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THE VALUE OF INFORMATION IN VIRTUAL COMMUNITIES

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Abstract

Virtual communities have become significant applications for the Internet. Previous studies usually treated virtual communities as places for people to share and exchange information and did not explain the social value of communities well. This study treated a virtual community as a stage on which people can present themselves to other users while others can see the shows of people to satisfy their social comparison needs. Based on social comparison theory, this paper investigated the effects of upward social comparison in virtual communities on user satisfaction through the mediations of perceived inspiration and self-improvement. Furthermore, these effects were moderated by individual social comparison orientation. The results of this study should enhance the understanding of the nature and the social value of information in virtual communities.

Keywords: virtual community, social comparison, social value.

1 INTRODUCTION

The Internet provides people with electronic media that can help connect them with each other and form virtual communities. A virtual community, or an online community, is a group of people sharing their interests or goals through electronic media (Dennis et al. 1998). Participants often gather and share information in cyberspace to discuss a topic of common interest (Figallo 1998); their interactions in the community may include expressing ideas, seeking or providing information, expressing feelings, or providing suggestions (Herring 1996). As technology advances, virtual communities also progress, from simple text messaging and discussion boards to adding video and voice capabilities, and with the combination of all related applications in a community website. Participating in communities has been an activity that people engage in on the Internet; a large number of people spend a considerable amount of time in virtual communities.

Previous studies usually treated virtual communities as places for people to share and exchange information, and focused on the problem of why posters want to share information with others (Chan et al. 2004; Ridings and Gefen 2004). Previous studies, however, also found that people who contribute information to the community, and people who search for information may not be the same (Preece et al. 2004; Ridings et al. 2006). Virtual community participants can be divided into posters and lurkers (Blanchard and Markus 2004; Nonnecke and Preece 2000). Although lurkers who seldom reveal themselves and interact with the others are reported to comprise over 90% of communities (Katz 1999; Mason 1999), online community researchers have either shown little interest in lurking or believed that lurking should be stopped (Lee et al. 2006; Preece et al. 2004). Although past studies have argued that lurkers may participate in a virtual community to search for information to help with decision-making, learning, and entertainment purposes, these motivations cannot show the special value of information in the virtual communities, and adequately explain why virtual communities are so unique and attractive to people.

Unlike other sources of information that primarily provide objective information, information in an online community is provided by users and usually regards the subjective experiences and opinions of users. Instead of being perceived as a place for people to share and exchange information, this study perceives a virtual community as a stage on which people can see and be seen by others. The reason why contributors are present in a community may be because sufficient audiences are present. A virtual community provides people with a place to see others. Comparing oneself with others is a natural tendency for humans (Festinger 1954; Suls et al. 2002). Because objective information for evaluation may be unavailable, people usually evaluate themselves by comparing with others.

Helping people compare with others may be a major reason for people to join a virtual community. Based on social comparison theory, this study proposed a model to illustrate the social value of information in a virtual community. Especially for users who seldom provide information to a community, these lurkers are usually less experienced, and the community provides them with a place to gain information of others with a superior performance. This upward comparison can have positive effects on inspiration and self-improvement, subsequently increasing their satisfaction with the community. Furthermore, these mediation effects of inspiration and self-improvement can be influenced by a user's orientation toward social comparison. This study proposed a new perspective on virtual communities and tested the theory in communities for online games. The results may help enhance understanding the nature of virtual communities and the social value of information in the communities.

2 THEORETICAL BACKGROUND

2.1 Virtual Community

Since 1979, the birth of the earliest virtual community, the Usenet newsgroup, virtual communities have been widespread on the Internet (Ridings and Gefen 2004). Numerous people spend a considerable amount of time to find users with the same interest, browse information, and build relationships in virtual communities. A survey found that 84% of Internet users in the United States obtain information from virtual communities, while 79% have at least one most frequently visited community (Horrigan et al. 2001). Virtual communities are a group of people sharing their interests or goals through electronic media (Dennis et al. 1998). For a group of people to be regarded as a community, the participants must participate for a certain time period, and may have emotional attachments to the community (Figallo 1998; Hiltz and Wellman 1997; Ridings and Gefen 2004; AD Smith 1999). Therefore, Rheingold (1993) first defined a virtual community as a social aggregation of people carrying out public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace. Ridings and Gefen (2004) also defined a virtual community as a group of people sharing a common interest or practice in a specific place on the network, proceeding organized communications, and continued for a certain time period under the mechanism.

