Computers in Human Behavior 27 (2011) 1959–1962

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

The associations between young adults' face-to-face prosocial behaviors and their online prosocial behaviors

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ARTICLE INFO

Article history:
Available online 26 May 2011

Keywords:
Online prosocial behavior
Face-to-face prosocial behavior
Electronic technology
Young adult
Emerging adult
Co-construction theory

ABSTRACT

Drawing on the co-construction theory (Subrahmanyam, Smahel, & Greenfield, 2006), this study investigated the relationship between online and face-to-face prosocial behaviors among 493 (345 women) young adults (ages 18–25 years). Findings indicated that face-to-face prosocial behaviors were positively associated with the engagement in online prosocial behaviors through social networking sites (e.g., Facebook, Myspace, Twitter), chat programs (e.g., Google Talk, AOL Instant Messenger, Yahoo Messenger), email, and text messages, after controlling for gender and time spent using each type of technology. These findings extend the application of the co-construction theory to online prosocial behaviors. Furthermore, these findings suggest that the internet is also a place for positive interactions and call for more research investigating online prosocial behaviors.

1. Introduction

The consistent findings between adolescents' engagement in cyber aggression and face-to-face aggression suggest that school bullies may generalize their aggressive behaviors to online interactions (Campbell, 2005; Kowalski & Limber, 2007; Ybarra, Mitchell, Wolak, & Finkelhor, 2006). The co-construction theory was originally proposed to explain the similarities between adolescents' nondigital identities and their identity online (Boneva, Quinn, Kraut, Kiesler, & Sklovski, 2006; Lenhart, Purcella, Smith, & Zickuhr, 2011).This theory has recently been applied to explain the associations between face-to-face and cyber aggression (Calvete, Orue, Estevez, Villardon, & Padilla, 2010; Gradinger, Strohmeier, & Spiel, 2009; Kowalski & Limber, 2007; Ybarra et al., 2006). With a growing body of support, the co-construction theory posits that adolescents are psychologically connected to their online worlds similarly to their offline worlds (Subrahmanyam & Greenfield, 2008; Subrahmanyam, Reich, Waechter, & Espinoza, 2008; Subrahmanyam, Smahel, & Greenfield, 2006). Although less research has been conducted among young adults, available studies have shown that they use electronic technologies at similar rates as adolescents (Lenhart et al., 2011; Ybarra & Mitchell, 2004; Ybarra et al., 2006). Recent studies (Mcmillan & Morrison, 2008; Subrahmanyam et al., 2008) indicate that young adults use electronic technologies to connect and reconnect with their offline friends providing an additional application of the co-construction theory to young adults' online and offline activities and communications. Much of the previous research has focused on negative interactions that may occur online, such as cyber aggression (Calvete et al., 2010; Gradinger et al., 2009; Kowalski & Limber, 2007; Ybarra et al., 2006), with little attention given to positive online interpersonal exchanges.

The internet has brought individuals conveniences for exchanging information as well as opportunities to communicate in positive ways (Wellman & Gulia, 1999). Recent research has also recognized the "prosocial promise" of the internet by investigating the advantages of online therapy, online volunteerism, and online support groups (Amichai-Hamburger, 2008; Eichhorn, 2008; Warmerdamn, van Straten, Jonsma, Twisk, & Cuijpers, 2009). To address the potential of positive interactions through electronic technology, researchers have started to examine prosocial interactions specifically through online games.

1.1. Online prosocial behaviors

The only published study to investigate online prosocial behaviors was conducted by Wang and Wang (2008) who examined the relationship between altruism and prosocial behaviors through online games. Altruism was assessed using the altruism facet scale (e.g., active concern for the welfare of others) from the NEO-Personality Inventory-Revised (Goldberg et al., 2006). Findings indicated that altruistic gamers were more likely to help others (e.g., helping with quests, provide answers to questions) through online games when compared to less altruistic gamers. Additionally,

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doi:10.1016/j.chb.2011.04.019

men and women were equally likely to help others in online games. However, men were more likely to help female gamers only, while women helped male and female gamers equally.

