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CONTRIBUTION BEHAVIOR IN VIRTUAL COMMUNITIES: COGNITIVE, EMOTIONAL, AND SOCIAL INFLUENCES[1]

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The long-term viability of virtual communities depends critically on contribution behavior by their members. We deepen and extend prior research by conceptualizing contributions to virtual communities in terms of small friendship group–referent intentional actions. Specifically, we investigate cognitive, emotional, and social determinants of shared we-intentions and their consequences for member contribution behavior to the small friendship group to which they belong within a larger community. Using multiple measurement sources and a longitudinal quasi-experimental design, we show that group norms and social identity, as well as attitudes and anticipated emotions, contribute to the development of behavioral desires, which in turn influence we-intentions. In addition, subjective norms are less effective than either group norms or social identity in encouraging contribution behavior. Finally, members' experience levels positively moderate the relationship between we-intentions and contribution behaviors, and differences between collectivistic versus individualistic orientations moderate the effects of social identity and anticipated emotions on the desire to contribute to one's friendship group in the virtual community. Tests for methods biases were conducted, as well as rival hypotheses. These findings have significant research and managerial implications.

Keywords: Anticipated emotions, desire, individualism–collectivism, novice versus experienced members, social identity, social influence, virtual communities, we-intentions

Introduction

Member contribution behavior has long been identified as a key element of the long-term viability and prosperity of virtual communities (Ren et al. 2007; Wiertz and de Ruyter 2007). In practice, increasing numbers of firms attempt to leverage the information resources that members contribute to virtual communities for product design and development, brand support, and other related activities (Nambisan and Baron 2010). The potential for significant benefits has driven information systems (IS) and marketing scholars to dedicate considerable effort to studying the antecedents of member contribution behavior (e.g., Bock et al. 2005; Jeppesen and Frederiksen 2006; Wasko and Faraj 2005). Among the theories that have frequently been employed to explain member contribution behavior in virtual communities, the theory of planned behavior (TPB; Ajzen 1991) and the social capital framework (Nahapiet and Ghoshal 1998) offer unique variables and processes that are relevant to certain aspects of virtual groups. Yet these perspectives do not capture impor-

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tant social and emotional processes or goal-directed features of member contribution behavior.

Specifically, TPB-based frameworks consider only one aspect of social influence processes—namely, felt subjective norms that arise from interpersonal pressure and reside largely in the need for approval (Eagly and Chaiken 1993). However, a closer examination of literature pertaining to virtual communities sheds considerable doubt on whether subjective norms actually influence a member's participation decisions (see Bagozzi and Dholakia 2002, 2006b). Indeed, consumer action theory and empirical research suggest that the development of knowledge about the expectations held by specific referents and the motivations to comply with their expectations typically require interactions through face-to-face encounters and occur over extended periods of time, or at least repeatedly in multiple interactions (Bagozzi 2006; Bagozzi and Lee 2002). From this perspective, social referents in virtual communities lack the ability to directly mediate rewards or punishments on each other (Bagozzi and Dholakia 2006b). Along this line, Ma and Agarwal (2007, p. 43), in their study of knowledge contributions, note that "in the disembodied virtual environment, a lack of synchronicity and immediacy can attenuate the effect of social norms on behavior." Additional research needs to identify more effective social influence drivers in virtual communities.

In addition, the antecedents of contribution behavior, according to both the TPB (e.g., Bock et al. 2005; Kuo and Young 2008) and the social capital concept (e.g., Wasko and Faraj 2005), are relatively stable, passive reactions. Especially in virtual environments, members' contribution decisions and behaviors tend to be goal directed, in which case these perspectives do not provide comprehensive explanations of contribution behavior. In a review of consumer action, Bagozzi (2006) argues that decision makers considering whether to act in goal-directed situations should take into account the emotional consequences of both achieving and not achieving the sought-after goal. Recent research on virtual groups thus suggests studying prospect-based views of emotions in members' participation decisions as an important research direction (see Bagozzi and Dholakia 2006b).

Finally, extant knowledge about the relevance of, and mechanisms underlying, decisions and intentions that determine behavior in virtual environments remains limited, despite social psychology and IS research that consistently identifies behavioral intentions as the most immediate and important predictors of actual behavior (see Armitage and Conner 2001; Venkatesh et al. 2003). Particularly in virtual communities, many members abandon contributions right before they publish them, and others offer only minimal contributions, regardless of their stated contribution intentions. This suggests that the intricacies involved in translating intentions into behavior in virtual communities seemingly have not been modeled with sufficient precision.

Against this backdrop, we attempt to enhance current understanding of member contribution behavior in virtual community settings by extending previous research in several ways. First, we add to the virtual community literature by delineating a framework that draws on the theory of collective intentionality (Gilbert 1989) to reformulate intentions, not in individualistic terms, but rather as a means to reflect *shared volitions*, which are more appropriate to social behavior associated with mutuality. Such group-based intentions have largely been ignored by IS researchers, but they determine a variety of behaviors in virtual teams and seem particularly useful for characterizing voluntary participation behavior in virtual communities (Bagozzi and Dholakia 2006b; Shen et al. 2011). Second, we advance understanding of the *cognitive*, *emotional*, and *social drivers* of member contribution behavior in geographically distributed, electronically linked environments. The importance of such an in-depth conceptualization of variables that might lead to collective behaviors in distributed environments is underscored by its presence as an intellectual core of IS (Agarwal and Lucas 2005; Benbasat and Zmud 2003).

Third, we investigate the *moderating effects of a member's experience level*, in line with research into virtual environments that reveals a link between we-intentions and participation behavior (e.g., Bagozzi and Dholakia 2006a, 2006b). By examining this moderating effect, we specify an additional boundary condition for predicting behavior based on we-intentions. Fourth, we examine whether levels of individualism or collectivism might moderate the effects of the contribution drivers, because group participation factors that are effective in one cultural orientation might induce different outcomes or even be inappropriate in another (Jarvenpaa and Leidner 1999; Wagner 1995). By empirically testing this moderator, we answer a recent call for research to broaden current understanding of the social or cultural context that regulates member contribution behavior (Bock et al. 2005, p. 101).

Theoretical Background and Hypotheses

We develop and test hypotheses pertaining to member contribution behavior in virtual communities in an attempt to complement and add to the findings of recent studies (e.g.,

Wasko and Faraj 2005; Wiertz and de Ruyter 2007); to do so, we adopt a social-psychological lens rooted in attitude-theoretic models. Most studies regarding predictions of behavior based on attitudinal variables have been situated within the framework of the TPB (Ajzen 1991). Briefly, the TPB posits that personal intentions to act are a function of (1) attitude toward the act, (2) the subjective norms regarding performance of the act, and (3) perceptions of behavioral control over the act. We also consider another attitude-theoretic model, namely, the model of goal-directed behavior (MGB), which subsumes the TPB and improves on its predictive and explanatory power (Perugini and Bagozzi 2001). The MGB posits that desires provide a direct impetus for intentions and transform reasons for acting into motivational content inducing action. Moreover, the MGB explicitly refers to the role of goal-directed emotions that people experience when they consider the prospects of succeeding and failing to act (Perugini and Bagozzi 2001). We further extend the TPB and MGB to include the role of social identity and group norms (Bagozzi and Lee 2002), both of which help explain member contribution behavior and are goal-directed in nature. We also elaborate on the we-intentions concept, argue for its distinctiveness, and establish its value for understanding contribution behavior in a virtual community, as well as its importance for encouraging collective behaviors in distributed environments. We summarize our proposed model in Figure 1.

The Role of We-Intentions in Contribution Behavior

Members of virtual communities often act jointly with others and form intentions to do so that are explicitly shared (for a review, see Bagozzi 2000, 2005). For example, members of a small group of frequently interacting virtual community participants might say, "*We* plan to have a virtual group meeting next Tuesday at 7:00 p.m.," such that the intentions explicitly refer to the collective group, rather than the singular subject, and reflect the idea of a shared consciousness that motivates social interactions. These intentions are conceptually different from personal intentions (I-intentions) that social psychologists usually study and define as the "person's motivation in the sense of his or her conscious plan to exert effort to carry out a behavior" by *him*- or *herself alone* (Eagly and Chaiken 1993, p. 168). In contrast, group-oriented intentions (we-intentions) are explicitly formulated with reference to the collective entity, with oneself construed as part of the collective and acting *together* with specific others. Tuomela (1995, p. 2) defines a we-intention as "a commitment of an individual to participate in joint action [that] involves an implicit or explicit agreement between the participants to engage in that joint action." In a social science setting, Bagozzi (2006, p. 18) argues that

> a we-intention is a collective intention rooted in a person's self-conception as a member of a particular group (e.g., an organization) or social category (e.g., one's gender, one's ethnicity), and action is conceived as either the group acting or the person acting as an agent of, or with, the group.

In our research, we focus on people who are members of small friendship groups embedded in larger virtual communities where we conceptualize a member's contribution intention as a group intention, based on the premise that members regard themselves as part of a group of friends in a virtual community and form contribution intentions in relation to this plural target (Bagozzi and Lee 2002). Moreover, contribution activities in virtual communities often require multiple members to act in concert and in a particular way to be meaningful. Our sense of acting in concert fits aspects of Weber's (1978) classic notion of social action. However, his explication of social action is more limited than ours and rests on an interpretation of action that is performed with another person in mind but does not require actual interactions among persons, and does not require mutual consciousness of the others' actions, or even the presence of the other.

