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The Impact of Avatar Appearance and Offline Identity Disclosure on Trust in Virtual Worlds

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ABSTRACT

This study attempts to understand how people can promote cognition-based trust in virtual worlds such as Second Life. The effects of the two presentation formats on avatars' appearance as well as the moderating role of the disclosure of offline identity were examined in a laboratory experiment. The experimental results show that (1) a more sophisticated avatar leads to higher cognition-based trust than a less sophisticated avatar; (2) under a more sophisticated avatar condition, the absence of offline information and the presence of offline information lead to the same level of cognition-based trust; (3) under a less sophisticated avatar condition, the presence of offline information leads to higher cognition-based trust than the absence of offline information. This research contributes toward the understanding of identity verification on interpersonal trust in virtual environments.

Keywords

Avatar, identity, interpersonal trust, offline profile, self-disclosure, self-presentation, virtual teams, Second Life

INTRODUCTION

People using information technology of virtual environments convey their identity, presence, location, and activities to others through their avatars. Through avatars, individuals interact with the contents of the virtual world and communicate with others using various media (Benford et al., 2001). Some people purchase virtual products to satisfy their alter ego, avatar. Therefore, companies regard human-controlled avatars as consumers in cyberspace (Hemp, 2006).

A virtual identity established online sometimes does not coincide with the real identity of the same person established offline because the Internet has provided anonymity and flexibility (Kim and Que, 2007). Since the social cues (such as gender, age, and race) are less trustworthy in the online context than in the offline context, it is valuable how to promote interpersonal trust in virtual teams. Although there are people perceiving their virtual identities to be equivalent to their offline identity (Yee, 2007), many people endeavor to give a desired impression to others by selecting different identities and playing multiple identities in virtual worlds. For this reason, building trust on the online identities would be an important issue, especially where the virtual team members have not been met before. Furthermore, the perceived identity verification of team members can affect the performance of virtual teams, directly or indirectly (Ma and Agarwal, 2007). Therefore, identity verification is salient in the initial stage of interactions, though strangers may be uncertain as to which behaviors would form an ideal impression.

Some researchers (Lee et al., 2004) have examined the relation between the determinants of trustworthiness and presented information, but those studies have conducted in economic contexts in order to support trustworthiness estimations of buyers/sellers. Moreover, previous research on how self-disclosure functions in virtual environments has been ambiguous (Gibbs et al. 2006). This study is to analyze the effect of self-presentation through 3D avatars and perceived identity verification on interpersonal trust in virtual environments. Furthermore, this study also aims to investigate the moderating effects of offline information disclosure on cognition-based trust, particularly in the early stages of relationship development.

This research seeks answers to the following two research questions:

- (1) How can we promote cognition-based trust between strangers in virtual communities?
- (2) Does offline information disclosure matter in the cognition-based trust?

THEORETICAL BACKGROUND

Self-Presentation Theory and Uncertainty Reduction Theory

According to Schau and Gilly (2003), self-presentation is the intentional and tangible component of identity. Hence, people present their personal identity through digital items such as avatar clothes and accessories, music, photos, and animations in virtual worlds. Since the self-presentation is related to the social desirability (Johnson, 1981), the self-presentation theory incorporates the impression management view and the self-disclosure perspective.

People make efforts to form and to manage impressions, especially when expecting or engaging in the initial stage of interactions (Berger and Calabrese, 1975). Impression management, the process by which individuals attempt to control others' perceptions, is widespread in social interaction (Leary, 1995; Leary and Kowalski, 1990). Most impression management research focuses on face-to-face (FtF) interaction; however, impression management behaviors are not confined to FtF social interaction. Some scholars have concerned how people manipulate, reinvent, or reveal aspects of their identity in virtual communities (Papacharissi, 2002).