Drawing on the co-construction theory, (Wang & Wang, 2008) findings may suggest that prosocial individuals may generalize their helpful nature beyond their face-to-face interactions and into their digital worlds. Potentially, young adults may treat their prosocial behaviors in the digital world as an extension of their prosocial dispositions. This orientation could extend beyond the online gaming environment into other electronic mediums (e.g., social networking sites, text messages), which are important to consider because only 25% of young adults play online games (Lenhart et al., 2011). Furthermore, there are noticeable differences between online gaming and other electronic mediums. First, online gaming limits the recipients of prosocial behaviors to individuals the young adult may or may not know in a nondigital context. Investigating other electronic mediums may shed more light on prosocial behaviors to a broader range of recipients. Second, online gaming may require cooperative behaviors in order to achieve common goals inviting more opportunities to act prosocially when compared to other electronic venues. Therefore, the current study investigates multiple electronic mediums to broaden the online contexts in which young adults may engage in prosocial behaviors.

Furthermore, Wang and Wang found no gender differences in helping through online games which contrasts with findings regarding face-to-face prosocial behaviors. Specifically, women are typically more prosocial in their face-to-face interactions when compared to men (Caprara & Steca, 2005; Hardy & Kisling, 2006; Lenhart et al., 2011). It is unclear whether gender differences will be found in broader online settings. Therefore, in order to clearly examine the association between online and face-to-face prosocial behaviors, it may be necessary to control for gender in the analysis.

1.2. The present study

Guided by the co-construction theory that suggests young adults construct their online worlds like their nondigital worlds (Subrahmanyam & Greenfield, 2008; Subrahmanyam et al., 2008; Subrahmanyam et al., 2006), the present study examined the relationship between young adults' face-to-face and online prosocial behaviors. We hypothesized that young adults with a face-to-face prosocial orientation would generalize this orientation to their online interactions through social networking sites (e.g., Facebook, Myspace, Twitter), chat programs (e.g., AOL Instant Messenger, Yahoo Messenger, Google Talk, MSN Messenger), email, and text messages. Each of these technologies was examined because of their high frequency of usage among young adults (Lenhart et al., 2011). In our analyzes, we controlled for the time spent using each technology type as we expected young adults who spent more time using these technologies might have more opportunities to act prosocially through that particular technology. We also controlled for gender in the analyzes for possible gender effects in prosocial behaviors (Caprara & Steca, 2005; Hardy & Kisling, 2006; Padilla-Walker, Barry, Carroll, Madsen, & Nelson, 2008).

2. Method

2.1. Participants

Participants were 493 undergraduate students (345 women) enrolled in introduction to psychology courses with an average age of 20 years (SD = 2.90). Most of the participants were White (63%), followed by Hispanic (18%), Asian (8%), Black or African American (8%), and other (3%).

2.2. Measures and procedures

All participants received an internet address directing them to the survey. Before taking the surveys, all participants read an informed consent document letting them know that their participation was voluntary and they could stop participating at anytime without penalty. After giving their permission, participants filled out measures regarding their demographics (e.g., age, gender, ethnicity), time spent using electronic technology, online, and face-to-face prosocial behaviors.

2.2.1. Time spent using electronic technologies

Participants reported how many hours per day they used social networking sites (SNS) (e.g., Facebook, Myspace, Twitter), chat programs (e.g., AOL Instant Messenger, Yahoo Messenger, Google Talk, MSN Messenger), email, and text messages on a scale of 1 (*never)* to 5 (7 h *a day or more*). The usage of the three social networking sites was averaged as well as the usage of the four chat programs. Chronbach's alpha was .86 for SNS and .92 for chat programs.