From the members' perspective, membership in a friendship group gives them collectively constructed group reasons to think, emote, and act in certain ways; for example, the group's constitutive goals, values, and beliefs might determine or even constitute reasons for action. However, such joint action is not necessarily synchronous; members can perform their respective parts at different times. Nevertheless, joint actions entail coordinated endeavors among group members. According to both the TPB and MGB, a sufficient degree of actual control over the relevant behavior should cause members to carry out their intentions when the opportunity arises. Therefore, we posit that we-intentions constitute an immediate determinant of contribution behavior.

Hypothesis 1: *Greater levels of we-intentions are associated with greater levels of (a) quantity and (b) quality of a member's contributions to the friendship group in the virtual community.*

The Role of Desires in Contribution Behavior

Desires refer to the state of mind in which an agent has a personal motivation to perform an action (Perugini and Bagozzi

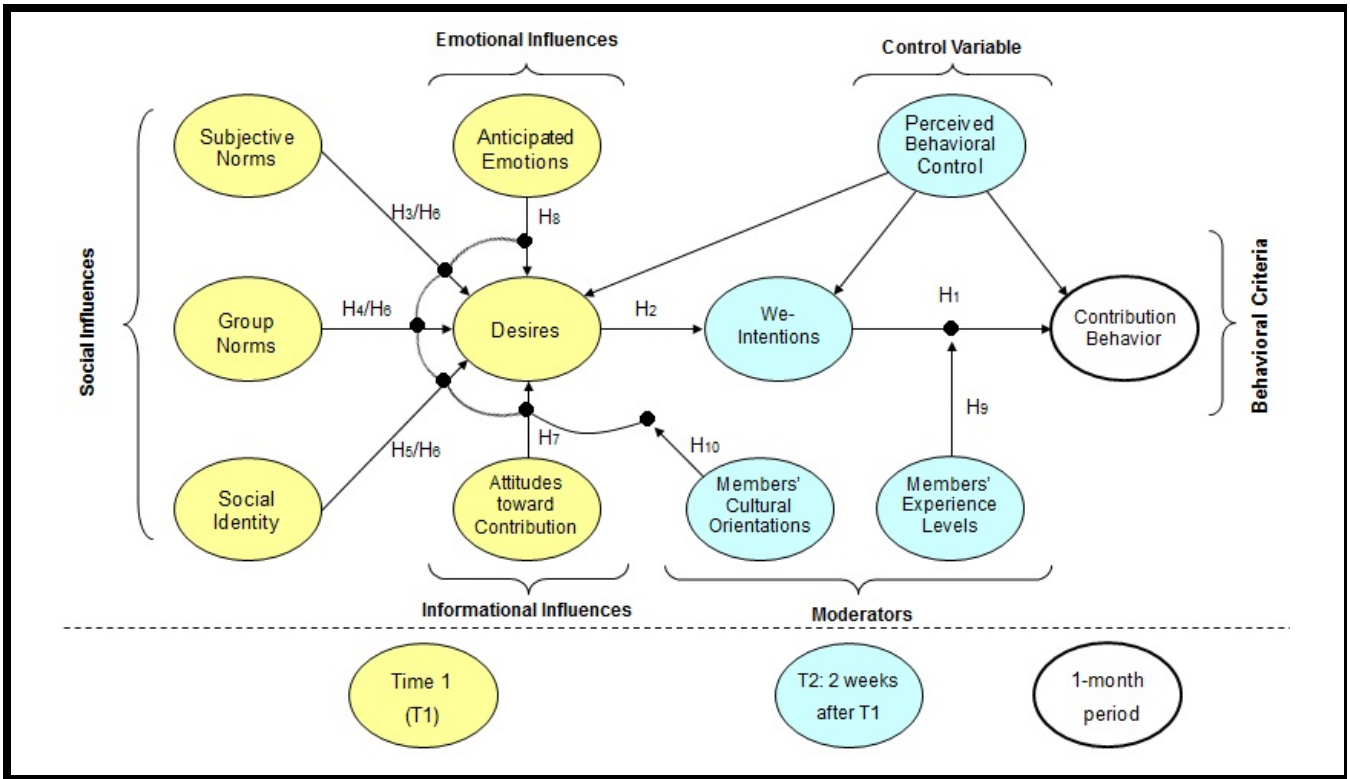

Figure 1. Conceptual Framework

2004), depending on how strongly that decision maker wants to enact a specific goal-directed behavior. Various researchers recognize that attitude theory and the TPB fail to consider how decisions become energized (e.g., Bagozzi 1992; Fazio 1995). This criticism recognizes that attitudes, subjective norms, and other commonly specified direct determinants of intentions provide reasons for acting but do not necessarily incorporate the motivational content needed to induce an intention to act. Drawing on arguments from the philosophies of mind and action, Bagozzi (1992) suggests that desires can provide this motivational impetus and perform transformative functions for the antecedents of decision making into intentions.

Recent empirical work supports this view and indicates that implementation desires mediate and transform the effects of reasons and motives for acting, as well as influence intentions to act (Bagozzi and Dholakia 2006a; Dholakia et al. 2004; Perugini and Bagozzi 2001; Perugini and Conner 2000; Shen et al. 2011). In this study, we expect behavioral desires to be predictive of members' we-intentions to contribute to virtual communities because such behavior is effortful to greater or lesser degrees (e.g., adjusting other commitments to ensure sufficient time to share articles or photos with other members). A joint commitment to act together in the form of a we-intention thus depends on the desires of individual members to achieve the collective goal, and those desires channel and convert reasons for acting (e.g., cognitive, emotional, social) into motivations for acting.

Hypothesis 2: *Greater levels of desire are associated with greater levels of we-intentions to contribute to the friendship group in the virtual community.*

The Role of Social Influence Processes in Contribution Behavior

Kelman (1974) hypothesized that three bases exist for interpersonal influence: compliance (i.e., influence based on reward or punishment aversion), internalization (i.e., acceptance of others' beliefs), and identification (i.e., influence based on liking or respect of another person). Building on Tajfel's (1978) distinctions between interpersonal and group behavior, Bagozzi and Lee (2002) reconceived group-level influences and specified them in ways analogous to interpersonal influence, that is, social compliance (normative responsiveness based on the need for approval), internali-

zation (congruence of one's values or goals with group members'), and identification (social identity: cognitive self-awareness of group membership, affective commitment to the group, and group-based or collective self-esteem). Prior research that adopts the MGB supports these claims for friendship groups organized around ownership of Harley-Davidson motorcycles (Bagozzi and Dholakia 2006a). We also expect that each process (except for compliance) influences members' desires to act, and we include them in our theoretical framework.

Compliance Processes

The social influence that underlies subjective norms reflects the influence of felt expectations of other people, which are largely based on a need for approval (Eagly and Chaiken 1993). Subjective norms are operationalized in a rather general sense in terms of felt influence with "other people whose opinions are important to me" as the source of expectations (Ajzen 1991). For an individual member, these "other people" could be virtual community members or representatives of another primary reference group (e.g., family, friends). Strong normative pressure may engender a "have-to-do" versus "want-to-do" mentality (Fu et al. 2010), such that even if the member develops contribution desires, he or she ultimately might exhibit reduced interest and vigor. Especially in virtual communities, communication involves many participants, whose engagement is relatively voluntary and anonymous. When members experience constraints imposed by the expectations of role partners (e.g., fellow members), they might change their identities or leave without exerting much effort, which enables them to regain any lost freedom (Bagozzi and Dholakia 2002). Social influence from significant others who are outside the virtual communities also might seem less salient to participants and less subject to awareness of monitoring by social referents, compared with formal relationships (Bagozzi and Dholakia 2006b). In other words, subjective normative pressures likely provide little explanatory power with regard to members' contribution decisions in virtual community settings. Thus, we propose the following hypothesis:

Hypothesis 3: *Levels of subjective norms are not associated with levels of desire to contribute to the friendship group in the virtual community.*

Internalization Processes

Internalization refers specifically to the adoption of common self-guides in an attempt to meet idealized values or goals, shared with other members of a small group of friends in larger virtual communities, that coincide with the person's own goals—that is, group norms. Eagly and Chaiken (1993) suggest that such "values" can be construed broadly to encompass beliefs and attitudes, as well as more abstract moral tenets. For a member of a friendship group, group norms derive mainly from information communicated among group members, although they also reside in the personal meaning that each member attributes to that information. Strong group norms implicitly generate consensus among members regarding when and how to engage in the group activities (Dholakia et al. 2004). In this respect, they promote mutual agreement about the specific details of participation. To the extent that a member's values and goals correlate with those of other members of the friendship group in the virtual community, we expect greater contribution desires.

Hypothesis 4: *Greater levels of group norms are associated with greater levels of desire to contribute to the friendship group in the virtual community.*

Identification Processes

In our framework, social identity captures the main aspects of a member's identification with his or her small friendship group in the virtual community; that is, the person construes him- or herself as a group member. To the extent that they increasingly identify with their group, members should recognize that they share the same core or defining attributes and therefore may come to see themselves as interchangeable representatives of the group (Ahearne et al. 2005). Recent research suggests social identity consists of three related, yet distinct, components: awareness of group membership, affective commitment to the group, and evaluative significance of group membership (e.g., Bergami and Bagozzi 2000; Ellemers et al. 1999). Awareness of group membership implies a cognitive sense of the self as a representative of a social category (Tajfel and Turner 1986). Such cognition includes judgments about similarities with other members and dissimilarities with nonmembers, which captures the consciousness-of-kind aspect of social groups. Early research into the minimal group paradigm has shown that mere membership can produce in-group favoritism among people randomly assigned to new groups, even without any actual contact among members (Tajfel 1978; Tajfel and Turner 1986). The more a member perceives him- or herself as a member of a group, the less salient his or her personal identity becomes, in a process termed *depersonalization* (Bergami and Bagozzi 2000).

