsakoff et al., 2003), with the test results showing that the variances are not distributed unevenly among multiple factors, suggested that potential common method bias is not a threat in this study for our subsequent analysis.

3.2. Measures

We employed the 7-point Likert scales to measure the variables in our framework drawn and refined from literatures. A pilot test is conducted to refine our scales for validity, including three doctorial, four EMBA students and a senior IT designer whose are professional in IT setting and behaviors. Then, backward translation was

applied to compare an English version questionnaire to a Chinese one (Reynolds, Diamantopoulos, & Schlegelmilch, 1993) and therefore the scales consistency is confirmed.

To measure group-level constructs, we used a within-group consensus at the lower level as a precondition for making high-level constructs operational as an aggregation of individual-level measures. It is important to note that we employed a referent-shift model (Chan, 1998) to measure group-level social capital constructs. Because group-level constructs are elements of the social system or work unit, rather than the individual, this difference is reflected in the shift in referent from the individual to the collective (e.g., group level). The referent-shift consensus model uses individual responses to measure group-level constructs in group units. In assessing group-level constructs using the referent-shift consensus model, the respondents were asked to describe the behavioral expectations and normative beliefs of the individuals in the group unit of the respondent. The focus was on what the individual believed were the expectations and norms of individuals in the group unit rather than what the individual respondent believed was personally expected of him or her. Within-group consensus was then required to justify the aggregation of individual beliefs concerning behavioral expectations and norms within the group unit as a representation of group-level constructs. In the absence of within-group consensus (e.g., James, Demaree, & Wolf's (1984) $r_{wg} < 0.7$), individual responses cannot be "composed" with regard to group-level constructs, because a lack of consensus suggests that common expectations and norms have not been identified. For example, SI at the individual level-represented by a value of 0.70 or above on r_{wg} index of within-group consensus-is a prerequisite for calculating group-level SI as the group-level mean of the individual responses to the SI measure, which is similar to measuring organizational climate (James et al., 1984). When there is consensus and the SI is shared by members of a group, the aggregation composes a construct at the group-level.

3.2.1. Social capital

The three dimensions of social capital are the group-level constructs. We refer to the domain based on Tsai and Ghoshal (1998) and Nahapiet and Ghoshal (1998) to develop our social capital scale. The social interaction focus on close relationship, time in spent in interacting, and frequent communication (Tsai & Ghoshal, 1998). Next, the social trust is assessed with individual belief in other members, including promise keeping, behavior consistency, and truthfulness (McKnight, Choudhury, & Kacmar, 2002; Nahapiet & Ghoshal, 1998; Ridings, Gefen & Arinze, 2002). Finally, the social shared codes and language was measured with items adapted from Nahapiet and Ghoshal (1998), including common terms, meaningful communication pattern, and message understandability (please see Appendix A).

3.2.2. Arousal

We adapted Mehrabian and Russells' (1974) scales to measure affective responses to members of groups in Facebook.

3.2.3. Knowledge sharing and social support

In measuring this two constructs, this study refers to the domain based on Cutrona and Suhr (1994) scale which categorized the various types of information support into two broad categories, including the knowledge sharing and social support, and this two dimensions have been identified as the salient interpersonal behaviors (Horowitz et al., 2001). The agency is that facilitates over action, such a giving advice, helping the people perform some act in order to enhance the persons' sense of competence or efficacy. This study parallels this category as "knowledge sharing". The other category contains form that bend on helping the person feel emotion, accepted, or understood and it focus on compassion to help the person regulate internal emotional distress. We parallel this second category as "Social support".

3.2.4. Continuance intention

The continuance intention was measured using four items adapted from Bhattacherjee's (2001) scale to measure the IS continuance intention.

3.2.5. Control variable

Accounting for the hetergeneity of the samples, we controlled for gender, age, education, career, year of experience, use hours for a week. On the other hand, the three social identity constructs (i.e., cognitive social identity, affective social identity, and evaluative social identity) were also adopted to control for individual different (Ellemers, Kortekaas, & Ouwerkerk, 1999), since the social identity is the salient factor to determinate people to engage in social behaviors or intention to use (Bagozzi & Dholakia, 2002).