Self-disclosure can be defined as any message about the self that an individual communicates to another (Gibbs et al. 2006). On the one hand, its process varies in the different types of relationships in which people are engaged and involved (Joe, 2006). Individuals tend to respond to self-disclosures from others by revealing aspects of their identity (Derlega et al., 1987). Indeed, the act of revealing personal information about oneself to others leads to relational intimacy and satisfaction (Gibbs et al. 2006). Therefore, self-disclosure plays a key role in the type of relationships individuals develop. However, self-disclosure in virtual environments may be less honest because of increased opportunities for self-presentation and identity manipulation (Lea and Spears, 1995; Myers, 1987).

In addition to self-presentation theory, uncertainty reduction theory (Berger and Calabrese, 1975) also pays attention to self-disclosure because people sometimes disclose themselves to reduce uncertainty in the entry phase of interaction. In this manner, avatars representing physical appearance cues can reduce uncertainty about individuals (Nowak and Rauh, 2006). Furthermore, communication facilitates the understanding of others in a social situation and provides procedural knowledge necessary to conduct an interaction.

Interpersonal Trust in Virtual Teams

People trust and respect someone who is trustworthy because of good reasons and evidence. Past studies on trust have suggested that trust is a multidimensional construct that has both cognitive and affective elements consisting of three factors: ability, benevolence, and integrity (Giffin, 1967; Mayer et al., 1995; Ridings et al. 2002). As Kanawattanachai and Yoo (2007) define, cognition-based trust is team members' beliefs about another's ability and reliability to carry out the task. People's baseline expectations for peer reliability and dependability should meet before they will invest further in relationships (McAllister, 1995). On the one hand, affect-based trust is closed to emotion-based trust and is developed from the relationship between friends, colleagues in team, or among family members (Lewis and Weigert 1985; McAllister 1995; Kanawattanachai and Yoo 2002). Consequently, the importance of trust in virtual teams deserves special emphasis because people do not usually meet in person offline.

RESEARCH HYPOTHESES

Visual Representation and Trust

People in virtual worlds can use avatars to represent themselves. Presenting online identity via digital artifacts, they interact with other people. Moreover, digital items sophisticating avatars are like physical possessions and functions as tangible symbols of identity (Kim and Que, 2007). In other words, the sophisticated avatars with digital outfit can represent the team members' talent in virtual environments. Thus, virtual teams tend to rely more on a cognitive than an affective element of trust (Kanawattanachai and Yoo, 2002). Hence, visual representation may influence cognition-based trust.

Hypothesis 1: People feel stronger cognition-based trust with high-sophisticated avatars than low-sophisticated avatars.

Offline Information as a Moderator of Trust

When virtual communities are used within a real and meaningful context, the boundaries between real and virtual are blurred (Talamo and Ligorio, 2001). By uploading a photo or by submitting personal identity information in the offline context, people can communicate their real information in a physical world. The shift to real identities contributes to identify the person who controls the avatar. Self-disclosure is a key component in the development of personal relationships as it fosters closeness (Derlega et al., 1987). In other words, by disclosing their personal information in the virtual community, people become less of a stranger and more of an acquaintance (Ridings et al., 2002). Moreover, disclosure of highly personal information is an important part of interpersonal trust in ability as well as in benevolence and integrity. Thus, personal information may influence initial cognition-based trust.

Hypothesis 2: Offline information disclosure moderates the relationship between visual representation and cognition-based trust.

Cognition-based Trust and Affect-based Trust

Some level of cognition-based trust would be necessary for affect-based trust to develop (McAllister, 1995). Without repeated interaction with others, it is hard to get affect-based trust in the initial stage of the team project or in a short-term relationship. Hence, cognition-based trust may not be significantly related to affect-based trust in the immediate relationship between avatars.

Hypothesis 3: Cognition-based trust does not have a significant influence on affect-based trust in the early stage of relationship development.