Affective social identity takes this process a step further, into feelings of attachment and belongingness (Algesheimer et al. 2005), which may be labeled affective commitment and

characterized, as Allen and Meyer (1996, p. 253) do, as "identification with, involvement in, and emotional attachment to" the focal group. In brand communities, researchers similarly refer to "kinship between members" and its ability to encourage the development of relationships between consumers and brands (Algesheimer et al. 2005). Finally, the evaluative component of social identity involves the positive or negative value connotation attached to group membership (Ellemers et al. 1999), which arises from evaluations of self-worth derived from membership. Some research refers to this component as group-based self-esteem (Bagozzi and Dholakia 2002) or collective self-esteem (Luhtanen and Crocker 1992). Group-based self-esteem promotes actions that produce in-group welfare (e.g., Ellemers et al. 1999). In general, through identification processes, a person develops behavioral desires to maintain a positive, self-defining relationship with virtual community members.

Although prior research suggests that the cognitive component of social identity develops early and then influences either the affective component (Ellemers et al. 1999) or both affective and evaluative components (Bergami and Bagozzi 2000), we focus specifically on the case where the components of social identity are measured in the cross-section, where overall social identity has already formed and exists in the three components. As a consequence, we model social identity as a second-order factor that accounts for shared variance in the three components.

Hypothesis 5: *Greater levels of social identity are associated with greater levels of desire to contribute to the friendship group in the virtual community.*

Compliance Versus Internalization and Identification Processes

In addition to proposing separate main effects of social influence processes, we propose that internalization and identification processes play relatively more important roles than compliance does. The virtual environment provides an opportunity to communicate practically unlimited information about community characteristics (e.g., scripts, rules, norms, values) through multiple channels (e.g., plain text, graphic images, interactive links) (Balasubramanian and Mahajan 2001; Koh et al. 2007). As a result, the traditional trade-off between the richness and the reach of information no longer exists, which helps potential members reduce information asymmetries about any specific virtual group (Rezabakhsh et al. 2006). In turn, members' participation behaviors in virtual environments, compared with that found in face-to-face situations, are more rational and self-determined (Bagozzi and Dholakia 2002; Rezabakhsh et al. 2006), especially in the stage prior to joining. Furthermore, the unique attributes of this environment grant members the ability to engage in costless searches, gather extensive information about various virtual groups, and effectively evaluate whether the group is attractive and capable of enriching their social identity (Bagozzi and Dholakia 2002; Postmes et al. 1998).

After they have selected a specific virtual group, using the information and communication technology (ICT) of the Internet, members can conveniently consume the group's rituals, traditions, and meanings, which foster consciousness of kind (Mathwick et al. 2008). The ICT allows members' virtual communications to be more uninhibited, creative, and blunt than in-person communication tends to be (Wellman and Gulia 1999). Community cultivators might leverage the advantages of ICT to improve interaction quality and encourage collaborations among geographically dispersed members. If members offer effective solutions for their fellow members' problems, their contributions gain recognition and the body of all contributions achieves rapid dissemination. Ultimately, these characteristics help facilitate more contacts, ties, and solidarity among a virtual friendship group.

To preserve the community's capital, ICT can help accumulate and store shared information in databases and build robust structures to collate individual inputs into virtual group outcomes. With the passage of time, a virtual group with overlapping values becomes a central site for members to seek and find companionship, social support, and belongingness (Wellman and Gulia 1999). From another perspective, Postmes et al. (1998) argue that the anonymity afforded by computer-mediated groups creates *deindividuation* effects that enhance members' susceptibility to situational group norms. In general, then, we expect that group norms and social identity play more influential roles in determining individual behavioral desires, compared with compliance-based subjective norms, in a virtual group setting.

Hypothesis 6: *Group norms and social identity have stronger effects on desire to contribute to the friendship group in the virtual community than do subjective norms.*

The Role of Attitudes in Contribution Behavior

Attitudes represent the summary evaluation of a psychological object or target (e.g., attitude toward the act) along a positive-to-negative dimension (e.g., Eagly and Chaiken 1993). Attitude theorists (e.g., Armitage and Conner 2001) suggest they are cognitive or evaluative variables that provide informational content to a person in the form of inputs to his or her

decision making and that lead to behavioral desires. Attitudes arise through learning, whereby a person acquires a reaction to an object or action over a period of time or through repeated contact accompanied by reinforcement (Eagly and Chaiken 1993). Once learned, the attitude can be triggered automatically when the person gets exposed to the action or thinks about it (Fazio 1995). Following the MGB rationale, we expect that attitudes toward contributions to one's virtual community group will significantly influence desires through an information processing mechanism.

Hypothesis 7: *Greater levels of attitudes toward contributions are associated with greater levels of desire to contribute to the friendship group in the virtual community.*

The Role of Emotional Influence Processes in Contribution Behavior

According to the MGB (Perugini and Bagozzi 2001), anticipated emotions—defined as forward-looking affective reactions where members imagine the emotional consequences of contributing and not contributing—are also important bases for desires. Recent studies suggest that effortful decision making engages emotional processes: A decision maker generates alternative consequences to imagined goal success and goal failure, which then serve as input for appraisals and the generation of anticipated emotional responses (Bagozzi et al. 1998). These emotional reactions are predicated on a type of counterfactual thinking, which Gleicher et al. (1995) refer to as "prefactual appraisals" to distinguish them from backward-focused thinking processes that refer to prior events. Prefactual appraisals lead to an anticipation of discrete emotions, consistent with existing appraisal theories of emotion in the psychology literature (e.g., Frijda 1993).

Empirical research has addressed such anticipated emotions with respect to member participation in virtual communities (e.g., Bagozzi and Dholakia 2002), brand communities (Bagozzi and Dholakia 2006a), and open source software communities (Bagozzi and Dholakia 2006b). Accordingly, positive emotions should result when a member imagines pleasant aspects of the experience if he or she succeeds in contributing to the virtual community; negative emotions are likely instead if this member imagines what will happen if he or she fails to contribute. These anticipated emotions then should both positively enhance members' contribution desires.

Hypothesis 8: *Greater levels of anticipated emotions are associated with greater levels of desire to contribute to the friendship group in the virtual community.*

The Moderating Roles of Members' Experience Levels

Novice members may have a strong motivation to participate in the virtual community, often driven by some specific task orientation, such as needing to solve a problem or seeking particular information (Mathwick et al. 2008). At this stage, they may not care much if they benefit the community through their participation, but they may care deeply about whether their own specific needs get fulfilled. Moreover, newcomers do not possess comfortable routines for interacting with and predicting the responses of others, so they often reevaluate their assumptions about how other members will respond (Kim et al. 2005; Ren et al. 2007). In addition, novice members are less likely to engage in contribution processes when they are not familiar with the shared narratives, the specialized vocabulary, or the unique values embedded within an established community or its small friendship groups. Some novice members may prefer to listen to the discussions of other members without directly participating and try to learn about the community from its periphery by observing the actions of others.

However, as the member participates in the community over time, and becomes a member of a small friendship group, the nature and extent of learning likely change. An important catalyst for such change derives from ongoing participation, through which many members form meaningful interpersonal relationships within the community and interact with others to accomplish a wider range of joint goals (Carlson and Zmud 1999). In this participation process, they may receive value from the community resources they consume and, over time, incur a sense of moral obligation to the community, which they can repay by making in-kind contributions (Nambisan and Baron 2010). In addition, experienced members have more accurate expectations of responses to community needs and coordinate better with other members, because community characteristics (e.g., rituals, traditions, occasions for social interactions) generally become known to members only gradually. Furthermore, because of their greater level of engagement, experienced members clearly understand their roles and the structures in the group. Therefore, the possibility that their contribution intentions will transform into actual behavior increases over time, whereas the novice members—who participate for personal functional reasons, are unfamiliar with the community traditions, and face considerable ambiguity on entry—likely exhibit relatively weaker linkages from their we-intentions to their contribution behavior.

Hypothesis 9: *The impact of we-intentions on (a) the quantity of contribution and (b) the quality of contribution is stronger for experienced than for novice members.*

The Moderating Roles of Members' Cultural Orientations

We also posit that differences between collectivistic and individualistic cultural orientations moderate the effects of social, emotional, and informational influences on behavioral desire. There are several reasons for this hypothesis. Specifically, collectivists often maintain a general orientation toward group goals, a concern for the well-being of the group and its members, and a tendency toward cooperation (Jarvenpaa and Leidner 1999; Triandis 1995). Collectivists (versus individualists) are also more conscious of their relationships with other people and place greater value on in-group harmony and solidarity (Earley 1993; Wagner 1995). Moreover, accepting in-group norms seems virtuous to collectivists (Triandis 1995). Bagozzi and Lee (2002) argue that people with collectivistic social patterns likely experience a high degree of depersonalization in groups. Thus, internalization and identification mechanisms determine how virtual community members with collectivistic cultural orientations make contribution decisions.

By contrast, people with individualistic cultural orientations tend to be less concerned with self-categorizing and are less influenced by group membership than those with collectivistic cultural orientations (Jarvenpaa and Leidner 1999). Moreover, individualists' decision making is "regulated largely by individual likes and dislikes and cost-benefit analyses" (Triandis et al. 1990, p. 1007), which implies that attitudes likely play a pivotal role in their contribution decisions. Anticipated emotions also should feature more prominently in individualists' decision making, because emotions provide direct feedback about the fit between their personal needs (and goals) and the prospects of attaining (or failing to attain) particular goals. Formally, we hypothesize:

Hypothesis 10: *The impacts of social influences (emotional and informational influences) on desires are stronger (weaker) for members with collectivistic cultural orientations than for members with individualistic cultural orientations.*

Control Variable

In addition to these drivers, we posit that members' contribution decisions and behavior may depend on their perceived behavioral control (PBC) or sense of control over the performance of the chosen actions to enact their decision. Because many actions are problematic in the minds of decision makers, whether due to their perceived personal limitations or anticipated environmental hindrances, implementation intentions and behavior often are governed by perceived behavioral control (Ajzen 1991). Therefore, we control for these effects by including this variable in our conceptual framework in Figure 1.