3.3. Data analysis

The survey data were analyzed in two stages. In the first stage, this study performs confirmatory factor analysis (CFA) on all collected data to assess scale reliability and validity. However, our framework involves the cross-level variables (e.g., individual-level arousal and group-level SI, ST, and SS), the multilevel factor analysis was also employed to test multilevel data structure. We used the Dyer, Hanges, and Hall' (2005) multilevel CFA procedures to assess the data. The second stage examines construct relationships and significances in the proposed hypotheses by hierarchical linear modeling (HLM) based on the random coefficient model. Empirical results from each stage of analysis are presented next.

3.3.1. Validation of multilevel data structure

The confirmatory factor analysis (CFA) and the multilevel CFA (Dyer et al., 2005) were employed to confirm the validity of the constructs in our framework. Due to the nested structure of organizational context (for example, individual- and group-level variables), the hierarchical linear modeling (HLM) based on the random coefficient model was employed to test each hypothesis.

Due to the multilevel variables in our framework, we employed the Intraclass correlation coefficients and $r_{wg(j)}$ to detect the reasonableness and justification for aggregating the three aspects of group-level social capital (group-level social interaction, social trust, and social shared codes and language). Based on the one-way analysis of variance, the three group-level social capital variables significantly differed between groups. Intraclass correlation coefficients were all above the critical value (ICC1 > 0.2 and ICC2 > 0.7) for the three social capital variables of group-level and were justified to aggregate constructs (for example, the minimal ICC1 and ICC2 among the three social capital climates are 0.58 and 0.93, respectively) as suggested by prior research (Bliese, 2000). Furthermore, the minimum and mean $r_{wg(j)}$ were 0.85 and 0.91, respectively, both above the critical value of 0.7 (James et al., 1984). The aggregation of social interaction, social trust, and social shared codes and language into group-level social interaction, social trust, and social shared codes and language were justified.

Next, confirmatory factor analysis (CFA) was performed on all of the items corresponding to the seven constructs. Table 1 provides the fit of the model, factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) for these constructs. All factor loadings for indicators measuring the same construct were all statistically significant (the minimal t-value = 24.20). The discriminant validity was then confirmed by the chi-square difference test, and the result assured the discrimi-

Table 1
Standardized loadings and reliabilities.

Construct (individual-level)	Indicators	Factor loading	CR	AVE	Cronbach's α
Social interaction	INT1	0.77**	0.74	0.49	0.79
	INT2	0.76**			
	INT3	0.72**			
Social trust	TRU1	0.77**			
	TRU2	0.74**	0.75	0.50	0.83
	TRU3	0.69**			
	TRU4	0.78**			
Social shared codes and language	SHA1	0.75**	0.76	0.51	0.83
	SHA 2	0.81**			
	SHA 3	0.79**			
Arousal	ARO1	0.69**	0.79	0.49	0.80
	ARO2	0.70**			
	ARO3	0.71**			
	ARO4	0.70**			
Knowledge sharing	SHA1	0.78**	0.86	0.60	0.89
	SHA2	0.83**			
	SHA3	0.81**			
	SHA4	0.81**	0.88	0.64	0.90
Social support	SUP1	0.80**			
	SUP2	0.85**			
	SUP3	0.88**			
	SUP4	0.85**			
Continuance intention	CON1	0.89**	0.87	0.63	0.91
	CON 2	0.83**			
	CON 3	0.82**			
	CON 4	0.81**			

Goodness-of-fit indices: χ^2_{155} = 295.84; GFI = 0.98; RMSEA = 0.007; NFI = 0.98; RMR = 0.04; CFI = 0.99.

** $p < 0.01$.

nate validity for the constructs in our study. Confirmation of the convergent and discriminant validity of the constructs provided a sufficient basis to test the multilevel CFA (Dyer et al., 2005). The method used the individual- and group-level variables simultaneously at both levels, and the results for group-level social capital variables showed that the model fitted well (χ^2 = 200.36, d.f. = 155, RMSEA = 0.05), supporting the validity in group-level constructs. Collectively, on the basis of these results, the measurement model in our study fits well with the data, assuring reliability and validity.

3.3.2. Analysis and model development

Due to cross-level examination in our data structure, multiple users were nested within a single group. The HLM, which accounts for the lack of independence across different groups and structure of cross-level variables (Raudenbush & Bryk, 2002), was employed as our statistical technique to test cross-level hypotheses. To avoid multicollinearity, variables were mean centered and then put into the HLM model. This study relates the group-level social interaction cue, social trust cue, and social shared code and language cue to the individual-level arousal using random slope mode of the HLM to test the cross-level effect. Table 2 shows the results of the HLM estimation for each model. First, the empty model with only the intercept terms indicates that adding a random intercept effect at the group-level significantly improves the model fit ($\triangle$ deviance = 220.54, $p < 0.01$). An empty model was used to test the significance of the between-group variance in the outcome variable (arousal) by the residual variance of the intercept. The analyses showed that the random disturbance term U_0 of the intercept is significant ($p < 0.001$), revealing that the context situations (different between-group variance) should be handled in our empirical data using the HLM technique.