Virtual communities provide both information and social value to users (Furlong 1989; Hiltz 1984; Korenman and Wyatt 1996; Smith and Kollock 1999; Sproull and Faraj 1997; Wellman 1996). Ridings and Gefen (2004) argued that four major reasons exist for people to participate in a community: information exchange, social support exchange, friendship, and recreation. Past studies usually regarded virtual communities as a place for people to share or exchange information, and focused on issues of why people like to share information with others (Beaudouin and Velkovska 1999; Chan et al. 2004; King 1994). Wasko and Faraj (2000) found that the reputation of an individual and the joy in helping others were the main reasons why users contribute information to a community, and numerous studies have emphasized the importance of trust for information exchange in a community (Hsu et al. 2007; Ridings et al. 2002).

Most of the users in a virtual community, however, do not interact with others through browsing and posting. Although they may express their views occasionally, these users usually maintain silence and hide behind the Internet. Previous studies showed that most of the content is contributed by less than 8% of members in many virtual communities (Katz 1999; Mason 1999). Although not contributing to the community directly, lurking in a virtual community can also be regarded as a form of passive participation (Blanchard and Markus 2004; Nonnecke and Preece 2000). Lurkers are sometimes perceived as free-riders, and therefore, the community should provide a certain mechanism to ensure reciprocity and to encourage lurkers to contribute something in return (Gefen and Ridings 2003; Kollock and Smith 1996; Lee et al. 2006). Past studies showed that users who post and users who search for information within a community may not be the same (Preece et al. 2004; Ridings et al. 2006). Lurkers may not be expected to contribute information to others, and posters may not require any information in return from a community (Huang and Farn 2009). Studies found that lurkers had a significant difference in attitude with posters and they might be shy of displaying themselves in front of the others (Preece et al. 2004; Walther and Boyd 2002).

For users not truly involved in interactions, the perspectives based on reciprocity and exchanging may not be able to illustrate the social value of participating in a virtual community. Information is the most significant resource, and information provided in a community is the chief reason for lurking (Furlong 1989; Jones 1995; Wellman 1996). Lurkers may browse a community to search for information to help with decision-making, learning, and even for entertainment purposes. These motivations, however, cannot reveal the special features of information provided by other users in a community, and the social value of virtual communities for lurkers. A virtual community provides a place for people to see the opinions and experiences of others. Therefore, this study uses social comparison theory to explain why users browse information in virtual communities, and illustrates the special value of information in virtual communities for users.

2.2   Social Comparison Theory

Social comparison consists of comparing oneself with others to evaluate or enhance certain aspects of the self (Suls et al. 2002). Comparing oneself with others, intentionally or unintentionally, is a pervasive social behavior and a significant part of the human experience (Festinger 1954; Suls et al. 2002). Social comparison theory posits that people require information to evaluate their opinions and abilities; if they cannot obtain objective information for these purposes, comparing themselves to others is one major approach to satisfy this need for self-evaluation (Festinger 1954).

Social comparison can be upward or downward. Downward comparison theory, proposed by Wills (1981), suggests that when people feel threatened, they tend to compare with those who are worse off than themselves, and comparing with someone in a worse situation can boost the subjective wellbeing of an individual (Wood et al. 1985). This positive effect on self-enhancement is significant for social and health psychology (Gibbons and McCoy 1991; Suls et al. 2002). For example, an ill person may feel not that bad when they meet someone with a more serious disease (Van der Zee et al. 1996). Comparing oneself with someone in a worse situation may also help people rid themselves of bad habits (Gibbons and Eggleston 1996). Upward comparison is comparing oneself with those who are better in status, capability, or having more achievements. Traditional theory of social comparison argues that upward comparison renders people to feel that they belong to a bad group, and negative affects subjective wellbeing (Suls et al. 2002). According to the self-evaluation maintenance model, people with an upward comparison should pay attention to maintaining self-evaluation (Tesser 1988; Tesser and Paulhus 1983). The theory further posits that the threat of upward social comparisons on self-evaluation is large when an individual is outperformed by someone who is relevant or psychologically similar, or when they are outperformed in a critical domain (Pelham and Wachsmuth 1995; Tesser and Collins 1988).