Empirical Study

Setting, Sample, and Data Collection

We collected the data for this study from members of a large virtual community platform in Taiwan, which counted 165,300 registered members belonging to 3,127 virtual communities in December 2008. Although this platform is relatively new (built in April 2007), many of its communities emigrated from other platforms, attracted by its stable system quality and user-friendly interface. Most members come from Taiwan, Hong Kong, and mainland China. To enter the Web site and become a member of the communities, a user must register by choosing a user name and password. Members share information about travel, sports, or other life experiences, which is visible to every other member in real time and accessible through a searchable archive. As they do in any other voluntary social organization, the virtual members vary in both their level of contribution and their participation experience.

We designed a longitudinal, quasi-experimental field study that includes the combination of both self-reported and objective behavioral data. This approach is referred to by Chen et al. (2011) as a natural experiment that investigates the effects of treatments that researchers cannot, or find difficult to, manipulate (e.g., social interactions) and provides greater validity on causal inferences than purely statistical adjustments (Shadish et al. 2002). Specifically, at the start (Time 1), we used questionnaire items to measure desire and its antecedents. In a follow-up phase, two weeks later (Time 2), we employed a second questionnaire to assess both we-intentions and perceived behavioral control. At Time 3, we collected objective measures of contribution behavior over a period of one month following the recording of the self-reported measures. Before beginning, we obtained permission from the community service provider and the community officers. The community officers forwarded our e-mails, which explained the purpose of the survey and encouraged participation, as well as guaranteed the confidentiality of all responses. The community platform provider also designed a banner (with a hyperlink to our Web survey) posted at the entrance to the Web site (i.e., login page). Moreover, to ensure that less frequent visitors had a chance of being in the sample, the provider helped us send e-mails to members'

alternative e-mail addresses, which were required when they registered as members. To encourage respondents to complete the questionnaires at both T1 and T2, we offered a shopping voucher valued at NTD 300 (approximately U.S. $10) to those who submitted information on all waves.

The introduction to the survey for participants called it an "Opinion Survey Regarding Virtual Community Participation." Participants logged in with their user names first and identified members with whom they normally interacted. The community service provider also helped us design an assisting mechanism: When a respondent typed in her or his user name, the second Web page of the questionnaire would list 10 possible friends' names, retrieved from the database. This database, which belonged to the community service provider, accumulated data about members who recently had responded to a member's post. The participants also could choose to type in the names of members with whom they normally interacted. We did this to make vivid their small group of friends and to induce respondents to think about their group to better prepare them for the questions to follow. The methodological approach we took is known as the key informant method in the literature. Seidler (1974) was the first to develop this method, but others have refined and used the approach in business literature (e.g., Kumar et al. 1993; Nelson and Cooprider 1996). The key informant method relies on "a small number of knowledgeable participants, who observe and articulate social relationships for the researcher" (Seidler 1974, p. 816). The instructions asked them to include up to, but not necessarily, 10 group members. To avoid double entries, we recorded each respondent's user name, date, and time of survey completion.

A total of 1,255 participants completed the first wave of the survey, and 982 users completed both waves. Of the 982 respondents, 10 members came from common groups (four in this case). The analysis that follows is based on the 972 respondents, who belong to a total of 187 different virtual communities, according to the database. The number of respondents per community ranged from 1 to 40 (mean = 5.25; standard deviation = 5.74). Their average age was 37.2 years, and 422 (43.4%) were men. These respondents generally were well-educated, such that approximately 79 percent held a college degree or more. In terms of membership duration, 211 (21.7%) had belonged to their respective community for less than a year, 416 (42.8%) had belonged between one and three years, and 345 (35.5%) had belonged for more than three years.

To evaluate possible nonresponse bias, we compared early and late respondents (in the first stage) on the study variables (Armstrong and Overton 1977). Respondents who returned completed questionnaires within five days represented early respondents (N = 196; 20%), and those who responded in the last five days were the late respondents (N = 167; 17%). The lack of significant differences between the early and late respondent groups on key measures provided additional evidence that nonresponse bias was not a problem.

Measures

We adapted the items from previous research and list their sources in Table 1. A Chinese marketing professor translated the English-language questionnaire into Chinese, and two doctoral students then independently translated the questionnaire back into English to verify its accuracy. Using comparisons of the original and back-translated versions for semantic equivalence, two bilingual English–Chinese speakers then refined the survey.

The dependent variable in this study is *contribution behavior*, which we decompose into quantity and quality dimensions. To measure the former, we consider the number of messages and the number of photos each respondent posted during the one-month period following the recording of the self-report measures. Our analysis of posting frequency indicates that 31.1 percent of the respondents never posted messages during the month prior to our data collection. Most (58.9%) posted fewer than 15 times, and 3.7 percent contributed more than 25 times. The average number of message posts was 5.63, with a standard deviation of 10.41. Moreover, 67.1 percent of the respondents never posted photos during the one-month period, 15.6 percent posted fewer than 30 photos, and 11.3 percent contributed more than 50 photos. The average number of photo posts was 22.48, with a standard deviation of 69.18. To reduce skewness, we used a logarithmic transformation of the number of messages and the number of photos, then averaged them to form a single indicator of quantity for the structural equation model.

Our measure of the quality of the contributions relies on content analysis. Following Wasko and Faraj (2005), we evaluate the posts on the basis of four criteria—relevance, ease of understanding, accuracy, and usefulness—on a scale from 5 (very high) to 1 (very low). We also code the messages according to their content. Those containing only short, social messages (e.g., "Cheers," "You are genius; this is what I want") score 1, whereas those that provide useful information relevant to the issue under discussion earn a score of 5. We code social posts as 1 because members who post such messages make small, yet still helpful contributions to the community's interactions, even if the messages are not explicitly examples of information contribution behavior. In other

Table 1. Summary of Measures

Construct	Measures	Source
Positive Anticipated Emotions CR[a] = .89 AVE[b] = .80	"If I am able to participate in activities such as writing articles or sharing photos to the group of community friends I identified above during the next two weeks, I will feel" (7-point "not at all – very much" scales): (1) Relief, (2) Glad, (3) Contentment, (4) Satisfied, (5) Excited, (6) Proud, (7) Delighted, (8) Self-assured, (9) Happy.	Bagozzi et al. (1998)
Negative Anticipated Emotions CR = .90 AVE = .81	"If I am unable to participate in activities such as writing articles or sharing photos to the group of community friends I identified above during the next two weeks, I will feel" (7-point "not at all – very much" scales): (1) Angry, (2) Depressed, (3) Frustrated, (4) Worried, (5) Guilty, (6) Uncomfortable, (7) Ashamed, (8) Anxious, (9) Sad, (10) Agitated, (11) Disappointed, (12) Nervous.	Bagozzi et al. (1998)
Attitudes CR = .95 AVE = .91	Please express your attitude toward contributing to this virtual community such as writing articles or sharing photos sometime during the next two weeks: (1) Foolish – Wise, (2) Bad – Good, (3) Harmful – Beneficial, (4) Punishing – Rewarding.	Ajzen (1991)
Group Norms CR = .85 AVE = .74	"Writing articles or sharing photos together sometime within the next 2 weeks with your online group can be considered to be a goal. For each of the people listed below, please estimate the strength to which each holds the goal." (7-point "weak –strong" scales) (1) Strength of self's goal (2) Average of the strength of group members' goal	Bagozzi and Dholakia (2002)
Subjective Norms CR = .74 AVE = .59	Please express how strongly most people who are important to you feel you should or should not contribute to this community such as writing articles or sharing photos. (7-point scales) (1) Most people who are important in my life think I (circle appropriate number): should 1: 2: 3: 4: 5: 6: 7: should not contribute to this community such as writing articles or sharing photos sometime during the next 2 weeks. (2) Most people who are important to me would (circle appropriate number): approve 1: 2: 3: 4: 5: 6: 7: disapprove of me contributing to this community such as writing articles or sharing photos sometime during the next 2 weeks.	Ajzen (1991)
Cognitive Social Identity CR = .73 AVE = .57	(1) How would you express the degree of overlap between your personal identity and the identity of the group you mentioned above when you are actually part of the group and engaging in group activities? (8-point graphical "not at all – very much" scale) (2) Please indicate to what degree your self-image overlaps with the identity of the group of friends as you perceive it. (7-point "not at all – very much" scale)	Bergami and Bagozzi (2000)
Affective Social Identity CR = .83 AVE = .72	(1) How attached are you to the group you mentioned above? (7-point "not at all – very much" scale) (2) How strong would you say your feelings of belongingness are toward the group you mentioned above? (7-point "not at all – very much" scale)	Bagozzi and Lee (2002)
Evaluative Social Identity CR = .96 AVE = .92	(1) I am a valuable member of the group. (7-point "disagree – agree" scale) (2) I am an important member of the group. (7-point "disagree – agree" scale)	Bagozzi and Lee (2002)
Desires CR = .91 AVE = .84	(1) I desire to write articles or share photos with the group of my community friends I mentioned above during the next 2 weeks. (7 point "disagree – agree" scale) (2) My desire for writing articles or sharing photos with the group of my community friends I mentioned above during the next 2 weeks can be described as: (7-point "very weak desire – very strong desire" scale)	Perugini and Bagozzi (2001)
We-Intentions CR = .90 AVE = .81	(1) I intend that our group [i.e., the group of community friends you identified above] write articles or share photos together sometime during the next two weeks. (5-point "disagree – agree" scale) (2) We [i.e., the group of community friends identified above] intend to write articles or share photos together sometime during the next two weeks. (5-point "disagree – agree" scale)	Bagozzi and Lee (2002)

Notes: [a]Composite reliability.
[b]Average variance extracted.

words, we have attempted to differentiate members who did not post (score of 0) and members whose posts were in some way social in nature. In addition, we evaluate the quality of the photos according to their relevance, ease of understanding, accuracy, and aesthetics, again using a scale from 5 (very high) to 1 (very low). We calculate the average scores for each participant. In total, we analyze 5,530 stored messages and 22,073 photos from the previous month. Two coders began the analysis, but their high interrater reliability for the first 100 messages (Cohen's [1960] kappa is .86) and first 100 photos (Cohen's kappa is .84) led us to allow one of the coders to continue with the remainder of the messages, while the other coded the remainder of the photos. When requested, one of the authors, who is also a member of a photographers' association in Taiwan, helped confirm the quality of the photos. Finally, we standardized and summed the two scores (i.e., quality of messages and quality of photos) to form a single quality indicator.