2.2.2. Face-to-face prosocial behaviors

This measure examined participants' engagement in prosocial behaviors in their face-to-face interactions. The questionnaire used the four prosocial behaviors items from Prinstein and colleagues' (Prinstein & Cillessen, 2003) measure of aggressive and prosocial behaviors. The questions included "I helped someone out when they were having a problem", "I was nice and friendly to someone when they needed help", "I stuck-up for someone who was being picked on or excluded", and "I helped someone join a group or conversation". Participants rated the items on a scale of 1 to 5 (1 = *never*, 5 = *a few times a week*). We compared these items with other prosocial behaviors questionnaires used among young adults and found similarities among them (Linder, Crick, & Collins, 2002; Loudin, Loukas, & Robinson, 2003; Werner & Crick, 1999). The four prosocial behavior items were averaged to form a score indicating face-to-face prosocial behaviors. Cronbach's alpha for this measure was .88.

2.2.3. Online prosocial behaviors

This questionnaire included a description of four prosocial behaviors (e.g., "say nice things", "offer help", "cheer someone up", "let someone know I care about them"). We adapted two items (e.g., "I helped someone out when they were having a problem", "I was nice and friendly to someone when they needed help") from the face-to-face prosocial behaviors measure (Prinstein & Cillessen, 2003), but revised these items to make them more general. Two more items (e.g., "cheer someone up", "let someone know I care about them") were added specifically for this study. Different items were used for online prosocial behaviors than face-to-face prosocial behaviors because there are limited ways young adults can express prosocial behaviors through the online environment. Thus, we opted to use more general items to represent online prosocial behaviors. Participants rated how often they engaged in the four prosocial behaviors through each technology type (e.g., social networking sites, chat programs, email, text messages) on a scale of 1 to 9 (1 = *never*, 3 = *monthly*, 9 = *daily*). The four behaviors were averaged resulting in a prosocial behavior score for each technology type. Cronbach's alphas for online prosocial behaviors were .84 for social networking sites, .90 for chat programs, .85 for email, and .84 for text messages.

3. Results

To examine the associations between the engagement in online prosocial behaviors and face-to-face prosocial behaviors, we

Table 1
Correlations among usage of technology, and online and face-to-face prosocial behaviors.

	1	2	3	4	5	6	7	8	9
1. Usage of SNS	–								
2. Usage of chat programs	.28***	–							
3. Usage of email	.11*	.03	–						
4. Usage of text messages	.16***	.05	.37***	–					
5. Online PB – SNS	.64***	.19***	.10*	.10*	–				
6. Online PB – chat programs	.18***	.65***	.01	−.04	.44***	–			
7. Online PB – email	−.02	.11*	.15**	−.04	.22***	.27***	–		
8. Online PB – text messages	−.01	−.11*	.19***	.28***	.21***	.04	.27***	–	
9. Face-to-face PB	.08	−.02	.15**	.04	.15**	.03	.14**	.21***	–

Note. Table includes the usage of social networking sites (e.g., Facebook, Myspace, Twitter), chat programs (e.g., AOL Instant Messenger, Yahoo Messenger, MSN Messenger, Google Talk), email, and text message as technologies; SNS = Social networking sites; PB = Prosocial behaviors.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

conducted correlations and hierarchical regressions. The correlations were conducted among time spent using electronic technologies, prosocial behaviors through each of the four technology types (i.e., social networking sites, chat programs, email, text messages), and face-to-face prosocial behaviors (see Table 1). Face-to-face prosocial behaviors were positively correlated with online prosocial behaviors through social networking sites (SNS), $r(355) = .15$, $p < .001$, email, $r(359) = .14$, $p < .01$, and text messages, $r(360) = .21$, $p < .001$, but not for chat programs. The time spent using electronic technologies was positively correlated with online prosocial behaviors through that particular technology, including SNS, $r(408) = .64$, $p < .001$, chat programs, $r(380) = .65$, $p < .001$, email, $r(364) = .15$, $p < .01$, and text messages, $r(369) = .28$, $p < .001$.