Upward social comparison, however, can also cause positive responses through self-improvement and inspiration (Buunk and Gibbons 2007; Suls et al. 2002; Wood 1989). Inspiration refers to individuals triggered by a target object and actively changing toward an improved direction (Thrash and Elliot 2003). If people perceive similarity with upward targets, they can be inspired and sense that they can have the same achievement that superior targets have accomplished (Lockwood and Kunda 1997; Thrash and Elliot 2003). Exposure to upward targets increases self-evaluations of competence and motivation when individuals believe in the possibility of change in their statuses (Lockwood and Kunda 1997). Studies have also found that people intentionally compare themselves with others who are superior, and that such comparisons positively affect the self-view (Collins 2000; Wheeler 1966). Therefore, humans like to read stories or biographies of successful people and these stories may act as a psychological inspiration, such as, "If they can do it, I can as well." Individuals who want to be thin can place photos of thin people on their refrigerators to remind themselves not to eat too much (Collins 1996). This inspirational effect can be more dramatic if the story is of a person with a similar background (Lockwood and Kunda 1997). Except for the positive effect on inspiration and self-evaluation, an upward comparison can also direct people on self-improvement (Buunk and Gibbons 2007; Wood 1989). An individual may watch others who are more skilled or accomplished, hoping to learn from them (Berger 1977). "How-to" books based on the stories of others are popular in the market (Wood 1989). When people want to improve their current situation, they find a role model through upward comparison. For example, young children often compare themselves with other children to learn how to perform tasks (Feldman and Ruble 1977).

Although comparing oneself with others is a common behaviour among people, people show differences in tendencies for comparing with others (Hemphill and Lehman 1991). Gibbons and Buunk (1999) developed a scale of social comparison orientation to measure individual social comparison tendency, which was divided into ability comparison and opinion comparison orientation. Ability comparison refers to comparing with others on performance, while opinion comparison is related to assessing the opinions of others. Later studies found that people with high social comparison orientation compare with others more frequently, and are more strongly affected by social comparison information (Buunk and Gibbons 2007; Buunk et al. 2005). The tendency to compare with others is also affected by social context. People are more likely to compare with others when

they can compare in private instead of in public (Gibbons et al. 2002; Smith and Insko 1987; Wilson and Benner 1971; Ybema and Buunk 1993). Social comparison, especially for downward comparison, may be perceived as socially undesirable, and people are often reluctant to admit that they compare themselves with others (Brickman and Bulman 1977; Wills 1981). Conversely, people are more likely to compare with upward targets when social comparison does not require people to actually establish contact with the targets and reveal the risk of others looking down on them (Buunk 1995; Buunk et al. 1994).

Social comparison also plays an essential role in consumer purchasing decisions (Luo 2005; Rook 1987; Zhang et al. 2006). People may consciously or subconsciously compare their choices with others and are sensitive to social comparison cues relevant to their choices (Bearden and Rose 1990). People may also select a person or a group to serve as a reference group for comparison (Khan and Khan 2005). People in the past, however, only had access to limited information and compared only with people nearby, or the figures in advertisements or mass communication media. Today the Internet has broadened the worldview of people. Virtual communities provide people with a private and secure place to see and present themselves to others to satisfy their needs for social comparison and self-presentation.

3 RESEARCH MODEL

Among the different types of online communities, those for interest may be the most popular (Armstrong and Hagel 1996). For example, Gamer.com (http://www.gamer.com.tw), which is an online community for users interested in animation, comics, and games (ACG), was ranked by network traffic as the sixth largest website in Taiwan in 2009 (http://www.alexa.com). Because numerous online game players may also participate in online communities to discuss and seek information, this study examined participants in communities for online games to test the theory for the social value of lurking.

The positive effects brought on by social comparison may be a major reason for people to browse a community, and these effects increase the satisfaction of participants on the community. Previous studies usually treated a virtual community as a place for people to share or exchange information. Past research, however, has shown that users who post and users who search for information in a community may not be the same (Preece et al. 2004; Ridings et al. 2006). Conversely, a community can be a stage for someone to stand on and show up themselves, and for others to sit under it to see the shows of others. Although users with less experience may sometimes post questions on the community, most of the responses and comments on the community are posted by users who are more experienced or perform better and are the upward targets for lurkers to be compared with. Those lurkers, who seldom post anything in the community, may not need to provide information to the posters in feedback; all they need to do may be to applaud sometimes so the posters will know where the audiences are.

Game players typically bring their skills, knowledge, judgment, and passion in a game while being motivated by a desire for achievement. In modern online games, players create avatars for themselves to accomplish tasks in a virtual world, and they can show their abilities via their avatars. The utility of playing the game may depend on how players can use in-game artifacts well to present themselves (Campbell 2005). Most players want to know what they can do and how they can enhance their performance in the game. These users can look for experiences and stories of someone with superior performance in online communities. This upward social comparison positively effectuates a browser's inspiration and self-improvement (Wood 1989); they achieve a higher self-evaluation, set a higher target for themselves, and also learn how to improve their in-game performance. Therefore, this study hypothesized that:

H1a: Upward social comparison in an online community can inspire participants.