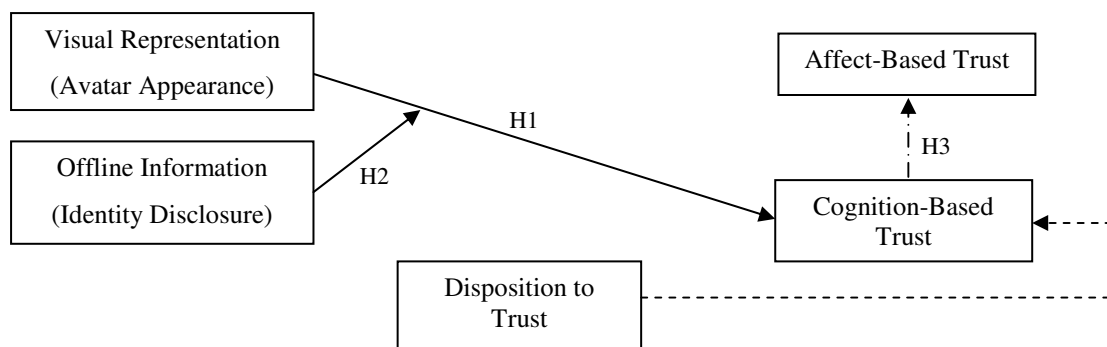


Figure 1. Theoretical Model

Control Variables

Besides the presentation of self and the offline information disclosure proposed in Hypotheses 1-2, we control for the effect of dispositional trust that may influence cognition-based trust. Dispositional trust is the general tendency of an individual to trust other people (Kramer, 1999; McKnight et al., 1998). Since it is easy to cover the actual self in virtual communities, individuals may suspect other members' identity as well as ability. Individuals with low disposition to trust levels tend to be more critical of an object of trust, while those with high levels tend to judge it more positively (Holmes, 1991). Especially, dispositional trust is important in the early stages of a relationship (McKnight et al., 2004). Therefore, dispositional trust in virtual environment may be positively related to cognition-based trust.

RESEARCH METHOD

To control for the effect that the type of characters had on virtual teams, we have employed an experimental design with a scenario-creation method. The scenario is about seeking a new programmer in a virtual team making a film in Second Life. A pretest was conducted that confirmed the nature of the scenario.

- Scenario -

Your team is supposed to make a machinima to show on 'International SL Conference 2010'. Unfortunately, none of your team members is good at Linden Scripting Language (LSL), so you should seek a professional programmer who is trustworthy. You have put a wanted ad in a virtual community of Second Life to offer a programmer job. Now, you need to evaluate and to identify the candidate.

Experimental Design

A laboratory experiment with a 2 × 2 design (i.e., two levels of customization on avatar appearance × two levels of offline information disclosure) was used (Table 1). For the experiment, static pictures, which were screen captured from Second Life, were used. In this case, we did not examine 3D avatar gestures.

	Absence of Offline Information	Presence of Offline Information
Less Sophisticated avatar	Session 1	Session 2
More Sophisticated avatar	Session 3	Session 4

Table 1. Factorial Design

The degree of visual representations was manipulated by showing one of two types of avatar appearance in a virtual environment. The avatar as a visual representative would look (1) less-sophisticated or (2) more-sophisticated. In addition, the levels of offline information disclosure would involve online profiling designed with: (1) absence or (2) presence. For the presence of the real world behind a virtual world avatar, detailed offline profiles and photos were displayed as following Figure 2.