3.3.2.1. Cross-level results.
We fist estimated the random slope model including level 2 variables (the three group-level social capital) in the HLM to assess the cross-level effect of group-level SI, ST, and SS on individual-level arousal. The Model 1 explains 31% of the variance in arousal, and group-level social interaction cue ($\gamma = 0.28$, $p < 0.01$), social trust cue ($\gamma = 0.35$, $p < 0.01$), and social shared code and language cue ($\gamma = 0.22$, $p < 0.05$) significantly relate individual-level arousal. The results are presented as Model 1 in Table 2. The results revealed that the Hypotheses 1, 2, and 3 are supported. The Hypotheses state that the group-level SI, ST, and SS arouse the arousal of individuals based on social response theory.

3.3.2.2. Individual-level results.
We estimated the random slope model in the HLM to test the nested structure in individual-level variables. On the basis of the results in Model 2 and Model 3 of Table 2, individual-level arousal is significantly related to knowledge sharing ($R^2 = 0.47$, $\gamma = 0.46$, $p < 0.01$) and social support ($R^2 = 0.46$, $\gamma = 0.22$, $p < 0.05$) to support Hypotheses 4 and 5. On the basis of the two supported hypotheses, we can conclude that the trickle down mechanism which group-level SI, ST, and SS arouse the arousal of individual, which, in turn, induce social behaviors (i.e., knowledge sharing and social support) based on social response theory is supported. Finally, the Model 4 explained 68% of variance in continuance intention, and the coefficients of knowledge sharing ($\gamma = 0.45$, $p < 0.01$) and social support ($\gamma = 0.39$, $p < 0.01$) were both significant to support Hypotheses 6 and 7. The Hypotheses state that the two salient interpersonal behaviors can predict continuance intention well.

4. Discussion

This study illustrates how social response theory can be extended to social network sites to explain continuance intention. This study is one of the first to extend the social response theory to explain the continuance intention from organizational cross-level perspective. The proposed trickle-down model is a salient model in previous IT research, and continues to provide an adequate explanation of individuals' IT usage based on the social behaviors in SNSs.

4.1. Implications for research

The results of this study support the social response hypothesis that the group-level SI, ST, and SS are important predictors of individual-level arousal to engage in social behaviors. Previous empirical researchers tend to re-use established models based on continued information system use (continuance intention), such as the extension TAM model (Roca et al., 2006), combined TPB with PAM model (Liao et al., 2007), and the combined task technology fit model with PAM model (Larsen & Sørebø, 2009), they often fail to consider the underlying nature and group context at rough macro-level (group-level) perspective. This study suggests that this "one size fits all" approach to modeling continued information system use may provide a less than adequate understanding of continued information system use for understanding the online interaction behaviors of users. This study demonstrates that the social response theory in the organization context perspective is so unique that traditional IS models have not adopted it. The model proposed in this study become more important as the scope and role of the online social interaction behaviors in a group increase. This also explains why SNSs (e.g., Facebook, Plurk, Twitter . . . etc.) have become so popular in our lives.

Since two key studies (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998) first addressed the concept of social capital, subsequent studies have applied the social network perspective to organizational relationships (Robert et al., 2008), how to build organiza-

Table 2
Test results of hierarchical regression models.