H1b: Upward social comparison in an online community can increase the self-improvement belief of participants.
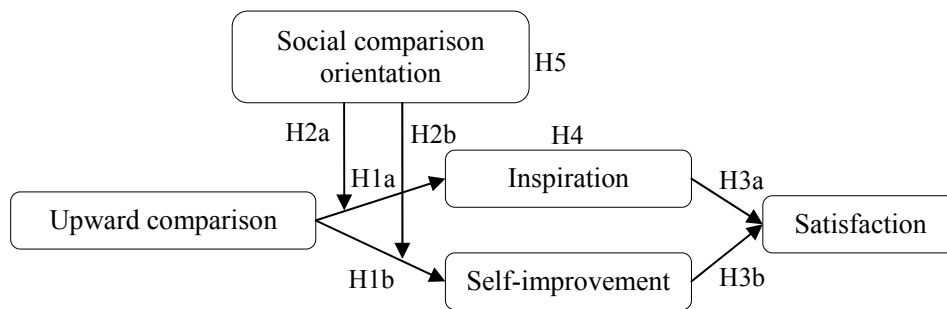
Figure 1. Research Model

People show differences in the tendency for comparing with others (Hemphill and Lehman 1991). Those who have high social comparison orientation compare with others more often, and are more strongly affected by social comparison information (Buunk and Gibbons 2007). Therefore, individual social comparison orientation increases the effects of upward social comparison on inspiration and self-improvement in an online community, and we proposed the hypothesis that:

H2a: Individual social comparison orientation positively moderates the effects of upward social comparison in an online community on inspiration.

H2b: Individual social comparison orientation positively moderates the effects of upward social comparison in an online community on self-improvement.

Users may join an online game community for information regarding what they can do and how they can accomplish a task in a game. The positive experience of inspiration and self-improvement satisfies this need and increases user satisfaction of lurking in the community. Therefore, this study hypothesized that:

H3a: The experience of inspiration in an online community positively affects a person's satisfaction with the community.

H3b: Gaining self-improvement belief in an online community positively affects a person's satisfaction with the community.

If the effects of Hypothesis 1 and Hypothesis 3 are sufficiently large, upward social comparison may positively affect user satisfaction in an online community through its influences on inspiration and self-improvement. So we proposed the hypothesis that:

H4: Upward social comparison in an online community positively affects a person's satisfaction with the community through the mediation effects of inspiration and self-improvement.

The research model is illustrated in Figure 1. Muller et al. (2005) proposed the distinction between moderated mediation and mediated moderation proposed. If upward social comparison primarily affects satisfaction through the mediations of inspiration and self-improvement, which are moderated by individual social comparison orientation, then the total effect of upward social comparison on user satisfaction may also be moderated by social comparison orientation. This is the case of mediated moderation proposed by Muller et al. (2005). Conversely, the moderated mediation model assumes while individual social comparison orientation affects the indirect effects of upward social comparison on satisfaction, it may also inversely affect the residual direct effect; therefore, the total effect is not affected. Assuming the model we proposed has captured the primary effects of social comparison on user satisfaction, this study presents the following mediated moderation hypothesis to further explore the effects of social comparison in an online community:

H5: Individual social comparison orientation moderates the total effect of upward social comparison on user satisfaction, and this moderation effect is mediated by the inspiration and self-improvement one can obtain in an online community.

4   RESEARCH METHOD

We conducted an online survey to test the proposed model. Upward social comparison was defined as the behaviors of participants for paying attention to and comparing with other members in the community who have superior skills, abilities, and achievements. We followed the criteria proposed by Buunk et al. (1990), developing a scale with five items to measure upward social comparison in an online community. Satisfaction was measured with four items revised from a Chinese instrument that was used and tested in a previous study (Lin et al. 2006). Inspiration was measured with three items revised from the scale developed by Thrash and Elliot (2003) to ask of the experiences of participants in the community; one item in the original scale was dropped because it was too similar to another one after translation.