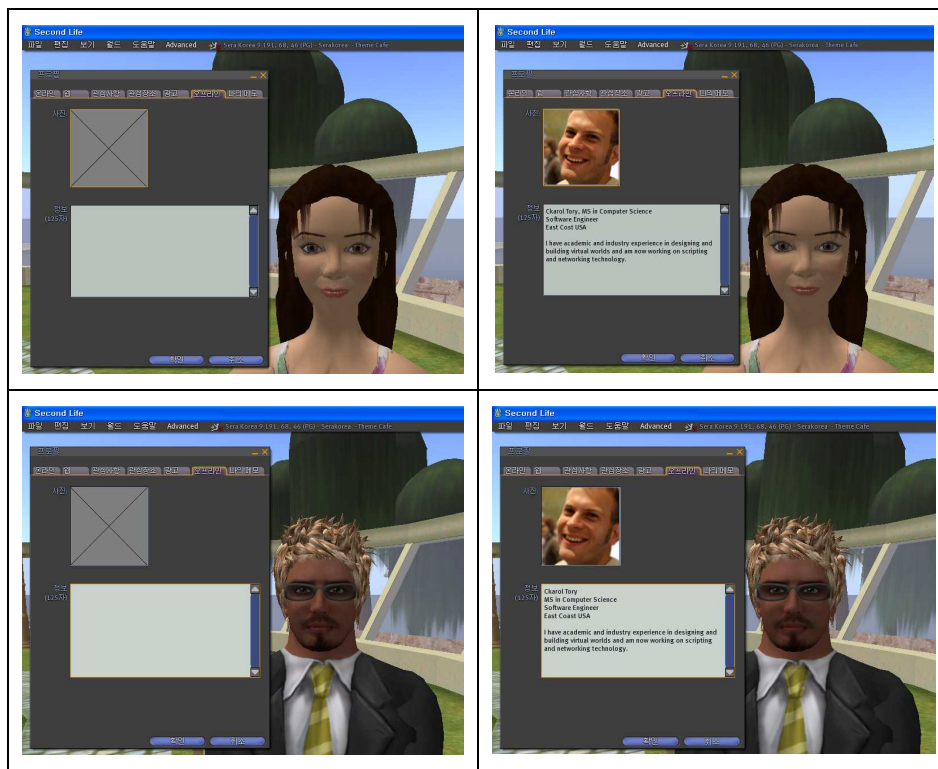


Figure 2. Avatar Appearance and Offline Profile

Experimental Procedure

A total of 20 subjects were recruited from a Korean university campus and randomly assigned to the four avatar conditions, with 4 or 5 in each. Each subject went through only one experimental session. Because two avatars were involved in the experiment, the order by which subjects examined avatars was randomized, such that half of the participants in each treatment examined the male avatar, while the other half examined the female avatar. And also, half of the subjects examined the avatar disclosing offline profile, while the other half examined the avatar hiding offline profile. Each subject was directed to an assigned experiment image, and asked to examine the avatar as if they were interviewing. After examining avatars, the subjects completed questionnaires and got extra credit. All questionnaire items have been pre-tested with good results.

Measurement

Cognition-based trust was measured by testing experimental subjects with questions regarding perceptions of the new member's professional career and expectations for peer reliability, which was developed by McAllister (1995). Also affect-based trust was measured with questions regarding emotional ties, which was developed by McAllister (1995) and by Kanawattanachai and Yoo (2002). In addition, the scale to measure disposition to trust was adapted from Gefen (2000) and McKnight et al (2002). For these trust variables, a 5-point Likert scale was used, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree).

DATA ANALYSIS

Subject Background Information

Among the student subjects, 20 (100 percent) were female and none was male. Seventeen were undergraduate students, and the rest were graduates. The average age of the participants was 23.6. In general, the subjects felt very comfortable with 3D virtual interfaces and were familiar with Second Life.

Results on Cognition-Based Trust

Two-way ANOVA on cognition-based trust suggests that offline profile as well as avatar appearance significantly affect trust as shown in Table 2.

Source	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Between-subjects	3	3.44	11.27	<.001
Offline_Profile	1	2.02	6.61	.021
Avatar_Appearance	1	6.02	19.71	<.001
Offline_Profile x Avatar_Appearance	1	2.34	7.68	.014

Table 2. ANOVA Summary for Cognition-Based Trust

Also it shows the interaction between avatar appearance and offline information disclosure (Figure 3). The significant interaction effect suggests that the effects of visual representation formats are moderated by offline profile level. Therefore, H1 and H2 are supported. The experimental results show that (1) a more sophisticated avatar leads to higher cognition-based trust than a less sophisticated avatar; (2) under a more sophisticated avatar condition, the absence of offline information and the presence of offline information lead to the same level of cognition-based trust; (3) under a less sophisticated avatar condition, the presence of offline information leads to higher cognition-based trust than the absence of offline information.