Level and variable	Arousal (Null model)		Arousal (Model 1)		Knowledge sharing (Model 2)		Social support (Model 3)		Continuance intention (Model 4)	
	γ	t-ratio	γ	t-ratio	γ	t-ratio	γ	t-ratio	γ	t-ratio
Intercept	3.13	45.70	0.22	1.86	3.13**	47.58	2.92**	9.14	0.61	4.43
Control variable										
Gender			0.02	0.72	0.03	0.63	0.01	0.13	0.05	1.16
Age			−0.03	−1.82	0.01	0.43	0.01	0.52	−0.04*	−2.14
Career			−0.01	−0.52	−0.01	−0.51	0.11*	2.34	−0.02	−0.36
Education			0.68	1.91	−0.04	−1.03	−0.03	−1.10	0.01	1.30
Year of experience			0.05	1.80	0.08*	2.41	−0.02	−0.72	0.03	0.97
Use hours for a week			−0.03	−1.57	−0.03	−1.45	−0.02	−0.91	−0.01	−0.12
Cognitive social identity			−0.01	−0.46	−0.02	−0.61	−0.01	−0.16	0.01	0.10
Affective social identity			−0.06	−1.82	0.02	0.47	0.03	0.79	−0.01	−0.32
Evaluative social identity			0.09**	2.80	0.05	1.01	−0.03	−0.61	0.01	0.04
Level 1 variables										
Arousal					0.46**	8.57	0.22*	2.40		
Knowledge sharing									0.45**	16.98
Social support									0.39**	9.73
Level 2 variables										
GSI			0.28**	3.06						
GST			0.35**	3.55						
GSS			0.22*	2,.04						
n (Level 1)	1101	1101	1101	1101	1101					
n (Level 2)	101	101	101	101	101					
Model deviance	2177.46	1956.92	2657.78	2702.66	2537.54					
R^2		0.31	0.47	0.46	0.68					

Note: GSI = group-level social interaction; GST = group-level social trust. ; GSS = group-level social shared codes and language.
* $p < 0.05$.
** $p < 0.01$.

tional social capital through technology (Sherif, Hoffman, & Thomas, 2006), and integrating the social capital and social cognition theories (Huang, Lin, & Lin, 2009). However, the current study is the first to draw social capital into organizational cross-level perspective to explain how individual behaviors are sculpted by group-level social capital in each within-group. According to the social response theory, individual-level arousal is induced by the group-level SI, ST, and SS (environmental prompt cues). These, in turn, induce individuals to engage in knowledge sharing and social support behaviors in SNSs. This cross-level mechanism is also supported by trait activation theory: a group context (e.g., group-level social capital) may bring out-activate-individual dispositions when the contextual impact is related to those dispositions (Chen & Kanfer, 2006; Tett & Burnett, 2003). These two social behaviors explain why people continuously use SNSs ($R^2 = 0.68$).

The findings of this study support that hypothesis that user knowledge sharing and social support behaviors are not arbitrary, but rather based on key environmental prompt cues, such as group-level SI, ST, and SS.

Finally, SNSs have recently become a popular application, probably more than traditional instant interactive IT or online forums. The scrawl board is a good example of social network interaction. It requires no instant interaction, but allows friends to leave a brief message. In other words, social network sites combine instant interactive IT with online forums in social network, and add other social interaction services programs (e.g., FarmVille) to allow people to interact further. The proposed model sheds light on previous IT studies, revealing the thinking of users and what services social network sites can provide to increase continuance intention. The proposed model can encourage future IT researchers to consider how to creatively tailor and extend generic behavior models, such as TAM, TTF, and PAM to better explain continued information system usage based on social interaction behaviors in the virtual context of SNSs.

4.2. Implications for practice

The findings of this study have several implications for promoting continuance intention. First, given the significant effect of group-level SI, ST, and SS on individual arousal, the managers of social network sites or vendors interested in interactive IT service should learn how to develop their sites. For instance, because users may play online interaction games (e.g., FarmVille) to enhance their within-group interactions, vendors should develop games or services that provide social capital content to promote user interaction. Second, based on the significant effect of individual arousal on knowledge sharing and social support, SNS vendors should include this factor in website design. Because sharing information may need much material information, vendors should develop database services such as "Yahoo! Answers" to allow users to engage in information sharing activities easily. As social interaction behaviors grow vigorously on SNSs, this would encourage many users to remain involved in the sites. A huge number of users would in turn allow the vendor to develop more commercial activities and earn more benefits. For example, SNS service providers use increasing network externalities to achieve economies of scale to propagate their business models, whereby SNS vendors can provide high enough traffic for commercial advertisers to receive a commercial benefit. Finally, the strong effect of social behaviors on continuance intention suggests that IT vendors should tailor their sites to users' social interaction activities, instead of developing advanced technological features in the IT system.

4.3. Limitations of the study

The empirical findings of this study should be interpreted in light of its limitations. The first limitation of this study is its cross-sectional research design. It may take time for consumers to develop their social behaviors, and a cross-sectional snapshot

of that process may only partially explain the complex and dynamic interrelationships between the different cognitions related to continuance intention. To determine whether the constructs and model paths proposed in this paper are valid over time, future research should employ longitudinal research designs.