Because no instrument exists for the belief of self-improvement, this study adopted the Personal Growth Initiative Scale (PGIS) to measure self-improvement (Robitschek 1998). PGIS is a 9-item instrument that measures an individual's active engagement in the process of self-change. This cognitive, behavioural, or affective change is regarded as a positive, with movement in the direction of being more complete or fully functioning (Patterson and Welfel 1994; Prochaska and DiClemente 1986). One item in the original scale was inadequate for gamers; the item was thus dropped, resulting in a scale with eight items. Finally, social comparison orientation was measured by the Iowa-Netherlands Comparison Orientation Measure (INCOM), an 11-item scale developed by Gibbons and Buunk (1999). The INCOM comprises items for ability and opinion comparisons orientation. All the abovementioned measurements use a 7-point Likert scale. A pretest with 40 subjects experienced in online games and online communities was conducted to examine the wording on the items and to test the online survey system. Measurement items used in the study are listed in the appendix.

We posted invitations in three popular discussion boards for online games in PTT (http://www.ptt.cc) to invite members to take part in the study. PTT is a non-commercial platform established in a university in Taiwan, and now owns the biggest Electronic Bulletin Board System in Chinese, with more than 300,000 concurrent users during peak time. Like most online communities, users in the PTT system are anonymous. This study offered a drawing for ten 450 TWD prepaid cards of a big online game company as an incentive for valid respondents, especially for users who are not used to actively participating. Respondents were required to be experienced with playing online games and participating in online communities for the games they played. Finally, 417 valid responses were obtained, and the sample descriptions are shown in Table 1. Affected by the topic of the communities this study selected, 81.77% of the sample comprised males, 72.24% were students, and more than 90% were aged between 19 and 28. Furthermore, most of them were significantly experienced in playing online games and also spent a considerable amount of time playing games.

	Number	Percent		Number	Percent
Gender			Occupation		
male	341	81.77%	employed	70	16.79%
female	76	18.23%	student	302	72.42%
Age			other	45	10.79%
under 15	1	0.24%	Time spent on playing online games each day		
12-18	12	2.88%	under 1 hour	21	5.04%
19-23	241	57.79%	1-2 hours	93	22.30%
24-28	148	35.49%	2-3 hours	117	28.06%
29-35	13	3.12%	3-4 hours	90	21.58%
above 36	5	0.48%	more than 4 hours	96	23.02%
Experience in playing online games			Time spent on communities for games each day		
less than 1 year	16	3.84%	under 15 minutes	39	9.35%
1-3 years	41	9.83%	15-30 minutes	141	33.81%
3-5 years	88	21.10%	30-60 minutes	133	31.89%
5-7 years	93	22.30%	more than 60 minutes	104	24.94%
more than 7 years	179	42.93%			

Table 1.   Sample Descriptions

5 RESULTS

A principal components analysis with orthogonal rotation was conducted to examine the measurement model. Factors with eigenvalues larger than one were extracted, and the results of the factor analysis are shown in Table 2. Two reversed items in the social comparison orientation were dropped because they were loaded in another factor. Another item in self-improvement was dropped because its highest loading was less than 0.5. Except for the aforementioned exclusions, the remaining items were loaded as predicted. The Cronbach's α of the variables are also shown in Table 2, and they are all larger than 0.7. These results show that the obtained measurement has acceptable reliability and validity. The Harman's one factor test shows the first factor accounts for 29.74% of total variance in exploratory factor analysis. This finding thus partially allays the concerns about common method bias for this study.

We conducted hierarchical multiple regressions to test the hypotheses with mediating and moderating effects. The centering means that subtracted the mean from each score prior to transforming into the multiplicative term in the regression models were used to avoid the problem of multicollinearity. The results of the regressions on inspiration and self-improvement are shown in Table 3; Model 1 and Model 3 tested the effects of independent variables on inspiration and improvement, and Model 2 and Model 4 tested the moderating effects of ability and opinion comparison orientation. The results of the regressions on satisfaction are shown in Table 4. To check the mediating hypothesis, Model 5 tested

Item	\multicolumn{7}{c	}{Exploratory Factor Analysis [a]}	Variable and Cronbach's α
	1	2	3	4	5	6	7	
UC1			0.775					Upward comparison
UC2			0.773					0.852
UC3			0.690					
UC4			0.645					
UC5			0.628			0.428		
INS1						0.738		Inspiration
INS2						0.830		0.883
INS3						0.815		
SA1				0.654				Satisfaction
SA2				0.749				0.905
SA3				0.757				
SA4				0.656				
SI1 [b]	0.488							Self-improvement
SI2	0.641							0.867
SI3	0.611							
SI4	0.583							
SI5	0.707							
SI6	0.756							
SI7	0.640							
SI8	0.690							
SCO1					0.763			Ability comparison orientation
SCO2					0.667			0.791
SCO3					0.643			
SCO4					0.806			
SCO5 [b]					0.443		0.624	
SCO6					0.707			
SCO7		0.715						Opinion comparison orientation
SCO8		0.785						0.859
SCO9		0.797						
SCO10		0.646						
SCO11 [b]		0.410					0.714	

a: Standardized Factor loading; value less than 0.4 are suppressed.
b: The item was dropped after exploratory factor analysis.