Hierarchical multiple regressions were conducted to predict online prosocial behaviors displayed through each of the four electronic technologies. Face-to-face prosocial behaviors served as the predictor, while controlling for gender and time spent using electronic technologies. Specifically, Block 1 included gender and time spent using electronic technologies, while Block 2 included face-to-face prosocial behaviors. An interaction between face-to-face prosocial behaviors and gender was examined, but was not significant for any of the regressions and, thus, was not included in the final report.

The results showed that, after controlling for gender and technology usage, face-to-face prosocial behaviors significantly predicted online prosocial behaviors displayed through SNS ($\Delta R^2 = .11$, $p < .001$; $\beta = .34$, $p < .001$), chat programs ($\Delta R^2 = .18$, $p < .001$; $\beta = .28$, $p < .001$), email ($\Delta R^2 = .04$, $p < .001$; $\beta = .20$, $p < .001$), and text messages ($\Delta R^2 = .03$, $p < .001$; $\beta = .18$, $p < .001$) (see Table 2). Time spent using electronic technologies was also positively related to online prosocial behaviors through SNS ($\beta = .56$, $p < .001$), chat programs ($\beta = .17$, $p < .01$), email ($\beta = .12$, $p < .05$), and text messages ($\beta = .26$, $p < .001$). Gender was not a significant predictor of online prosocial behaviors through any technology.

4. Discussion

The results of this study indicate that face-to-face prosocial behaviors were positively associated with online prosocial behaviors displayed through social networking sites (SNS), chat programs, email, and text messages. These findings are consistent with those from Wang and Wang (Wang & Wang, 2008) regarding altruistic individuals' tendency to help other players through online games. Furthermore, this study indicates that young adults act prosocially online through a variety of technologies suggesting that young adults socialize in the online world similarly as they do in their face-to-face interactions supporting the co-construction theory (Subrahmanyam & Greenfield, 2008; Subrahmanyam et al., 2008; Subrahmanyam et al., 2006).

The inclusion of time spent using electronic technologies in this study shows that the longer young adults use a specific technology, the more often they displayed prosocial behaviors through that technology. This finding is consistent with previous findings regarding the positive relationship between the engagement in cyber aggression and time spent using the internet (Sourander et al., 2010; Twyman, Saylor, Taylor, & Corneaux, 2010; Ybarra & Mitchell, 2004). Moreover, this study extended the literature that primarily focuses on cyber aggressive behaviors by examining how time spent online was related to the engagement of positive online interactions.

Findings from previous studies (Caprara & Steca, 2005; Hardy & Kisling, 2006; Padilla-Walker et al., 2008) conducted on the face-to-face prosocial behaviors of young adults suggest that women report

Table 2
Hierarchical regressions for predicting online prosocial behaviors using gender, technology usage, and face-to-face prosocial behaviors.

	Prosocial behaviors in SNS			Prosocial behaviors in chat programs			Prosocial behaviors in email			Prosocial behaviors in text messages		
	β	ΔR^2	R^2	β	ΔR^2	R^2	β	ΔR^2	R^2	B	ΔR^2	R^2
Block 1		.04***	.63		.03**	.17		.04***	.19		.10***	.32
Gender	.07			−.03			.09			.01		
Usage	.62***			.17***			.13**			.27***		
Block 2		.11***	.72		.18***	.46		.04***	.27		.03***	.36
Gender	.08			−.07			.06			.01		
Usage	.56***			.17**			.12*			.26***		
Face-to-face prosocial behaviors	.34***			.28***			.20***			.18***		

Note. The table includes the usage of social networking sites (e.g., Facebook, Myspace, Twitter), chat programs (e.g., AOL Instant Messenger, Yahoo Messenger, MSN Messenger, Google Talk), email, and text message as technologies; The usage predictor refers to the usage of the technology indicated in the respective dependent variable; SNS = Social networking sites.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

higher levels of prosocial tendencies than do men. We controlled for the possible effects gender may have on online prosocial behaviors and found no significant relationship for any of the technologies. However, our findings are consistent with the findings of Wang and Wang (Wang & Wang, 2008) that showed no gender differences in prosocial behaviors displayed through online games. The lack of gender differences in online prosocial behaviors may be expected because men and women are equally likely to use these technologies (e.g., social networking sites, email, chat programs, text messages) to keep in touch with the people important to them (e.g., family, online/offline friends) and use these technologies to show their care for and give help to others (Lenhart et al., 2011).

