

The Virtues of Taiwanese Internet-Using Adolescents: The Development and Validation of the Cyber Virtues Scale

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(Submitted July 1, 2016; Revised December 17, 2016; Accepted December 27, 2016)

ABSTRACT

Given the importance of cultivating users' positive behaviors in cyberspace, this study presents a comprehensive vision of how to address important virtues that might foster Taiwanese adolescents' positive behaviors in cyberspace. In this study, we constructed an instrument—the Cyber Virtues Scale (CVS)—for measuring the underlying dimensions of Taiwanese adolescents' virtuous behaviors in online settings. Research data were gathered from 607 elementary and junior high school students in different Taiwan's geographic areas. The CVS model has been empirically validated via exploratory factor analysis. The final version of the CVS consists of 5 core virtues in cyberspace: interpersonal interaction, knowledge accumulation, social justice, information sharing and self-discipline. These results will also strengthen the digital generation by cultivating their positive behaviors in cyberspace.

Keywords

Cyber ethics, Cyber virtues scale, Scale development, Virtue

Introduction

The necessity of virtues' implementation in Cybersociety

In recent years, the rapid development of information technology has deeply influenced human lives. At the same time, we have seen continual changes in the moral circumstances of communities and individuals. Cyberspace-based society may change adolescents' virtues and character development in particular (Chang & Chou, 2015; Dillon, 2010). This change may promote moral judgments and behaviors that, in cyberspace, are much different from those in traditional offline societies.

Indeed, McMahon and Cohen (2009) argued that adolescents' virtues in cybersociety are in great need of improvement mainly because laws governing behavior in cybersociety are both ineffective and unclear for adolescents. In other words, cybersociety seems to have difficulty in keeping up with the quickly advancing Internet world. Thus, when laws or regulations of cybersociety are lacking, personal virtues tend to become people's main behavioral guidepost. However, adolescents have likely neither developed a comprehensive set of virtues nor reached an adequate level of moral maturity to handle the complicated moral conditions and dilemmas that arise in online spaces (Qi & Tang, 2004; Voiskounsky, 2004). A related issue is whether adolescents can apply their virtues from offline reality to cybersociety.

Users of cybersociety frequently abuse network technology. More specifically, adolescents have many chances to experience or engage in such problematic or unhealthy cyberspace-based behavioral patterns as Internet addiction (Chou, 2001; Tsai & Lin, 2003), Internet hacking, network rumor-mongering (Hanson, 2000; Stafford, Kline, & Dimmick, 1999), cyberbullying (Huang & Chou, 2010; Huang & Chou, 2013), Internet crimes (Selwyn, 2008; Stephens, Young, & Calabrese, 2007), and digital plagiarism (Butakov & Scherbinin, 2009; Ma, Wan, & Lu, 2008). For example, Suler (2004) stated that the "online disinhibition effect" and such Internet attributes like anonymity, disembodiment, and intimacy might encourage people to take greater risks and to act more unscrupulously in online spaces than in offline spaces. Therefore, adolescents are likely to engage in problematic behaviors on the Internet (Orgad, 2007; Selwyn, 2008; Suler, 2004).

Thus, with such changes in social contexts, namely with the rapid rise of cyberspace, one's criteria for moral judgments may also change. Such transformation of moral judgment criteria contributes to a situation where people's behavior in cyberspace differs from that in traditional offline societies, thus raises the issue of how society should guide adolescents' development of moral judgments and moral behaviors in cyberspace (Voiskounsky, 2004). In other words, the implementation of virtues in Internet society is necessary and important (Voiskounsky, 2004; Stephens et al., 2007; Vallor, 2010; Yang, 2006).

The positive aspects of Cybersociety's values

Past studies seem to focus more on online students' negative behaviors and these behaviors' negative effects (e.g., Huang & Chou, 2010; Selwyn, 2008; Stephens et al., 2007). Rather than address the theme of network-based harm, researchers have emphasized the Internet's positive social functions (e.g., Amichai-Hamburger & Furnham, 2007; Orgad, 2007; Rouis, Limayem, & Salehi-Sangri, 2011; Yu & Chou, 2009). These studies suggest that it is important not to ignore the possible progress that cyberspace can bring about. Thus, more attention should be turned from exploring the Internet's negative values to exploring its positive aspects. Researchers interested in this objective should explore, promote, and develop users' individual virtues, which can strengthen the Internet's positive value for these users. Given the importance of cultivating users' positive behaviors in cyberspace, this paper presents a comprehensive vision of how to address important virtues that can foster adolescents' positive behaviors in cyberspace.