Table 2.   Measurement Model

the effects of two mediation variables on satisfaction, Model 6 tested the effect of independent variable, and the influences of two mediation variables were added in Model 7. Finally, Model 8 and Model 9 tested the moderating roles of social comparison orientation on satisfaction. Because the respondents' age, time spent in playing online games, and experience in playing online games may reflect how they were engaged in playing online games and affect their reactions to the community, we added these variables into the regression models as control variables.

Model 1 and Model 3 show that upward comparison significantly affects inspiration and self-improvement; both H1a and H1b are supported. The F test for the R2 differences between Model 2 and Model 1 is significant. Opinion comparison orientation positively moderates the effects of upward comparison on inspiration, as predicted in H2; ability comparison orientation, however, shows a negative moderating effect. The positive effects of upward comparison on inspiration decrease for people with higher ability comparison orientation. Certain arguments still exist regarding the influences of upward comparison in studies of social comparison. The results of this study suggest that the effects of upward comparison are influenced by whether a person focuses on ability or opinion comparison; the positive effect is larger for people focusing on opinion comparison, and is lesser for people focusing on ability comparison. The results of Model 4 show that the moderating effects of comparison orientation on the impact of upward comparison on self-improvement are not significant; H2b is thus not supported.

Model 5 shows that both the effects of inspiration and self-improvement on user satisfaction are significant; H3a and H3b are hence supported. Model 6 shows that upward comparison positively affects user satisfaction. The impact of upward comparison decreased as inspiration and self-improvement were added in Model 7 as independent variables. Following the rule suggested by Baron and Kenny (1986), this result shows that upward comparison affects user satisfaction through the mediations of inspiration and self-improvement. The rule proposed by Baron and Kenny, however, cannot test if the indirect effect is significant. Preacher and Hayes (2008) suggested that if multiple mediators are present in a model, the total effects of all mediators should be tested collectively, instead of separated testing by the Sobel test. This study employed the bootstrapping method and the SPSS macro provided by Preacher and Hayes (2008) to test the model with two mediators. The results show that the 95% bias-corrected and accelerated confidence intervals of the indirect effects of inspiration and self-improvement, inspiration only, and self-improvement only, are (0.168, 0.306), (0.092, 0.196), and (0.050, 0.144), respectively. Because these intervals do not contain zeros, the indirect effects are all significant, and H4 is thus supported.

Model 8 shows that neither ability nor opinion comparison orientation moderate the impact of upward

Dependent variables	Inspiration				Self-improvement			
	Model 1		Model 2		Model 3		Model 4	
	β	t	β	t	β	t	β	t
Age	-.07	-1.67	-.05	-1.21	.07	2.00*	.08	2.00*
Game time	.00	0.02	.01	0.18	.09	2.33*	.09	2.30*
Game experience	-.02	-0.40	-.00	-0.08	.02	0.66	.03	0.67
Upward comparison	.45	9.65**	.46	10.14**	.42	10.23**	.42	10.17**
ACO	.09	2.02*	.12	2.73**	.00	0.08	.00	0.07
OCO	.10	2.14*	.13	2.88**	.36	8.88**	.37	8.71**
ACO' x Upward comparison'			-.14	-2.91**			.00	0.01
OCO' x Upward comparison'			.21	4.21**			.02	0.34
R^2	.28		.31		.44		.44	
adjusted R^2	.27		.30		.43		.43	
F(df1/df2)	26.53 (6/410)**		23.02 (8/408)**		53.40 (6/410)**		39.89 (8/408)**	
ΔR^2			.03				.00	
F(df1/df2)			9.29 (2/408)**				0.08 (2/408)	

** p <0.01, * p <0.05, N=417
ACO: Ability Comparison Orientation; OCO: Opinion Comparison Orientation
': The centered mean