Preliminary Analysis

Our full-sample structural equation model (SEM) includes all respondents and serves to test H1–8. All models were run on LISREL 8.80 (Jöreskog and Sörbom 1999). To assess the goodness of fit of the models, we conduct chi-square tests and determine the root mean square error of approximation (RMSEA), the nonnormed fit index (NNFI), the comparative fit index (CFI), and the standardized root mean squared residual (SRMR) (see Hu and Bentler 1999). Satisfactory model fits are indicated by insignificant chi-square tests, RMSEA $\leq$ .06, NNFI and CFI $\geq$ .95, and SRMR $\leq$ .08.

Two indicators operationalize each latent construct in the confirmatory factor analysis (CFA) and SEM. For latent constructs with more than two items (e.g., attitudes, positive and negative anticipated emotions), we combine items to produce two indicators according to the partial disaggregation model (Bagozzi and Heatherton 1994). Compared with methods that make each item a separate indicator, this approach yields models with fewer parameters to estimate and reasonable ratios of cases to parameters while also smoothing measurement error.

Comment on Method Bias

Common method biases occur in virtually all research contexts but are especially a problem in cross-sectional designs and for measures that are based solely on perceptions. To reduce common method biases, we employed a longitudinal design and system-captured measures of real behavior. Sharma et al. (2009) note that such an approach is least susceptible to common method bias, compared with cross-sectional designs and designs in which the measures feature only perceptual responses or perceptual responses combined with self-reported behavioral measures. In addition, we tested explicitly for common method biases as detailed in Appendix A.

Results

Measurement Model Evaluation

Internal Consistency

We use two measures to evaluate the internal consistency of constructs: composite reliability (CR) and average variance extracted (AVE). The CR is analogous to coefficient α, whereas the AVE estimates the amount of variance captured by a construct's measure, relative to random measurement error (Fornell and Larcker 1981). Estimates of CR greater than .60 and AVE greater than .50 support internal consistency (Bagozzi and Yi 1988), and as we show in Table 1, the CRs for our study range from .73 to .96, while the AVEs range from .57 to .92. Therefore, all constructs exhibit good internal consistency.

Discriminant Validity

We assess the discriminant validity of the measures with two approaches. First, we build a CFA model with 13 latent constructs and 24 measures; this model fits the data well. The goodness-of-fit statistics for the model are as follows: χ^2 (176) = 495.55, $p \approx .00$, RMSEA = .044, SRMR = .028, NNFI = .99, and CFI = .99. The correlation matrix appears in Appendix B. As a first test of discriminant validity, we check whether the correlations among the latent variables are significantly less than 1 (Bagozzi and Yi 1988) and construct 95 percent confidence intervals for each correlation coefficient. Because none of the confidence intervals includes 1, this test offers strong evidence of discriminant validity.

Second, we examine the discriminant validity of the measures using chi-square difference tests, in which we first freely estimate the correlations of all possible pairs of constructs and then constrain them to equal 1. We check whether the constraint causes a significant degradation in fit, but in all 78 cases, the tests reveal distinct factor pairs (see Appendix C). Therefore, all the measures of our constructs achieve discriminant validity.

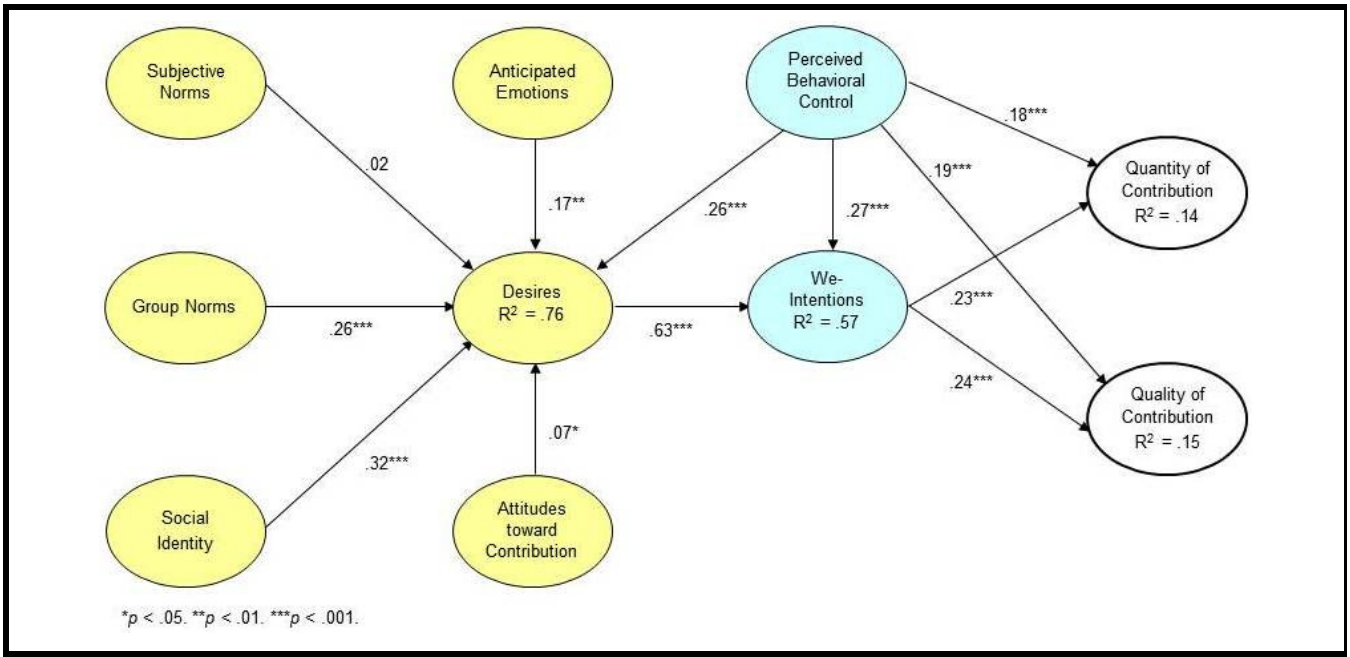

Figure 2. Parameter Estimates for the Structural Model

Structural Model Evaluation

In Figure 2, we present the structural model results; the overall fit statistics confirm that the hypothesized model provides a good representation of the structures that underlie the observed data ($\chi^2[221] = 670.90$, $p \approx .00$, RMSEA = .047, SRMR = .040, NNFI = .99, and CFI = .99). The χ^2 measure is significant ($p < .05$), as is often the case for models with large sample sizes ($N = 972$ in our study). For the relationship between we-intentions and contribution behavior, we find that we-intentions provide significant predictors of the quality ($\beta = .24$, $p < .001$, $R^2 = .15$) and quantity ($\beta = .23$, $p < .001$, $R^2 = .14$) of members' contributions to the virtual community, in support of H1a and H1b. The results also support the positive, direct relationship between desires and we-intentions, as we propose in H2 ($\beta = .63$, $p < .001$, $R^2 = .57$). Moreover, group norms ($\gamma = .26$, $p < .001$) and social identity ($\gamma = .32$, $p < .001$) emerge as significant predictors of desires, in support of H4 and H5, respectively. In addition, subjective norms are not significant predictors, so we confirm H3. The χ^2 difference tests of the equality of the coefficients indicate that the coefficients of group norms and social identity are significantly greater than the coefficient of subjective norms, in support of H6a ($\chi^2_d[1] = 8.51$, $p < .01$) and H6b ($\chi^2_d[1] = 8.20$, $p < .01$). We find a positive and significant relationship between attitudes and desires ($\gamma = .07$, $p < .05$), in support of H7. The path from anticipated emotions to desires is positive and significant ($\gamma = .17$, $p < .01$), in support of H8. These drivers explain 76 percent of the variance in desires.

We also note that all three components of social identity load at high levels on the second-order social identity factor (not shown in Figure 2). These loadings provide a rough indication of the relative contributions of the components to overall social identity. Specifically, the affective component is the strongest and, by implication, contributes the most to desires ($\gamma = .96$, $p < .001$), whereas the cognitive component is somewhat less strong ($\gamma = .79$, $p < .001$), and the evaluative component is slightly weaker ($\gamma = .75$, $p < .001$). In addition, positive and negative anticipated emotions significantly load on the higher-order anticipated emotion factor with standardized gamma parameters of .85 ($p < .001$) and .78 ($p < .001$), respectively.