Results of the current study provide evidence to support the application of the co-construction theory to the engagement in prosocial behaviors (Subrahmanyam & Greenfield, 2008; Subrahmanyam et al., 2008; Subrahmanyam et al., 2006). Specifically, the emergence of the association between face-to-face and online prosocial behaviors suggests that young adults extend their behavioral dispositions in the physical world into their digital worlds.

4.1. Limitations and future directions

Although we carefully looked into various electronic technologies that young adults used to communicate with others, we did not examine the recipients of prosocial behaviors. Young adults may display different amounts of prosocial behaviors to different recipients (e.g., family/friends vs. acquaintance/strangers) in each of the technologies we examined. Therefore, examining the possible moderation effects of recipients of online prosocial behaviors is warranted. Furthermore, the co-construction theory should be investigated regarding whether the presentation of one's identity through different technologies and face-to-face makes a difference in one's usage of online prosocial behaviors. This is an important consideration because different technologies may (e.g., gaming consoles, multiplayer online games, social networking sites) provide users with different interpersonal experiences and ways to express their identities which could possibly affect their online behaviors.

4.2. Conclusions

Findings of the present study suggests that young adults are capable of being prosocial through a variety of electronic technologies and that they may co-construct their online and offline worlds (Subrahmanyam & Greenfield, 2008; Subrahmanyam et al., 2008; Subrahmanyam et al., 2006). Furthermore, this study also implies that the internet should not be viewed as a place of only negative interactions, but also a place that one can enjoy and to connect positively with others. The present study highlights the importance of understanding more about young adults' online social interactions.

References

Amichai-Hamburger, Y. (2008). The contact hypothesis reconsidered: Interacting via internet: Theoretical and practical aspect. In A. Barak (Ed.), *Psychological aspects of cyberspace. Theory, research, applications* (pp. 209–227). Cambridge, UK: Cambridge University Press.

Boneva, B., Quinn, A., Kraut, R., Kiesler, S., & Sklovski, I. (2006). Teenage communication in the instant messaging era. In R. Brynin & S. Kiesler (Eds.), *Information technology at home* (pp. 612–672). Oxford University Press.

Calvete, E., Orue, I., Estevez, A., Villardon, L., & Padilla, P. (2010). Cyberbullying in adolescents: Modalities and aggressors' profiles. *Computers in Human Behavior, 26*, 1128–1135.

Campbell, M. (2005). Cyber bullying: An old problem in a new guise? *Australian Journal of Guidance and Counseling, 15*, 68–76.

Caprara, G., & Steca, P. (2005). Self-efficacy beliefs as determinants of prosocial behavior conducive to life satisfaction across ages. *Journal of Social and Clinical Psychology, 24*, 191–217.

Eichhorn, K. (2008). Soliciting and providing social support over the internet: An investigation of online eating disorder support groups. *Journal of Computer-Mediated Communication, 14*, 67–78.

Goldberg, L., Johnson, J., Eber, H., Hogan, R., Ashton, M., Cloninger, C., et al. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*, 84–96.

Gradinger, P., Strohmeier, D., & Spiel, C. (2009). Traditional bullying and cyberbullying: Identification of risk groups for adjustment problems. *Journal of Psychology, 217*, 205–213.

Hardy, S., & Kisling, J. (2006). Identity status and prosocial behaviors in young adulthood: A brief report. *Identity: An International Journal of Theory and Research, 6*, 363–369.