The second limitation is that this survey was conducted using online questionnaires without random sampling. Although online surveys are a common method of surveying in online research, the sampling in this study may restrict the generalizability of these results to people who are not members of the subject website.

Third, while this study treats group-level SI, ST, and SS as social cues in the social response process, there may be other potential cues may arouse the individual arousal. Different cues may influence how individuals respond to the social network size. Thus, future research should include empirical comparisons across various cues.

The fourth limitation of the study is its generalizability, due to the highly delimited nature of the subject sample. Although the selection of management employed masters students from Taiwan's public university was governed partly by the popularity of Facebook among the student population and the ease of accessing student subjects, inferences drawn from such a limited sample may not be fully generalizable to workplace users, users of other age-groups, or users from other countries. Cultural psychologists suggest that national cultural differences may influence the perceptions and intention of on-line users (Crotts & Erdmann, 2000). Clearly, further research is needed in other settings (e.g., the workplace) and in other national cultures to examine the generalizability of the findings.

Finally, after several decades of controversy over the role of norms in predicting behavior, the research has clearly established that social norms not only spur but also guide action in direct and meaningful ways (Aarts & Dijksterhuis, 2003; Goldstein, Cialdini, & Griskevicius 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Therefore, in addition to the social behaviors proposed in this study, other kinds of social behaviors or norms may be relevant to continuance intention, which remains a topic for future research.

Appendix A. Measurement items

A.1. Group-level social interaction

In [Facebook], . . .

1. I feel that my friends mean to maintain close social relationships with each other.
2. I feel that my friends mean to spend a lot of time interacting with each other.
3. I feel that my friends mean to frequent communication with each other.

A.2. Group-level social trust

In [Facebook], . . .

1. I feel that my friends mean to keep the promises to each other.
2. I feel that my friends know we can count on each other.
3. I feel that my friends behave in a consistent manner.
4. I feel that my friends are truthful in dealing with each other.

A.3. Group-level social shared codes and language

In [Facebook], . . .

1. I feel that my friends use common terms or jargons to convey message each other.

2. I feel that my friends use understandable communication pattern during the discussion.
3. I feel that my friends use understandable narrative forms to post articles or messages (i.e. image, pictures, or music).

A.4. Arousal

1. I feel stimulated about using Facebook.
2. I feel aroused about using Facebook.
3. I have a frenzy of joy about using Facebook.
4. I feel excited about using Facebook.

A.5. Knowledge sharing

In [Facebook], . . .

1. My friends and I frequently participate in knowledge (or information) sharing activities.
2. My friends and I give advice (o suggestion) to each other.
3. My friends and I share the ideas of our life or job with each other.
4. My friends and I involve in discussions of various topics.

A.6. Social support

1. My friends and I have understanding to each other.
2. My friends and I are concerned about each other.
3. My friends and I often agree with each other's points of view.
4. My friends and I share emotion with each other.

A.7. Continuance usage intention

1. I intend to continue using Facebook.
2. My intention is to continue using Facebook than use any alternative means (EX: My space)
3. If I could, I would like to continue using Facebook over the next one year.
4. It is unlikely for me to stop using Facebook.

References

Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology, 84,* 18–28.

Anderson, N. R., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior, 19,* 235–258.

Bagozzi, R. P., & Dholakia, U. M. (2002). Intentional social action in virtual communities. *Journal of Interactive Marketing, 16*(2), 2–21.

Baker, J., Grewal, D., & Levy, M. (1992). An experimental approach to making retail store environmental decisions. *Journal of Retail, 68*(4), 445–460.

Berry, L. L., Carbone, L. P., & Haeckel, S. H. (2002). Managing the total customer experience. *Sloan Management Review, 43,* 85–89.

Bhattacherjee, A. (2001). Understand information systems continuance: An expectation–confirmation model. *MIS Quarterly, 16*(3), 351–370.

Bliese, P. D. (2000). Within-group agreement, nonindependence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 349–381). San Francisco: Jossey-Bass.

Boone, C., Declerck C, H., & Suetens, S. (2008). Subtle social cues, explicit incentives and cooperation in social dilemmas. *American Sociological Review, 29,* 179–188.

Butler, B. S. (2001). Membership size, community activity, and sustainability: A resource-based model of online social structures. *Information Systems Research, 12*(4), 346–362.

Calder, B. J., Phillips, L. W., & Tybout, A. M. (1981). Designing research for application. *Journal Consumer Research, 8*(2), 197–201.