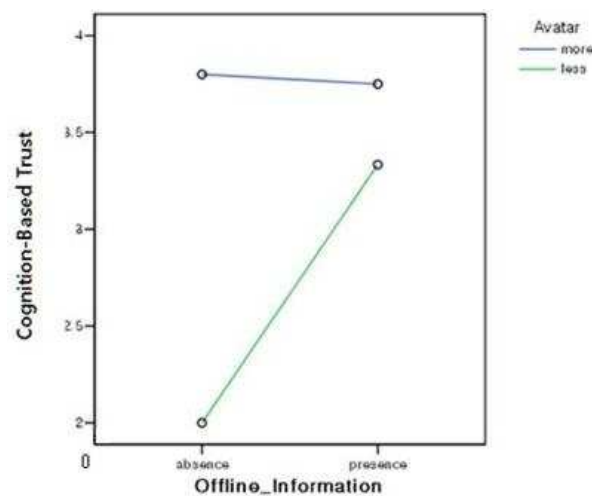


Figure 3. Results on Cognition-Based Trust

In addition, H3 regarding no causal relationship between cognition-based trust and affect-based trust in the initial stage of interactions is supported. This may be because affect-based trust is gradually developed when people start to know each other or have some kind of relationship towards each other for a certain time. Therefore, the experiment cannot detect the effect of affect-based trust in this immediate relationship development between avatars representing team members.

As we expected, dispositional trust was positively related to cognition-based trust. The findings show that if one is willing to trust others in general, he/she would trust others' ability. More interestingly, under the absence of offline information conditions, the relationships between dispositional trust level and cognition-based trust are significantly different as shown in Figure 4. This implies that the personal identity verification via offline profile related to others' ability is more meaningful to those with less trust others in general.

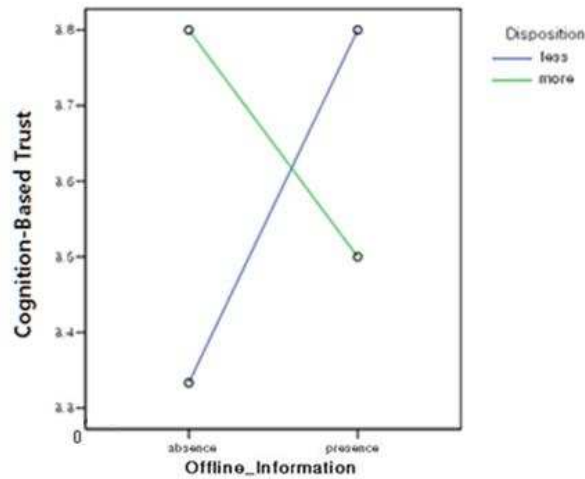


Figure 4. Effects of Dispositional Trust

DISCUSSION AND CONCLUSION

This study has investigated the effects of avatar appearance with digital items and offline profile disclosure on interpersonal trust. It yields important implications for the design of the supporting virtual communities. This study will also increase our understanding of identity verification on cognition-based trust in virtual world collaboration. This understanding of the role of avatar appearance and personal descriptions in virtual environments can potentially shed light on collaboration in virtual teams or virtual communities of practice.

The biggest weakness of this pilot study is the small and biased sample, but the sample would be increased and would be more balanced for the experiment. In addition, since the second session in our experimental design has the identity discrepancy between the avatar gender and the offline gender, there is one further argument that might be considered. Therefore, it would be better to examine the users' perceptions of the same avatar with different outfit. Likewise, it would be interesting to examine whether avatar appearance can fit more offline persons or not.

Since the subjects did not know about the new team member before the experiment, longitudinal research into potential increases in the endurance of interpersonal trust through virtual teams would be another interesting avenue to explore.

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