Kowalski, R., & Limber, S. (2007). Electronic bullying among middle school students. *Journal of Adolescent Health, 41*, S22–S30.

Lenhart, A., Purcella, K., Smith, A., Zickuhr, K., 2011. Social media and young adults. <http://www.pewinternet.org/Reports/2010/Social-Media-and-Young-Adults.aspx> Retrieved 26.02.11.

Linder, J., Crick, N., & Collins, W. (2002). Relational and victimization in young adults' romantic relationships: Associations with perceptions of parent, peer, and romantic relationship quality. *Social Development, 11*, 69–86.

Loudin, J., Loukas, A., & Robinson, S. (2003). Relational aggression in college students: Examining the roles of social anxiety and empathy. *Aggressive Behavior, 29*, 430–439.

Mcmillan, S., & Morrison, M. (2008). Coming of age with the internet: A qualitative exploration of how the internet has become an integral part of young people's lives. *New Media Society, 8*, 73–95.

Padilla-Walker, L., Barry, C., Carroll, J., Madsen, S., & Nelson, L. (2008). Looking on the bright side: The role of identity status and gender on positive orientations during emerging adulthood. *Journal of Adolescence, 31*, 451–467.

Prinstein, M., & Cillessen, A. (2003). Forms and functions of adolescent peer aggression associated with high levels of peer status. *Merrill-Palmer Quarterly, 49*, 310–342.

Sourander, A., Klomek, A., Ikonen, M., Lindroos, J., Luntamo, T., Koskelainen, M., et al. (2010). Psychosocial risk factors associated with cyberbullying among adolescents: A population-based study. *Archives of General Psychiatry, 67*, 720–728.

Subrahmanyam, K., & Greenfield, P. (2008). Communicating online: Adolescent relationships and the media. *The Future of Children: Children and Media Technology, 18*, 119–146.

Subrahmanyam, K., Reich, S., Waechter, N., & Espinoza, G. (2008). Online and offline social networks: Use of social networking by emerging adults. *Journal of Applied Developmental Psychology, 29*, 420–433.

Subrahmanyam, K., Smahel, D., & Greenfield, P. (2006). Connecting developmental processes to the Internet: Identity presentation and sexual exploration in online teen chatrooms. *Developmental Psychology, 42*, 395–406.

Twyman, K., Saylor, C., Taylor, L., & Corneaux, C. (2010). Comparing children and adolescents engaged in cyberbullying to matched peers. *Cyberpscyhology, Behavior, and Social Networking, 13*, 195–199.

Wang, C., & Wang, C. (2008). Helping others in online games: Prosocial behavior in Cyberspace. *CyberPsychology, Behavior, & Social Networking, 11*, 344–346.

Warmerdamn, L., van Straten, A., Jonsma, J., Twisk, J., & Cuijpers, P. (2009). Online cognitive behavioral therapy and problem-solving therapy for depressive symptoms: Exploring mechanisms of change. *Journal of Behavior Therapy and Experimental Psychiatry, 40*, 169–178.

Wellman, B., & Gulia, M. (1999). Net surfers do not ride alone: Virtual communications as communities. In B. Wellman (Ed.), *Networks in the global village* (pp. 1–26). Boulders: Westview Press.

Werner, N., & Crick, N. (1999). Relational aggression and social-psychological adjustment in a college sample. *Journal of Abnormal Psychology, 108*, 615–623.

Ybarra, M., & Mitchell, K. (2004). Online aggressor/targets, aggressors, and targets: A comparison of associated youth characteristics. *Journal of Child Psychology and Psychiatry, 45*, 1308–1316.

Ybarra, M., Mitchell, K., Wolak, J., & Finkelhor, D. (2006). Examining characteristics and associated distress related to Internet harassment: Findings from the second youth Internet safety survey. *Pediatrics, 118*, 1169–1177.