Tests of Mediation and Rival Hypotheses

To further confirm the model's validity, we perform formal tests of mediation for all possible paths in the model to verify whether additional direct paths, not specified in the hypothesized model, might be significant. Table 2 shows the results for the tests of mediation. The first row in the table displays the goodness-of-fit findings for the model as pictured in Figure 1. This model serves as a baseline for χ^2 difference tests of direct paths from antecedents to consequences. For

Table 2. Mediation Tests

Model	Added Path	Goodness-of-Fit	Tests of Hypotheses
M_1	Baseline Model: Hypothesized Paths	χ^2 (221) = 670.90, $p \cong .00$, RMSEA = .047, NNFI = .99, CFI = .99	
M_2	Desires → Quantity of Contribution	χ^2 (220) = 669.68	M_1–M_2: χ^2_d (1) = 1.22, $p > .26$
M_3	Desires → Quality of Contribution	χ^2 (220) = 670.30	M_1–M_3: χ^2_d (1) = .60, $p > .43$
M_4	Social Identity → We-Intentions	χ^2 (220) = 670.69	M_1–M_4: χ^2_d (1) = .21, $p > .64$
M_5	Group Norms → We-Intentions	χ^2 (220) = 668.50	M_1–M_5: χ^2_d (1) = 2.40, $p > .12$
M_6	Anticipated Emotions → We-Intentions	χ^2 (220) = 669.27	M_1–M_6: χ^2_d (1) = 1.63, $p > .20$
M_7	Subjective Norms → We-Intentions	χ^2 (220) = 669.24	M_1–M_7: χ^2_d (1) = 1.66, $p > .19$
M_8	Attitudes → We-Intentions	χ^2 (220) = 670.73	M_1–M_8: χ^2_d (1) = .17, $p > .68$

example, the second row in Table 2 presents the χ^2 values for the model of Figure 1 with a direct path from desire to quantity of contribution added. The difference in χ^2-values between the baseline model and this model ($\chi^2_d = 1.22$), with one degree of freedom, is a test of the significance of the added path. As this difference is not significant ($p > .26$), we may conclude that the direct path from desire to quantity of contribution is insignificant, and therefore we-intentions fully mediate the effect of desire on quantity of contribution, as hypothesized. As we show in Table 2, the seven tests of rival hypotheses for the direct effects indicate that none of the added paths is significant. In general, these mediational analyses provide additional confidence in the veracity of the proposed theoretical framework.

Moderating Influences of Member Experience

To test our hypotheses pertaining to the moderating effects, we conduct multiple-group analyses (Jöreskog and Sörbom 1999), with a median split to separate the groups according to their experience levels. We build separate structural models for the two subsamples and conduct moderation tests to identify any differences in the respective coefficients of the hypothesized paths. In the first (i.e., baseline) model, the effect of we-intentions on the quality of the contribution varies across groups; in the second, we constrain the effect to be equal across subsamples. If the model with the equality constraint fits the data significantly worse than the baseline model, we know that the moderator variable influences the relationships under consideration. As we show in Table 3, the path from we-intentions to the quantity of the contribution is stronger for the experienced subsample ($\beta = .50$, $p < .001$, $R^2 = .15$) than for the novice subsample ($\beta = .18$, $p < .001$, $R^2 = .11$), in support of H9a. We also predict that the path from we-intentions to contribution quality would be stronger for the experienced subsample; the results confirm that this path is stronger for the experienced group ($\beta = .53$, $p < .001$, $R^2 = .18$) than for the novice group ($\beta = .21$, $p < .001$, $R^2 = .12$), in support of H9b. In sum, member experience moderates the effects of we-intentions on both forms of contribution behavior.

Moderating Influences of Members' Cultural Orientations

To investigate moderating influences of members' cultural orientations on the links from cognitive, emotional, and social influences to behavioral desires, we conduct multiple-group analyses to determine whether the strengths of the paths from the drivers to desires differ for collectivistic versus individualistic subgroups of respondents. Although Hofstede (1980) claims that studies of cultural values are meaningful at the societal level, his value dimensions also tend to vary widely over individual members within societies (Farh et al. 2007). Therefore, we use a median split to separate the sample according to the respondents' composite scores on two collectivism–individualism items (Triandis et al. 1990): (1) the most important thing in my life is to make myself happy, and (2) I tend to do my own thing, and most people in my family do the same. As Table 4 shows, the results of our analyses indicate that subjective norms still do not predict behavioral desires in either subsample. Furthermore, the paths from both social identity and group norms to behavioral desires are significant for the collectivistic subsample ($N = 517$; $\gamma_{GN} = .28$, $p < .01$; $\gamma_{SI} = .47$, $p < .001$), whereas the paths from attitudes and anticipated emotions to behavioral instead are significant for the individualistic subsample ($N = 455$; $\gamma_{ATT} = .11$, $p < .05$; $\gamma_{AE} = .51$, $p < .05$), in support of H10.

Table 3. Effect of Experience on the Relationship between We-Intentions and Contribution Behavior

	Experienced Members Subsample (N = 522)		Novice Members Subsample (N = 450)	
Hypothesis	Standardized Coefficient (t-value)	R^2	Standardized Coefficient (t-value)	R^2
We-Intentions → Quantity of Contribution[a]	.50* (7.76)	.15	.18* (3.95)	.11
We-Intentions → Quality of Contribution[b]	.53* (8.58)	.18	.21* (4.22)	.12

Notes: *p < .001.
[a]Change is in hypothesized direction and significant ($\chi^2_d[1] = 10.87$, $p < .001$).
[b]Change is in hypothesized direction and significant ($\chi^2_d[1] = 8.78$, $p < .003$).

Table 4. Effects of Collectivism–Individualism on Links from Social, Emotional, and Informational Influences to Behavioral Desires

	Collectivist Members Subsample (N = 517)	Individualistic Members Subsample (N = 455)
Hypothesis	Standardized Coefficient (t-value)	Standardized Coefficient (t-value)
Subjective Norms → Desires[a]	-.03 (-.33)	.03 (.35)
Group Norms → Desires[b]	.28** (2.68)	.17 (1.37)
Social Identity → Desires[c]	.47** (3.64)	-.01 (-.08)
Attitudes → Desires[d]	.02 (.49)	.11* (2.03)
Anticipated Emotions → Desires[e]	-.06 (-.53)	.51* (2.24)

Notes: *p < .05; **p < .01.
[a]$\chi^2_d(1) = .02$, $p > .88$. [b]$\chi^2_d(1) = .59$, $p > .44$. [c]$\chi^2_d(1) = 5.35$, $p < .03$. [d]$\chi^2_d(1) = .30$, $p > .58$. [e]$\chi^2_d(1) = 5.74$, $p < .02$.

Discussion and Conclusion

The purpose of our research has been to enhance understanding of why members voluntarily contribute to small friendship groups in virtual communities. With a longitudinal design and multiple measurement sources, we find support for the theory that we-intentions are strong proximal determinants of members' contribution behavior. We also find that we-intention decisions to contribute to virtual communities are functions of cognitive, emotional, and social drivers. Attitudes toward contributions provide the informational content to the member and thus become inputs to his or her decision making, reflecting cognitive and evaluative influence processes. Positive and negative emotions associated with anticipating goal achievement function as strong determinants of we-intentions and reflect emotional influence processes. Furthermore, social identity and group norms drive decisions to contribute and reflect group-level influences. All three drivers produce effects on we-intentions through a fully mediating role of desires, as we hypothesized. Finally, a member's experience level affects the translation of we-intentions into contribution behavior, and differences between collectivistic versus individualistic cultural orientations moderate the effects of social and emotional influences on behavioral desire. Taken together, our findings demonstrate that enhanced insights can accrue from combining the MGB and our extension with other attitude theories and new variables to establish an explanatory platform for social behavior. We discuss each of these results in turn, along with their implications, and suggest some directions for further research.

Theoretical Implications

Unlike the traditional personal intention that refers to an action that one will do alone, we conceptualize contributions to virtual communities as invoking intentions with group action as the referent. This study clarifies the nature of intentions beyond descriptions in the psychology literature that have focused almost exclusively on personal intentions, in that our study reveals that a person may possess a collective intention when he or she intends to act as part of a group activity. This conceptualization is especially critical in virtual communities, where social interaction is the objective and a main draw for individual participants. The resulting joint communication and positive experiences are direct products consumed by members; therefore, we-intentions, which encapsulate joint behaviors by members of a collective, are appropriate and should be measured by researchers who hope to make accurate predictions or inferences about group-referent intentional actions. Ongoing research into social interactions, whether they occur online or in more traditional settings, thus can draw on and benefit from our conceptual and logical formations of we-intentions (see also conceptual arguments in Bagozzi 2000, 2005; Bratman 1997; Gilbert 1989; Tuomela 1995).

Our research also extends previous studies by demonstrating that desires fully channel the effects of cognitive, emotional, and social appraisals on decisions to contribute to virtual communities. Over the years, various researchers have pointed out that attitude theory and/or the TPB fail to consider how decisions become energized and suggested that decision-making models should incorporate desires that are fundamental psychological states and necessary to convert reasons for action into intentions to act (e.g., Bagozzi 1992; Fazio 1995). Accordingly, we show that desires are more proximal determinants of intentions to perform contribution behaviors than other appraisals. This finding is important and unique compared with prior research (e.g., Bock et al. 2005; Kuo and Young 2008) that links reasons for action (e.g., attitudes, subjective norms, perceived behavioral control, and organizational climate) to contribution intentions, which yield predictive or correlative content but not necessarily explanatory content. We find that desires represent the motivational impetus of volition, while integrating the effects of distal antecedents (predictors) of contribution behavior on decision making. Furthermore, the results of Bock et al. (2005) indicate that the three explanatory variables they studied account for 32 percent of the variance in contribution intentions (and 48 percent of the variance in contribution intentions in Kuo and Young's [2008] study), but our results reveal that desires, together with perceived behavioral control, explain significantly more variance in intentions (R^2 = 57%). Our research thus deepens and extends previous work by demonstrating that desires function as conceptually essential motivational content that is needed to induce an intention to act and results in greater explained variance.