Cappelli, P., & Sherer, P. D. (1991). The missing role of context in OB: The need for a meso-level approach. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (pp. 55–110). Greenwich, CT: JAI Press.

Chaikin, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39,* 752–766.

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology, 83*, 234–246.

Chen, G., & Kanfer, R. (2006). Toward a systems theory of motivated behavior in work team. In B. M. Staw (Ed.), *Research in organizational behavior* (pp. 349–381). Greenwich, CT: JAI Press.

Clitheroe, H. C., Jr., Stokols, D., & Zmuidzinas, M. (1998). Conceptualizing the context of environment and behavior. *Journal of Environmental Psychology, 18*(1), 103–112.

Crotts, J. C., & Erdmann, R. (2000). Does national culture influence consumers' evaluation of travel services? A test of Hofstede's model of cross-cultural differences. *Managing Service Quality, 10*(5), 410–419.

Cutrona, C. E., & Suhr, J. A. (1994). Social support communication in the context of marriage: An analysis of couples' supportive interactions. In B. R. Burleson, T. L. Albrecht, & I. G. Sarason (Eds.), *Communication of social support* (pp. 113–135). Thousand Oaks, CA: Sage.

Davis, L., Wang, S., & Lindridge, A. (2008). Culture influences on emotional response to online store atmospheric cues. *Journal of Business Research, 61*, 806–812.

Dyer, N. G., Hanges, P. J., & Hall, R. J. (2005). Applying multilevel confirmatory factor analysis techniques to the study of leadership. *Leadership Quarterly, 16*, 149–167.

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth. TX: Harcourt Brace Jovanovich.

Eastin, M. S., & LaRose, R. (2005). Alt. support: Modeling social support online. *Computer in Human Behavior, 21*, 977–992.

Ellemers, N., Kortekaas, P., & Ouwerkerk, J. W. (1999). Self-categorisation, commitment to the group and group self-esteem as related but distinct aspects of social identity. *European Journal of Social Psychology, 29*, 371–389.

Fang, Y. H., & Chiu, C. M. (2010). In justice we trust: Exploring knowledge-sharing continuance intentions in virtual communities of practice. *Computers in Human Behavior, 26*(2), 235–246.

Firebaugh, G. (1978). A rule for inferring individual-level relationships from aggregate data. *American Sociological Review, 43*, 557–572.

Firebaugh, G. (1980). Groups as contexts and frog ponds. In L. H. Roberts & L. Burstein (Eds.), *Issues in aggregation* (pp. 43–52). San Francisco: Jossey-Bass.

Gardner, M. P. (1985). Mood states and consumer behavior: A critical review. *Journal of Consumer Research, 12*(3), 281–300.

George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology, 75*(2), 107–116.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using normative appeals to motivate environmental conservation in a hotel setting. *Journal of Consumer Research, 35*, 473–482.

Ha, L., & James, E. L. (1998). Interactivity reexamined: A baseline analysis of early business web sites. *Journal of Broadcasting & Electronic Media, 42*(Fall), 457–474.

Hackman, J. R. (1992). Group influences on individuals in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial organizational psychology* (pp. 199–267). Palo Alto, CA: Consulting Psychologists Press.

Härtel, C. E. J., Härtel, G. F., & Barney, M. F. (1998). SHAPE: Improving decision-making by aligning organizational characteristics with decision-making requirements and training employees in a metacognitive framework for decision-making and problem-solving. *Training Research Journal: the Science and Practice of Training, 4*, 79–101.

He, W., & Wei, K. K. (2009). What drives continued knowledge sharing? An investigation of knowledge-contribution and-seeing beliefs. *Decision Support System, 46*, 826–838.

Hofmann, D. A., & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviors and accidents. *Personnel Psychology, 49*, 307–339.

Horowitz, L. M., Krasnoperova, E. N., Tatar, D. G., Hansem, M. B., & Person, E. A. (2001). The way to console may depend on the goal: experimental studies of social support. *Journal of Experimental Social psychology, 37*, 49–61.

Huang, C. C., Lin, T. C., & Lin, K. J. (2009). Factors affecting pass-along email intention (PAEIs): Integrating the social capital and social cognition theories. *Electronic Commerce Research and Applications, 8*, 160–169.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within group interrater reliability with and without response bias. *Journal of Applied psychology, 69*, 85–89.

Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review, 31*, 386–408.