Table 3.   Regressions on Inspiration and Self-improvement

	Model 5		Model 6		Model 7		Model 8		Model 9	
	β	t	β	t	β	t	β	t	β	t
Age	-.00	-0.12	.00	0.05	.01	0.20	.01	0.29	.01	0.35
Game time	.06	1.46	.07	1.71	.04	1.20	.08	1.87	.05	1.48
Game experience	-.06	-1.55	-.07	-1.56	-.06	-1.62	-.05	-1.24	-.05	-1.50
Upward comparison			.54	12.85**	.21	4.50**	.42	9.74**	.18	3.76**
ACO							.01	0.25	-.03	-0.81
OCO							.28	6.26**	.15	3.52**
ACO' x Upward comparison'							-.04	-0.78	.01	0.28
OCO' x Upward comparison'							-.01	-0.31	-.09	-2.05*
Inspiration	.40	9.66**			.33	7.70**			.34	7.90**
Self-improvement	.38	9.24**			.29	6.52**			.21	4.49**
R^2	.44		.31		.47		.38		.50	
adjusted R^2	.44		.30		.46		.37		.49	
F(df1/df2)	65.47 (5/411)**		45.22 (4/412)**		60.48 (6/410)**		30.85 (8/408)**		40.12 (10/406)**	
ΔR^2					.16				.12	
F(df1/df2)					63.54 (2/410)**				48.50 (2/406)**	

** p <0.01, * p <0.05, N=417
ACO: Ability Comparison Orientation; OCO: Opinion Comparison Orientation
': The centered mean

Table 4.   Regressions on User Satisfaction

comparison on user satisfaction. Therefore, H5 was not supported. This study further tested competing hypothesis of H5, which is the moderated mediation model that hypothesizes the indirect effects of upward social comparison on user satisfaction through the mediations of inspiration and self-improvement are moderated by individual social comparison orientation. Moderated mediation implies that an indirect effect between the treatment and the outcome depends on the moderator, thereby controlling for the mediator the residual direct treatment effect on the outcome (Muller et al. 2005). Model 9 shows that after controlling the effects of inspiration and self-improvement, the moderating effect of opinion comparison orientation was significant, satisfying the criteria proposed by Muller et al. (2005). This study further tested whether opinion comparison orientation moderates the indirect effect of inspiration by employing bootstrapping method and the SPSS macro provided by Preacher et al. (2007). The confidence intervals for the indirect effect with the largest and the smallest values of opinion comparison orientation did not overlap ((0.158, 0.330) and (-.058, 0.132)), indicating that the moderated mediation effect is significant, and the moderated mediation hypothesis is thus supported. The results show that opinion comparison orientation increases in conjunction with the indirect effect of upward comparison on satisfaction through inspiration, whereas the direct effect decreases; the indirect effect subsequently becomes insignificant if opinion comparison orientation is too small.

6   CONCLUSIONS

Previous studies on virtual communities argued that people may seek information in a virtual community for decision-making, entertainment, and learning purposes, though these perspectives cannot demonstrate the special social value of this online information, which is provided by and usually regarding other users. Conversely, when regarding the social value of participating in a virtual community, previous studies usually assumed that social value is derived from people interacting with others, though most participants in a community do not truly interact with others through reading and posting messages. This study assumed that online communities are places for people to gain information of others to satisfy their social comparison need, and proposed a model based on social comparison theory to investigate the impact of upward social comparison on user satisfaction. The results show that the proposed model can explain nearly a half of the variance of user satisfaction, and that benefits brought by social comparison can be a major reason for participating in an online community.

This study found that upward social comparison in a virtual community affects user satisfaction through three paths. Firstly, upward comparison increases the inspiration of users, followed by user

satisfaction. Previous studies seldom mention the positive impact on inspiration for participating in a virtual community. This positive effect decreases when people focus on ability comparison, and increases when people focus on opinion comparison. Secondly, upward comparison increases user satisfaction through its effects on the belief of self-improvement. This effect is rather similar to the past explanation of the value of information in a community, and this effect is not affected by individual social comparison orientation. Finally, upward social comparison also increases user satisfaction directly, or through the influence of a missing mechanism. The effect of this path decreases for people with higher opinion comparison orientation.