In addition, this study extends existing models (e.g., Chiu et al. 2006; Wasko and Faraj 2005; Wiertz and de Ruyter 2007) by showing that anticipated emotions positively influence members' decisions to contribute to virtual communities. In this sense, we address an important limitation of social capital-based and TPB-based frameworks, namely, their failure to take into account emotional reactions to contemplated actions, over and above attitudinal, normative, and control judgments. Anticipated emotions are not passive responses retrieved from memory but rather are dynamic constructions that indicate how a decision maker feels about contingent outcomes related to goal pursuit (Bagozzi 2006). We believe that to understand active contribution behavior, analyses of contribution drivers must go beyond a traditional focus on relatively stable or passive reactions (e.g., attitudinal predispositions) and incorporate prospect-based views of emotions. This extension of perspective is especially warranted when many members' contribution decisions and behaviors are goal directed, because expected and unexpected events can facilitate or interfere with goal attainment.

With regard to the three group-level influences, we find that internalization and identification processes play relatively more important roles than compliance does. Particularly in an Internet context, member interactions are not limited by geography or other challenges to getting together, as face-to-face groups are (Balasubramanian and Mahajan 2001). The site typically features a memory device with indexing systems and search aids, accessible to all members. These ICT traits not only provide opportunities for community development, by creating cultural capital, but also help members consume rituals and traditions. In turn, they elicit members' social identities and help develop and transmit group norms. In addition, unlike traditional, place-oriented communities, which may impose membership involuntarily through chance of birth or proximity of residence, membership and engagement in virtual communities result mostly from the volitional choice enabled by the very configurations of the virtual space (Bagozzi and Dholakia 2002). Our results pertaining to social processes thus complement findings derived from Olivera et al.'s (2008) adoption of a cognitive–motivational approach to contribution behavior in geographically distributed organizations, which does not accommodate social phenomena in the form of group normative influences.

Moreover, we find that subjective norms do not significantly influence behavioral desires, whereas most TPB-based

research suggests that subjective norms play a key role in human decision-making processes. The insignificant relationship might reflect the mostly voluntary and anonymous features of participation in virtual communities. Members experience little or no basis for the threats or promises that typically underlie normative compliance. Moreover, Internet technology creates a distributed network environment, in which community cultivators or senior members remain on the same footing as average members (Kucuk and Krishnamurthy 2007). Every member enjoys equality in speech, in contrast with centralized systems or traditional, bounded communities that allow certain members greater reward, coercive, and legitimate power. If virtual community members experience constraints or perceive less freedom to act with volition, they can terminate their membership in the virtual community conveniently and effortlessly—often simply by ending the navigation session and never returning to the community domain. Therefore, by examining the role of subjective normative pressures in virtual environments, we add to a growing body of literature that suggests that TPB-based social influence explanations of participation behavior apply insufficiently in contexts in which various group members (e.g., senior members, newcomers) are geographically and temporally dispersed.

In addition, we bring some clarity to the literature by showing that social processes (i.e., social identity and group norms) are more salient for members with collectivistic cultural orientations, whereas psychological processes (i.e., anticipated emotions and attitudes) are more salient for those with individualistic cultural orientations. Members who exhibit individualistic-based orientation styles place considerable importance on asserting themselves and are driven by self-serving motives (Earley 1993; Triandis 1995). Therefore, internal states feature more prominently in their contribution decisions. In contrast, collectivists regard themselves as fundamentally connected with significant others and emphasize the development of values such as belongingness, social harmony, and cooperation (Triandis 1995). In accordance with this emphasis, social determinants play pivotal roles in their decision making. Overall, these findings, derived from an approach that adopts a quasi-experimental approach, help supplement more traditional, linear models that ignore both contingencies and moderators.

Finally, this study deepens and extends prior research by demonstrating that the effects of we-intentions on members' contribution behaviors are contingent on members' experience level. The construct of PBC was added to the TPB in an attempt to deal with situations in which people may lack complete volitional control over the behavior of interest (Ajzen 1991). However, predictions about the effects of PBC on decision-making processes seem clouded by the explicit assumption that PBC is an accurate representation of actual control, such that Armitage and Conner (2001, p. 473), in their meta-analysis of the TPB, state that "PBC will rarely reflect actual control in a very accurate way" and call for investigations into the conditions for predicting behavior based on intentions. Our study therefore takes a closer look at the intention–behavior relationship by investigating members' experience in a way that reflects actual control more accurately. From a resource-accumulation perspective, as members participate in and experience the complexity of human interactions, the nature and extent of their resources embedded within the community should change. For example, experienced members might have greater access to important information or form closer friendships with other members. Such invaluable resources help members actualize intentions into contribution behaviors because "when the behavior itself involves significant resources, enactment difficulty will be even higher" (Park et al. 2010, p. 5). From an empirical standpoint, our study advances previous correlational evidence by providing a more rigorous causal examination of the moderating mechanisms.

Managerial Implications

The emergence of new information and communication technologies has initiated radical transformations in social interactions, which in turn have important implications for the formation of virtual communities. Virtual communities hold great promise as marketing tools because they can offer valuable insights into product innovation, facilitate deep and enduring bonds with consumers, and reduce customer service costs (e.g., Hagel and Armstrong 1997). However, such value can only be realized if member contribution behavior is well motivated and appropriately supported (Ma and Agarwal 2007). Thus, an important question arises: How can voluntary contributions be encouraged among community members who interact through technology-mediated communication? Virtual community members' contributions depend particularly on the nature and quality of their relationships in small groups of friends within larger communities.

Our study suggests that community cultivators should focus on increasing members' identification with the communities and especially the small group in which they frequently participate and also influence group norms to further shape member contribution behavior. To develop member–community identification, cultivators or managers should place the emphasis on building the favorability of their community's internal and external characteristics (Ahearne et al. 2005). For example, greater member responsiveness not only

makes the community identity more attractive but also evokes members' feelings of obligation to reciprocate the "friendliness," which then facilitates the development of psychological bonds with communities (Chiu et al. 2006). Moreover, members may feel proud to participate in a virtual community that they believe has socially valued characteristics (e.g., a positive external image), and their self-esteem could be bolstered by the chance to "bask in reflected glory" of group achievements and reputation (Ahearne et al. 2005; Bergami and Bagozzi 2000). To trigger group norms, managers should thoughtfully design and execute their ongoing communication strategies, because group norms arise primarily from information communicated among group members—especially in Chinese society, which emphasizes socializing with others as part of the collective. This task is likely to be easier for virtual communities with small, relatively homogeneous segments of target members (Boyd et al. 2012).

We also find that attitude is an influential antecedent to members' desires to contribute to the friendship group in the virtual community. Commonly used practices to influence members' attitudes toward contribution behavior in virtual communities include enhancing the extrinsic benefits that contributing members receive. For example, public recognition of contributions offers an important social reward that assigns an unambiguous value to a member's contribution and increases the perceived meaningfulness of proactive participation behavior. However, caution is necessary with regard to this type of reward mechanism, because the overly aggressive use of external reward systems in virtual communities can backfire. Public recognition may inadvertently convey a sense of superiority to members who contribute but inferiority to receivers and thus can be disruptive in collective endeavors in which people prefer to *fit-in* rather than *stand-out*.

Finally, members' experience level significantly facilitates the conversion of their intentions into actual contribution behaviors. Thus, community cultivators should recognize the role of socialization in virtual communities. An effective socialization process gives newcomers positive social support and exposure to experienced members, rather than holding them at arm's length, such that they become lurkers—members who consume the beneficial outcomes of the social interactions among others in the group without contributing to them. Especially in a virtual environment, members are geographically distributed and electronically linked, so newcomers need more time to form impressions and decode social cues (Carlson and Zmud 1999). Moreover, when entering a virtual community, newcomers often experience a shock as they attempt to reconcile their preconceived notions with the newfound reality. These elements all increase the psychological distance between the self and members in the community. Instead, virtual communities should offer newcomers a mentoring program, in which insiders serve as role models and help newcomers adjust. Senior members are especially good role models to indicate the need for proactive participation, spell out community values, and explain the elements of effective participation.

Limitations and Future Research

In interpreting the findings, we recognize several limitations of our study. First, it is unclear whether our findings generalize to all types of virtual communities. We study members from the same community platform, which only features a few types of communities. The contribution determinants we test may differ in other types of communities. Richer insights might derive from additional studies conducted in different types of virtual communities across multiple community platforms. For example, extrinsic rewards or incentives likely have greater influences on member contribution behavior in transaction-based virtual communities, whereas altruism elements may be the most important motivators of contribution behaviors in cancer support virtual groups. In addition, findings from knowledge management research (e.g., Gray and Meister 2004) and organizational citizenship behavior (e.g., Organ 1994) imply that individual attributes (e.g., learning orientation, conscientiousness) have direct effects on group engagement. An expansion of the contribution behavior model developed herein, to include individual attributes in different types of virtual community settings, would be a particularly interesting extension to this work.