Past research on virtues in Cybersociety

The virtues mentioned in the previous investigations have been conceptualized mainly in reference to real society — that is, the offline world. Since cyberspace is a particular social context, we should consider that the content of virtues should be re-examined in the context of cyberspace. Furthermore, many studies indicated the problem of ethical dilemmas that may take place on the Internet (Chang & Chou, 2015; McMahon & Cohen, 2009), and proposed that the character-based of virtue ethics could be a solution. However, there is no consensus on what kinds of virtues should be fostered.

Gray and Tejay (2014) examined five cardinal virtues, *Astuteness*, *Conviction*, *Rectitude*, and *Self-Discipline*, which influence the ethical behavior of trusted workers and ultimately Information System security. Willard (1997) identified respect as the most important Internet ethics issue that parents and educators must address. He argued that people in cyberspace must respect each other's privacy and property. Ang and Goh (2010) examined empathy and cyberbullying among 396 adolescents from Singapore and suggested the need for empathy training in reducing cyberbullying behavior among adolescents. In addition, Rouis et al. (2011) surveyed 239 undergraduate students and indicated that self-regulation strengthened students' control over their online social behavior. The above-mentioned studies suggest that virtues critical for cyberspace include respect, responsibility, self-restraint, honesty, law-abidance, equality, care, and philanthropy. However, exploring cyberspace virtues as a research field has not yet taken firm hold among scholars. In this regard, we should rigorously examine which virtues are crucial traits for the digital generation by measuring adolescents' virtuous behaviors in online settings.

The goal of the current study

In recent years, the issue of virtuousness among adolescents has received heightened attention from educators and parents. Character education focuses on learners' development of virtues (i.e., moral behaviors and attitudes) (Chang & Chou, 2015; Vallor, 2010). The first step in building this theoretical framework is to identify core virtues and develop valid and reliable measurement tools (Park & Peterson, 2006).

However, how can virtues be objectively measured by self-reported online behavior surveys? The relative researches showed that virtues can be objectively measured via self-reported surveys. Steen, Kachorek and Peterson (2003) indicated virtues as individual differences that exist in degrees. The individual differences can be assessed in ways. Aldridge, Ala'i, and Fraser (2016) developed self-reports of ethnic and moral identity in high schools in Western Australia. Cawley III, Martin and Johnson (2000) developed virtues scale by using a sample of 390 participants and the results support a 140-item self-report measure comprising four factors: Empathy, Order, Resourcefulness, and Serenity. Park and Peterson (2006) developed the Values in Action for Youth (VIA-Youth) which features the comprehensive self-report assessment of the 24 virtues among adolescents. These traditional virtues are widely accepted for offline societies. Because cyberspace is a particular social context, the appropriateness of applying these virtues to cyberspace rightfully remains in doubt.

Chang and Chou (2015) indicated Taiwanese social virtues may not be the same as others around the world. Therefore, the current preliminary study targets Taiwanese young adolescents and the goal is to explore important virtues that can improve experiences in cyberspace, where young adolescents can pursue personal values and social charity. In order to do so, the current study uses an instrument—the Cyber Virtues Scale (CVS)—for measuring underlying dimensions of young adolescents' virtuous behaviors in online settings. The

CVS may clarify young adolescents' virtues in cyberspace. The results of this study can be instructive to those who design character education programs.

Method

Item development

Because cyberspace virtues as a research field have not yet been the subject of extensive scholarship (Chang & Chou, 2015), we first probed both possible important virtues among cyberspace-based young adolescents and corresponding behaviors. We surveyed 758 parents and 750 teachers who are experts in the physical and psychological development of young adolescents. Parents and teachers have the educational responsibilities and expectations for young adolescents' correct behavior and virtues in cyberspace.

We distributed a paper-and-pencil survey questionnaire to teachers and parents of elementary and junior high school students asking "In your opinion, what are important virtues for young adolescents in cyberspace?" The total valid sample that involved nationwide stratified sampling was 1,508, split between 750 teachers and 758 parents. Survey respondents regarded law-abidance (86.2%), respect (77.0%), and self-regulation (74.2%) as three of the most important virtues. Other important virtues identified in this questionnaire were service (49.5%), sharing (47.6%), courtesy (43.0%), honesty (42.8%), responsibility (41.5%), lifelong learning (39.7%), care (37.2%), justice (35.3%), and cooperation (34.3%). These 12 virtues all earned more than one-third of the teachers' and parents' support and were chosen as important and needed by students in cyberspace. In order to generate the Cyber Virtual Scale (CVS) items based on these 12 virtues, we adapted the items of the Values in Action for Youth (VIA-Youth) which were created from Park and Peterson's corresponding instrument. The Internet ethics and virtues were created from Gray and Tejay (2014), and Willard (1997). Empathy and cyberbullying were created from Ang and Goh (2010) and self-regulation and online social behavior were created from Rouis et al. (2011). We created draft items of the CVS.