Kang, Y. S., Hong, S., & Lee, H. (2009). Exploring continued online service usage behavior: The roles of self-image congruity and regret. *Computers in Human Behavior, 25*(1), 111–122.

Kang, Y. S., & Lee, H. (2010). Understanding the role of an IT artifact in online service continuance: An extended perspective of user satisfaction. *Computers in Human Behavior, 26*(3), 353–364.

Kaplan, S. (1987). Aesthetics, affect and cognition. *Environment and Behavior, 19*(1), 3–32.

Kim, Y. (2011). The contribution of social network sites to exposure to political difference: The relationships among SNSs, online political messaging, and exposure to cross-cutting perspectives. *Computers in Human Behavior, 27*(2), 971–977.

Kim, S. S., & Malhotra, N. K. (2005). A longitudinal model of continued IS use: An integrated view of four mechanisms underlying postadoption phenomena. *Management Science, 51*(5), 741–755.

Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J.

Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 3–90). San Francisco: Jossey-Bass.

Kuo, F. Y., & Young, M. L. (2008). Predicting knowledge sharing practices through intention: A test of competing models. *Computers in Human Behavior, 24*(6), 2697–2722.

Larsen, T. J., & Sørebø, A. M. (2009). The role of task-technology fit as users' motivation to continue information system use. *Computers in Human Behavior, 25*(3), 778–784.

Lee, K. M., & Nass, C. (2003). Designing social presence of social actors in human computer interaction. *Computer Human Interaction, 5*(1), 289–294.

Liao, C., Chen, J. L., & Yen, D. C. (2007). Theory of planning behavior (TPB) and customer satisfaction in the continued use of e-services: An integrated model. *Computers in Human Behavior, 23*(6), 2804–2822.

Lin, C. P. (2011). Modeling job effectiveness and its antecedents from a social capital perspective: A survey of virtual teams within business organizations. *Computers in Human Behavior, 27*(2), 915–923.

Lin, M. J. J., Huang, H. W., & Chen, C. J. (2009). Fostering the determinants of knowledge sharing in professional virtual communities. *Computer in Human Behavior, 25*, 929–939.

Lin, C. S., Wu, S., & Tsai, R. J. (2005). Integrating perceived playfulness into expectation–confirmation model for web portal context. *Information & Management, 42*(5), 683–693.

Liu, Y., & Shrum, L. J. (2002). What is interactivity and is it always such a good thing? Implications of definition, person and situation for the influence of interactivity on advertising effectiveness. *Journal of Advertising, 4*(Winter), 53–64.

Louis, M. R., Posner, B. Z., & Powell, G. N. (1983). The availability and helpfulness of socialization practices. *Personnel Psychology, 36*, 857–866.

Malhotra, N. K., Kim, S. S., & Patil, A. (2006). Common method variance in IS research: A comparison of alternative approaches and a reanalysis of past research. *Management Science, 52*(12), 1865–1883.

McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information Systems Research, 11*(3), 334–359.

McMillan, S. J., & Hwang, J. S. (2002). Measures of perceived interactivity: An exploration of the role of direction of communication, user control, and time in shaping perceptions of interactivity. *Journal of Advertising, 31*(3), 29–42.

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. Cambridge, MA: MIT Press.

Moon, Y. (2000). Intimate exchanges: Using computers to elicit self-disclosure from consumers. *Journal of Consumer Research, 26*, 323–339.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review, 23*(2), 242–266.

Nass, C., Fogg, B. J., & Moon, Y. (1996). Can computers be teammates? *International Journal of Human–Computer Studies, 45*(6), 669–678.

Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. *Journal of Social Issues, 56*(1), 81–103.

Nass, C., Moon, Y., & Carney, P. (1999). Are people polite to computers? Responses to computer-based interviewing systems. *Journal of Applied Social Psychology, 29*(5), 1093–1110.

Nass, C., Moon, Y., Fogg, B. J., Reeves, B., & Dryer, D. C. (1995). Can computer personalities be human personalities? *International Journal of Human–Computer Studies, 43*(2), 223–239.

Naumann, S. E., & Bennett, N. (2000). A case for procedural justice climate: Development and test of a multilevel model. *Academy of Management Journal, 43*, 881–889.

Ostroff, C., & Kozlowski, S. W. (1992). Organizational socialization as a learning process: The role of information acquisition. *Personnel Psychology, 45*, 849–874.