Second, this study is limited to an individual-level analysis, whereas group-level community characteristics could also influence members' participation decisions. For example, perceived community receptivity might strengthen the effects of individual motivational drivers of contribution behavior. Moreover, community reward mechanisms might facilitate the transformation of we-intentions into contribution behavior. We thus call for additional research that uses multilevel modeling to reflect group interaction dynamics, which would permit the simultaneous investigation of individual- and group-level effects and further advance understanding of contributions in online environments.

Third, we found relatively low levels of explained variance for members' contribution behaviors. We suggest several possible reasons. In a meta-analytic review of 185 TPB-based studies, Armitage and Conner (2001) find that for self-reported behavior measures, the TPB accounts for 11 percent more variance in behavior than when the measures involve

objective observations of behavior. In this study, we used objective behavioral data pertaining to member information contribution, so we attained low levels of explained variance for members' contribution behaviors. Our relatively low explained variance also might reflect the strong Confucian cultural influence in our study setting. In their assessment of knowledge-sharing behavior in Korea, Bock and Kim (2002) find that although a person's intention to share knowledge can directly predict his or her behavior, it accounts for only 1.4 percent of the variance in actual knowledge-sharing behaviors. Similarly, Kuo and Young's (2008) study of knowledge sharing in virtual communities in Taiwan reveals that intention to share knowledge, together with perceived behavioral control, accounts for 1 percent of the variance in knowledge-sharing behavior. Therefore, they highlight cultural influences; for example, sharing knowledge in public could be interpreted as "showing off" and cause unanticipated detrimental consequences and negative reactions from important referents. We also observe members' information contribution behavior in public, which usefully limits the scope of our analysis but forces us to ignore contributions through private channels. For example, the community platform we study contains a rating mechanism that elevates the visibility of members' contributions. However, some members prefer private communication channels, such as e-mail, as the means to offer information or assistance to other members because the visibility of their contributions prompts additional, time-consuming requests for aid. Additional research should consider members' contributions in different channels and of different types (e.g., assistance in recruiting new members).

Conclusion

We synthesize and extend different attitude-theoretic models, social identity theory, and the idea of collective intentionality to build and test a theory regarding member contribution behavior in virtual communities. We also deepen and extend prior research by conceptualizing contributions to virtual communities in terms of group–referent intentional actions. At the same time, we investigate cognitive, emotional, and social determinants of shared we-intentions and identify an important boundary condition for predicting contribution behavior based on we-intentions, namely, a member's experience. Finally, our findings suggest that the relative importance of contribution behavior drivers depends on collectivistic versus individualistic cultural orientations. Overall, our theoretical model, which received strong empirical support, provides a foundation for further study of why members contribute their time and information to benefit member friends and the virtual community to which they belong.

Footnote

Multicollinearity offers another possible explanation of why the subjective norms do not significantly influence desires. The completely standardized results for the factor intercorrelations reveal that subjective norms correlate at .49 with desires, which is high; subjective norms also correlate with other explanatory variables for desires, including social identity (.64), anticipated emotions (.65), and group norms (.51). This pattern of correlations possibly accounts for the insignificant predictions of desires by subjective norms.

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CONTRIBUTION BEHAVIOR IN VIRTUAL COMMUNITIES: COGNITIVE, EMOTIONAL, AND SOCIAL INFLUENCES

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Appendix A

Results of Assessing Common Method Bias

We examined the robustness of the results with four approaches. First, as Podsakoff et al. (2003) recommend, we employed Harman's one-factor test. This test assesses the threat of common method bias by indicating whether a single latent factor offers a viable alternative explanation of the analysis. The one-factor latent model yielded a chi-square of 6063.27 (d.f. = 209). The fit of the one-factor model was significantly worse than that of the measurement model. Therefore, we gained preliminary evidence that the measurement model was robust to common method variance.

Second, considering possible limitations of Harman's one-factor test, we employed Lindell and Whitney's (2001) marker variable assessment technique. We chose attractiveness of uploaded photos (AUP) as the marker variable for the analysis, because it is theoretically unrelated to our dependent variable of we-intentions. The we-intentions and AUP exhibited nonsignificant correlations of .02. Therefore, we used AUP's measured correlation with the dependent variable as an indication of method variance. None of the significant correlations in the overall model became insignificant after adjustment, providing additional evidence against the existence of common method bias in our data.

Third, we added an unmeasured latent method factor and allowed all self-reported items to load on both their theoretical constructs and the method factor (Bagozzi 2011). This model fit well: $\chi^2[199] = 451.31$, $p \approx .00$, RMSEA = .036, SRMR = .035, NNFI = .99, and CFI = .99. All item loadings on the common method factor were much lower than the loadings on their respective constructs, and the structural model estimates for our hypothesized effects remained virtually unchanged after we introduced the method factor, which also suggests that common method bias did not bias the results.

Finally, common method bias was unlikely to explain the hypothesized moderating effect of members' experience level on the link between we-intentions and contribution behavior, because the survey respondents should not have easily anticipated any complicated interactive relationships in the framework (Aiken and West 1991). Collectively, across the four criteria we examined, we can conclude that common method bias does not present a significant threat to the study.

Appendix B

Correlation Matrix of Latent Variables for Full Sample

	M[a]	SD[b]	QN	QL	WEI	DES	SN	GN	CSI	ASI	ESI	PAE	NAE	ATT	PBC
Quantity of Contribution (QN)	–[c]	–[d]	n/a												
Quality of Contribution (QL)	–[e]	–[f]	.85 (.04)	n/a											
We-Intentions (WEI)	3.97	.76	.33 (.03)	.35 (.03)	.90*										
Desires (DES)	5.38	1.19	.34 (.03)	.33 (.03)	.76 (.03)	.92									
Subjective Norms (SN)	5.18	1.45	.24 (.03)	.22 (.03)	.58 (.03)	.49 (.03)	.77								
Group Norms (GN)	4.95	1.29	.05 (.03)	.08 (.03)	.47 (.03)	.60 (.03)	.51 (.03)	.86							
Cognitive Social Identity (CSI)	4.43	1.21	.03 (.03)	.01 (.03)	.44 (.03)	.55 (.03)	.58 (.03)	.56 (.03)	.75						
Affective Social Identity (ASI)	5.03	1.18	.15 (.03)	.13 (.03)	.58 (.03)	.78 (.03)	.67 (.03)	.65 (.03)	.76 (.03)	.85					
Evaluative Social Identity (ESI)	3.95	1.44	.11 (.03)	.10 (.03)	.46 (.03)	.61 (.03)	.58 (.03)	.49 (.03)	.58 (.03)	.71 (.03)	.96				
Positive Anticipated Emotions (PAE)	5.45	1.23	.12 (.03)	.10 (.03)	.55 (.03)	.67 (.03)	.67 (.03)	.53 (.03)	.60 (.03)	.69 (.03)	.51 (.03)	.89			
Negative Anticipated Emotions (NAE)	4.15	1.62	.12 (.03)	.11 (.03)	.44 (.03)	.55 (.03)	.63 (.03)	.38 (.04)	.58 (.03)	.64 (.03)	.51 (.03)	.67 (.04)	.90		
Attitudes (ATT)	5.89	1.20	.13 (.03)	.11 (.03)	.36 (.03)	.47 (.03)	.40 (.03)	.46 (.03)	.35 (.03)	.43 (.03)	.34 (.03)	.42 (.03)	.30 (.03)	.95	
Perceived Behavioral Control (PBC)	5.80	1.07	.32 (.03)	.33 (.03)	.61 (.03)	.54 (.03)	.33 (.03)	.40 (.03)	.27 (.03)	.36 (.03)	.31 (.03)	.31 (.03)	.14 (.03)	.25 (.03)	.85

Notes: [a]M = Mean, [b]SD = Standard Deviation. [c]$M(QN_{article}) = 5.63$, $M(QN_{photo}) = 22.48$; [d]$SD(QN_{article}) = 10.41$, $SD(QN_{photo}) = 69.18$; [e]$M(QL_{article}) = 1.36$, $eM(QL_{photo}) = .74$; [f]$SD(QL_{article}) = 1.08$, $SD(QL_{photo}) = 1.14$. *The diagonal elements represent the square root of AVE.

Appendix C

Chi-Square to Evaluate Discriminant Validity of Factor Pairs

	QN	QL	WEI	DES	SN	GN	CSI	ASI	ESI	PAE	NAE	ATT
QL	17.50*											
WEI	182.34	179.52										
DES	168.00	168.48	73.30									
SN	352.28	357.99	192.24	139.93								
GN	388.10	368.75	185.79	151.96	128.06							
CSI	831.18	459.00	177.62	148.28	151.03	135.22						
ASI	346.57	36.89	178.37	121.89	157.80	135.45	87.41					
ESI	309.70	315.19	136.88	117.84	161.68	155.67	124.03	83.07				
PAE	28.34	295.86	127.58	96.55	126.70	137.46	10.45	95.93	87.32			
NAE	322.10	337.14	153.05	121.78	205.32	143.51	106.72	101.83	117.30	66.49		
ATT	316.78	328.31	206.70	165.66	255.36	201.27	127.43	111.58	129.93	78.22	64.92	
PBC	207.89	205.93	85.44	115.84	225.64	206.68	222.35	244.49	208.43	218.40	205.77	301.81

Notes: QN = Quantity of Contribution, QL = Quality of Contribution, WEI = We-Intentions, DES = Desires, SN = Subjective Norms, GN = Group Norms, CSI = Cognitive Social Identity, ASI = Affective Social Identity, ESI = Evaluative Social Identity, PAE = Positive Anticipated Emotions, NAE = Negative Anticipated Emotions, ATT = Attitudes, PBC = Perceived Behavioral Control.
*The difference in the chi-square values of the two models (i.e., the baseline and the constrained model), with one degree of freedom.

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