Furthermore, we organized an expert focus group comprising one university faculty member of education, two doctoral students who major in education, and one senior elementary school teacher. All members of the focus group were experts on Internet literacy or moral education. The experts held detailed discussions on the CVS draft items. Finally, we developed a preliminary set of 64 CVS items on the basis of the focus-group experts' discussions. Using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), we then constructed these items in the form of a self-report questionnaire for the student survey.

Research participants

The target participants were all Taiwanese elementary and junior high school students. A total of 635 paper-and-pencil questionnaires were distributed to stratified sampled 5th–9th graders according to Taiwan's geographic areas (i.e., north, central, south, and remote environments). A total of 607 valid sets of data were obtained (95.59%): 88 (14.50%) from the 5th graders, 226 (37.23%) from the 6th graders, 80 (13.18%) from the 7th graders, 141 (23.23%) from the 8th graders, and 72 (11.86%) from the 9th graders. Of all the students, 308 (50.74%) were male and 299 (49.26%) were female.

Results

In order to check the validity and reliability of the CVS's structure, we conducted an item analysis and an exploratory factor analysis (EFA). The data were analyzed using SPSS 19.0. Before conducting the EFA, we examined descriptive statistics of 64 items to ensure their appropriateness as measurement items. The descriptive statistical analyses showed that the mean scores of all items ranged from 2.73 to 4.20, on a 5-point Likert scale. The standard deviations ranged from 1.07 to 1.47. There were no items found with extreme means (close to either 1 or 5) in the CVS. For the factor analysis, we examined skewness and kurtosis, finding that the skew and kurtosis indices ranged from -1.23 to 0.28 and -1.33 to 0.83 respectively. Therefore, the data in this study were univariate normal (Kline, 2005). In this study, the critical ratio ranged from 6.57 to 18.31 for 53 items out of a total of the CVS's 64 items. Because the critical-ratio standards for the remaining 11 items were all below 4, those 11 items were eliminated as inappropriate items (Huck, 2012). As for the test of homogeneity, the results of the corrected item-total correlation were between 0.41 and 0.69.

In our study, the value of Kaiser-Meyer-Olkin (KMO) was 0.92, suggesting that the application of a factor analysis would be appropriate. Bartlett's Test of Sphericity yielded a Chi-Square value of approximately 4820.847 ($p < .000$), which means that the correlation matrix of data for a factor analysis would be appropriate. The CVS had a five-factor structure accounting for 57.249% of the total variance. Thus, 28 items with loadings less than 0.40 were deleted from the original 53 items, since Stevens (1992) recommended interpreting factor loadings with a value greater than 0.40. The final version of the CVS consisted of 25 items in 5 factors: interpersonal interaction (six items including etiquette, respect and responsibility), knowledge accumulation (four items including learning and cooperation), social justice (six items including service and justice), information sharing (five items including sharing and caring), and self-discipline (four items including self-control and honesty). We defined the factors according to the shared meaning of each collection of gathered items. We categorized these items by virtues. Throughout the process, a co-author of this study acted as an independent researcher, scrutinizing the identified categories to enhance the truthfulness and consistency of the factors' name. Table 1 shows the CVS's sub-scales (factors) and each item's factor loading.