Pirola-Merlo, S., Härtel, C., Mann, L., & Hirst, G. (1998). How leaders influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly, 13*, 561–581.

Podsakoff, P. M., Mackenzie, S. B., & Lee, J. Y. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Prendinger, H., & Ishizuka, M. (2004). *Life-like characters: Tools, affective functions and applications*. Berlin: Springer-Verlag.

Rau, P. P. L., Gao, Q., & Ding, Y. (2008). Relationship between the level of intimacy and lurking in online social network services. *Computers in Human Behavior, 24*, 2757–2770.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models*. Thousand Oaks, CA: Sage.

Reeves, B., & Nass, C. I. (1996). *The media equation*. Stanford, CA: CSLI Publications.

Reynolds, N., Diamantopoulos, A., & Schlegelmilch, B. B. (1993). Presting in questionnaire design: A review of the literature and suggestion for further research. *Journal of the Market Research Society, 35*, 171–182.

Ridings, C., Gefen, D., & Arinze, B. (2002). Some antecedents and effects of trust in virtual communities. *Journal of Strategic Information Systems, 11*(3–4), 271–295.

Robert, L. P., Dennis, A. R., & Ahuja, M. K. (2008). Social capital and knowledge integration in digitally enabled teams. *Information Systems Research, 19*(3), 314–321.

Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the technology acceptance model. *International Journal of Human–Computer studies, 64*(8), 683–696.

Roca, J. C., & Gangné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computer in Human Behavior, 24*, 1585–1604.

Salancik, G. J., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly, 23*, 224–253.

Schneider, B. (1975). Organizational climates: An essay. *Personnel Psychology, 40*, 437–454.

Schneider, B. (1990). The climate for service: An application of the climate construct. In B. Schneider (Ed.), *Organizational climate and culture* (pp. 383–412). San Francisco: Jossey-Bass.

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science, 18*(5), 429–434.

Sethi, V., & King, R. C. (1999). Nonlinear and noncompensatory models in user information satisfaction measurement. *Information System Research, 10*(1), 87–96.

Sherif, K., Hoffman, J., & Thomas, B. (2006). Can technology build organizational social capital? The case of a global IT consulting firm. *Information & Management, 43*, 795–804.

Sørebø, Ø., & Eikebrokk, T. R. (2008). Explaining IS continuance in environments where usage is mandatory. *Computers in Human Behavior, 24*(5), 2357–2371.

Steinfield, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: A longitudinal analysis. *Journal of Applied Developmental Psychology, 29*, 434–445.

Steuer, J., & Nass, C. (1993). Voices, Boxes, and Sources of Messages Computers and Social Actors. *Human Communication Research, 19*(4), 504–527.

Sundar, S. S., & Nass, C. (2000). Source-orientation in Human–Computer Interaction. *Communication Research, 27*(6), 683–703.

Susser, M. (1994). The logic in ecological: I. The logic of analysis. *American Journal of Public Health, 85*, 825–829.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology, 88*, 500–517.

Thong, J. Y. L., Hong, S. J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation–confirmation model for information technology continuance. *International Journal of Human–Computer studies, 64*(9), 799–810.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: An empirical study of intrafirm networks. *Academy of Management Journal, 41*(4), 464–476.

Turkle, S. (1984). *The second self: Computers and the human spirit*. New York: Simon and Schuster.

Wyer, R. S., Jr., & Srull, T. K. (1989). The role of affect and emotion in information processing. In R. S. Wyer, Jr. & T. K. Srull (Eds.), *Memory and cognition in its social context* (pp. 358–371). Hillsdale, NJ: Lawrence Erlbaum Associates.

Zaltman, G. (1995). *How customers think: Essential insights into the mind of the market*. Boston: Harvard Business School Press.

Further reading

Liao, H., & Rupp, D. E. (2005). The impact of justice climate and justice orientation on work outcome: A cross-level multi-foci framework. *Journal of Applied Psychology, 90*, 242–256.

Jyun-Wei Huang. His research interests focus on the behavioral science in the organization.

Chieh-Peng Lin. His research interests focus on the behavioral science in the context of information technology. His work has been published in a variety of journals including Asian Journal of Social Psychology, CyberPsychology & Behavior, Information Systems Journal, International Journal of Human–Computer Interaction, International Journal of Electronic Commerce, International Journal of Service Industry Management, Journal of Business Ethics, Journal of Organizational and End User Computing, Journal of Business and Psychology, and Personnel Review, and so on.