This study found that ability and opinion comparison orientation result in different moderating effects on inspiration, though individual comparison orientation does not moderate the total effects of upward comparison on user satisfaction. Except for the moderating effects, previous studies also argued that people with higher comparison orientation compare with others more frequently (Buunk and Gibbons 2007; Buunk et al. 2005). In addition, the results also show that upward comparison was significantly correlated with both ability and opinion comparison orientation. Past studies found social comparison orientation to be related to certain personal characteristics (Gibbons and Buunk 1999). People with higher social comparison orientation have stronger self-consciousness and empathy for others; they are more interested in the feelings of others and are more sensitive to their needs, and these tendencies are all related to the interpersonal orientation of an individual (Swap and Rubin 1983). Furthermore, social comparison orientation is also associated with communal orientation, which is the tendency that people need other people and intend to help them (Gibbons and Buunk 1999). If a virtual community is a place for people to satisfy their social comparison needs, these characteristics may also relate to how and why people participate in it. The impacts of individual social comparison orientation, however, still require further studies for verification.

Although the findings of this study showed the value of social comparison theory for explaining the special value of information in online communities, certain limitations were present that would affect the generalizability of the findings. Firstly, the respondents in this study were voluntary, and this study provided incentives to encourage users to participate. These incentives, however, may result in a bias in the sample. Secondly, the subjects in this study were users of PTT discussion boards for online games. Affected by the topics of the communities, most respondents of the study were male students. Furthermore, PTT is an extremely popular system among university students in Taiwan. The composition of the sample may thus be inconsistent with the compositions of other online communities. Thirdly, this study is a survey research where respondents were required to self-evaluate their upward comparison experiences in a community, though comparing with others may be an unconscious process, and most previous studies on social comparison were conducted by experiment (Suls et al. 2002). Future studies can explore the effects of unconscious comparisons in a virtual community using experimental methods. Finally, an online community is a place in which people can see others, and provides people with benefits of upward comparison. This argument of upward comparison assumes that people can show differences in their skills, abilities, experiences, and achievements and this assumption may be false for certain communities.

For communities in which people can show their achievements in a field, however, those members who stand up in front of the audience are likely to be people with higher achievement and they can be the targets of upward comparison for the others. Watching the performance of others in YouTube may motivate people to achieve a better result. Joining a virtual consumer community may encourage people to buy more to be comparable to others. These effects of virtual communities are interesting issues for future studies. On the other side, differencing with traditional view of sharing and exchanging information, we still need a better explanation of self-presentation for people who stand on the stage of the communities. Unlike people in the social network sites such as Facebook, people in virtual communities are usually anonymous. Future studies can also examine the effects of anonymity on self-presentation and social comparison.

Appendix.   Measurement Items

Upward Comparison

UC1. When I browse the community, I pay attention to what people who play the game better than me are doing.
UC2. When I browse the community, I pay attention to what people with more experience in the game than me are doing.
UC3. When I browse the community, I pay attention to the achievements of others in the game.
UC4. When I browse the community, I compare myself with users who play the game better than me regarding how we play the game.
UC5. When I browse the community, I compare myself with users who have superior achievements in the game.

Inspiration

INS1. I am inspired when I browse the community.
INS2. Something I encounter or experience in the community inspires me.
INS3. I am inspired to take action when I see others in the community.

Satisfaction

SA1. My experience in browsing this community is good.
SA2. Browsing the community is worthwhile.
SA3. I have made a right choice to browse this community.
SA4. Overall, I am satisfied with this community.

Self-improvement

SI1. I know how to change specific things in the game.
SI2. I have a good sense of where I am headed in the game.
SI3. If I want to change something in the game, I initiate the transition process.
SI4. When I play the game, I can choose the role that I want to have in a group.
SI5. When I play the game, I know what I must do to start reaching my goals.
SI6. When I play the game, I have a specific action plan to help me reach my goals.
SI7. I am in control of my life in the game.
SI8. When I play the game, I know what my unique contribution to my group might be.

Social Comparison Orientation

SCO1. I often compare how my loved ones (boyfriend or girlfriend, family members, etc.) are doing with how others are doing.
SCO2. I always pay a lot of attention to how I do things compared with how others do things.
SCO3. If I want to find out how well I have done something, I compare what I have done with others.
SCO4. I often compare how I am doing socially (e.g., social skills and popularity) with other people.
SCO5. I am not the type of person who often compares with others (reversed).
SCO6. I often compare myself with others regarding what I have accomplished in life.
SCO7. I often like to talk with others on mutual opinions and experiences.
SCO8. I often try and find out what others think when facing similar problems.
SCO9. I always like to know what others would do in a similar situation.
SCO10. If I want to learn more on something, I try and find out what others think.
SCO11. I never consider my situation in life relative to that of other people (reversed).

Note: All the items used in this study are in Chinese.

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