Table 1. CVS dimensions and items

Item No.	Dimensions/ Items	Factor				
		1	2	3	4	5
Interpersonal interaction (Cronbach's alpha = 0.827)						
42	I try to practice good manners even when people cannot see me online.	.794				
40	I respect net friends' expression of diverse opinions.	.772				
38	When emailing others, I make sure that the given email's content is accurate before clicking "send."	.753				
33	I am careful about my behaviors on the Internet.	.730				
35	My attitudes toward normal Internet users are the same as my attitudes toward any community with different cultures in Internet.	.676				
50	Before sending an email, I think about whether it will bother others.	.664				
Social justice (Cronbach's alpha = 0.802)						
61	I make use of the Internet to help disadvantaged people.		.884			
56	I participate in online charity activities.		.753			
41	I make use of the Internet to contribute to society.		.745			
46	I make use of the Internet to improve our society.		.658			
49	I use the Internet to restrain my peers from scolding or bullying others.		.640			
64	I oppose online discrimination against disadvantaged people.		.538			
Information sharing (Cronbach's alpha = 0.787)						
3	I share my work with others online.			.853		
21	I share my ideas with others online.			.767		
32	I share my daily-life information with others online.			.712		
23	I use the Internet to lift the spirits of depressed people.			.612		
15	I share information about useful online resources with other people.			.468		
Knowledge accumulation (Cronbach's alpha = 0.799)						
11	I collect online learning resources or tools.				.887	
5	I make use of the Internet for learning.				.822	
17	I make use of the Internet for managing my knowledge.				.684	
24	I make use of the Internet for cooperating with peers for learning.				.535	
Self-discipline (Cronbach's alpha = 0.738)						
14	I note how much time I spend on the Internet to avoid unhealthy behavior.					.831
2	I strive not to let the Internet influence my sleep or daily life.					.830
26	I get my schoolwork done first and then surf on the Internet for fun.					.661
16	When teachers ask about my Internet use, I respond honestly.					.449
Percentage of variance		31.388	9.706	6.261	5.737	4.157

Note. Overall $\alpha=0.906$. Total variance explained is 57.249%.

The reliability coefficient, Cronbach's alpha, is an estimate of the internal consistency of a scale's items, measuring the extent to which item responses obtained at the same time correlate highly with each other. The 25-item instrument had a very high reliability of .906, which exceeds the minimum standard of 0.80 suggested for basic research (Carmines & Zeller, 1979). The reliability of each factor was as follows: interpersonal interaction, .827; knowledge accumulation, .799; social justice, .802; information sharing, .787; and self-discipline, .738.

To determine the relationships of the scale factors, correlation analysis was conducted, and the correlations between the scores of the factors were found to be significant and within the range of .227-.580. Table 2 shows that the lowest correlation was observed between the factors "Self-discipline" and "Information sharing" ($r = .227, p < .01$), and the highest correlation was observed to be between "Knowledge accumulation" and "Information sharing" ($r = .580, p < .01$)

Table 2. Correlation values between scale factors

Factors	Interpersonal interaction	Social justice	Information sharing	Knowledge accumulation	Self-discipline
Interpersonal interaction	1				
Social justice	.435**	1			
Information sharing	.378**	.554**	1		
Knowledge accumulation	.474**	.490**	.580**	1	
Self-discipline	.511**	.380**	.227**	.443**	1

Note. ** $p < .01$.

Discussion

For the current study, we have created a CVS to probe young adolescents' practice of virtues in cyber contexts. We conducted an exploratory factor analysis to identify possible exemplary-behavior items as distinct factors, to enumerate these factors, and to ensure CVS-construct validity (i.e., the deletion of invalid items). The results of a series of statistical analyses left 25 statements corresponding to a total of five factors. These five dimensions encompass the core virtues of cyberspace in Taiwanese students.

CVS is a pioneering questionnaire that explores the scope of young adolescents' virtues in cyberspace: young adolescents' self-reported data about cyberspace indicates that the higher a CVS score, the greater the number of self-reported virtuous behaviors. There are many similar self-reported surveys for measuring virtues (Cawley III et al., 2000; Peterson & Seligman, 2004; Steen et al., 2003). The CVS could objectively measure online behavior by self-reported surveys too.

This study defined five factors as core virtues for cyberspace. The finding is similar to findings in the studies of Willard (1997), Milson and Chu (2002), and Stephens et al. (2007). These studies identified similar civic virtues for netizenship.

Moreover, the studies identified several core virtues that were also important in both cyberspace and positive psychology. For example, the meaning of "love of learning," as listed by Peterson and Seligman (2004), share the same spirit as in the core concept of "knowledge accumulation" in the CVS. In our study, we propose that interpersonal interaction can promote mercy, and that courage and integrity can make it easier to pursue justice. Finally, the implied meaning of "self-regulation" (Peterson & Seligman, 2004) as well as the "self-discipline" in the current study.

Why should Taiwanese young adolescents have these five core virtues in cyberspace, and what is the significance of these five core virtues for cyberspace? First of all, young adolescents should have the virtues of interpersonal interaction when interacting with others on the Internet, such as etiquette, respect and responsibility. The virtues of interpersonal interaction refer to one's consideration for others. Internet users should understand that others will treat them with the same attitude, for example, with polite behavior or well-mannered practice.

This study found that knowledge accumulation is one of the core virtues in cyberspace. However, past research indicated that most students have treated the Internet more as a toy for entertainment or merely a tool for information seeking and searching (Chou, Yu, Chen, & Wu, 2009). Young adolescents often seem to ignore the learning advantages attributable to the Internet, which not only has the merits of reduced temporal and spatial

constraints, but also promotes exploration, collaboration, community, sharing, authenticity (Kearsley, 2000). The Internet may become a tool of thinking and knowledge management, and moreover become a place of creation and knowledge sharing.

Milberry (2006) considered that creating a public and democratic space is very important, whether in real society or in cyberspace. The Net generation might bravely challenge the inherent power inequities in cyberspace. As mentioned above, the Internet has the distinguishing feature of de-contextualization, which therefore might lessen the presence of users' gender, age, race, and social status. The relationships among users should theoretically be on a highly equal basis. Thus, people might more easily promote or practice social justice in cyberspace. Amichai-Hamburger and Furnham (2007), and Bao and Xiang (2006) pointed that justice and care may be more easily achievable in cyberspace. Young adolescents should realize that every Internet user can change cyberspace by caring about others, helping the disadvantaged and taking part in public affairs.

Information sharing is an act of making something available to others. Information and communication technology (ICT) can be used more easily to share knowledge, information and data once the temporal and spatial barriers between Internet users are lowered. Aigrain (2012) stated that the sharing of digital works without direct or indirect monetary transactions is valuable. Therefore, young adolescents should abide by the concept of information sharing when interacting with others in cyberspace. Online users will have rich information to share at little cost. If the digital generation widely accepts the virtue of information sharing, the Internet would become a place where people can contribute their own knowledge to a collective. However, Aigrain (2012) mentioned that information sharing in cyberspace must be recognized as a legitimate activity. Information sharing has often been beyond the reach of copyright law, so people should simultaneously practice self-restraint and empathy when sharing information. Otherwise, online practices might offend people and even violate intellectual-property law. Therefore, the users should appropriately understand the virtues of sharing to avoid adverse effects.

In cyberspace, the virtue of self-discipline is important as well. Indeed, rules and regulations govern Internet society. Although the anonymity of the Internet has allowed online users to express their opinions with greater freedom and with less concern about censorship, individuals on the Internet should ensure that their statements do not violate laws and regulations. Internet users should show self-restraint and refrain from not only harassing other people but also engaging in harmful behavioral patterns like Internet addiction, hacking, and rumor-mongering (Rouis, Limayem, & Salehi-Sangri, 2011). However, not all parents monitor or discipline their children for inappropriate behavior in cyberspace. In addition, addiction to the Internet affects user's health, academic performance and other inappropriate consequences (Chou, 2001). If the Internet user could show the virtues of self-discipline, they can avoid the harmfulness of the Internet.

Conclusion and recommendations for future research

In this study, we found that the CVS consists of five core virtues in cyberspace: interpersonal interaction, knowledge accumulation, social justice, information sharing and self-discipline. We recommend that educators should focus on these core virtues and guide young adolescents to practice them in cyberspace. The CVS is to measure adolescents' behaviors on Internet, and the behaviors are not limited to the use of a specific technology device. For example, the incidents of cyberbullying take place using a computer, laptop or other devices are inevitably about virtuous behaviors, involving interpersonal interaction or social justice. Thus, the CVS is applicable to measuring Internet behavior regardless of the technology equipment used.

This study has revealed several limitations that should be addressed in future research. First, this study focused only on the core values of Taiwanese society. These core values may not be applicable to other cultures. Second, all target participants in this study were elementary and junior high school students. In order to investigate more grade-level differences among students' virtues and related behaviors, future research may consider involving a wider swath of participants encompassing, for example, senior high school students and college students. Third, the CVS is a self-report scale. We should notice the possible influence posed by social desirability and need to do more studies exploring the incremental validity of the CVS. Finally, the present study has used an exploratory factor analysis. Future research may consider a confirmatory factor analysis (CFA), to confirm the existence of five dimensions in the CVS model.

In conclusion, the development of the CVS here should enable teachers and parents to reconsider young adolescents' conception and practice of Internet virtues and to provide better guidance in these areas. It is our hope that, if educators successfully help cultivate these virtues, (1) student-age children will change their

attitudes and behaviors in cyberspace so that cyberspace as a whole will evolve in a positive direction and (2) young adolescents will have a more positive and meaningful cyber life.

Acknowledgments

This research was supported by the Ministry of Science and Technology of Taiwan (Project No. MOST 102-2511-S-009-002-MY4). The authors would also like to thank the anonymous reviewers for their insightful feedback.

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