Anonymously Hurting Others Online: The Effect of Anonymity on Cyberbullying Frequency

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Cyberbullying (CB) has recently become a significant issue in today’s society. Given the myriad negative consequences to the cyber-victim, it is important to determine what variables predict CB frequency. Based on broader psychological and communication theory, I predict that anonymity will (a) directly predict CB frequency, (b) moderate the relation between positive attitudes toward CB and CB frequency, and (c) mediate the relation between instant messaging frequency and CB behavior. Participants (N = 181) completed measures designed to assess these aforementioned variables. Results showed that positive attitudes toward CB, CB reinforcement, and anonymity strongly predicted CB frequency. Furthermore, moderation tests confirmed that CB was highest when positive attitudes and anonymity were both high. Finally, mediation tests revealed anonymity mediated the relation between instant messaging frequency and CB behavior. These results are important at elucidating what variables predict CB to hopefully inform intervention efforts aimed at reducing CB.

Keywords: cyberbullying, anonymity, attitudes

Violent and aggressive behaviors are not new behavioral phenomena. However, the method by which aggressive acts are delivered has changed with increased technology. For example, Anderson and Huesmann (2003) stated that violent behaviors rose dramatically with the accessibility of handguns. In today’s technology-based culture, individuals are now turning to electronic means (e.g., Internet, texting) to harm others, termed cyberbullying (CB) (defined as, “... the use of information and communication technologies such as e-mail, cell phone and pager text messages, instant messaging, defamatory personal Web sites, and defamatory online personal polling Web sites to support deliberate, repeated, and hostile behavior by an individual or group, that is intended to harm others” [cited in Li, 2007, p. 1779]). CB is a serious societal issue owing to the extensive harm it can cause the victim. Indeed, research has shown that those who are cyber-victimized are at risk for heightened negative psychological (fearful [Beran & Li, 2005], depressed [Patchin & Hinduja, 2006], suicide ideation [Hinduja & Patchin, 2010], and anger [Beran & Li, 2005]) and behavioral (drug abuse [Hinduja & Patchin, 2008] and poor school grades [Beran & Li, 2007]) outcomes.

To date, the majority of the CB literature has focused on the victim. Although important, a better understanding of the predictors of CB is needed to not only understand why people harm others using electronic methods, but also to inform interventions aimed at reducing CB. Relative to the literature focusing on the cyber-victim, there is a paucity of research testing what factors enhance or reduce the likelihood of CB. Consistent with broader aggression theory, research has shown positive correlations between CB frequency and traditional bullying frequency (Smith et al., 2008), normative aggressive beliefs (Ang, Tan, & Mansor, 2011), and low empathy (Ang & Goh, 2010; Steffgen, Konig, Pfetsch, & Melzer, 2011). However, many additional factors can influence CB, such as one’s attitudes toward CB, reinforcement, and identification. The objective of the current study is to elucidate on these aforementioned factors. In doing so, the results of this study may
be important in indentifying the predictors of CB to guide intervention efforts at reducing this harmful “newer” form of aggression.

The Role of Anonymity

In the online world, an aggressor will not be face-to-face with their victim. This would imply that anonymity should increase CB behavior; however, research has shown that traditional bullying is more common than CB (Olweus, 2012), and traditional bullies can harm others using covert aggressive tactics (e.g., gossiping, rumor spreading). Therefore, it is possible that anonymity can increase both traditional bullying and CB. Indeed, literature from broader social psychological and communication theories have shown that anonymity is related to aggressive behavior (Diener, 1976; see also Anderson & Bushman, 1997) owing to deindividuation processes. However, the focus of the current study was to understand what variables may predict CB behavior, and there is a paucity of research empirically testing anonymity’s contribution.

In the mediated world, anonymity is pronounced because a) the aggressor is not as identifiable and can use fake usernames, b) the bully does not need to have a previous relationship with the victim, and c) no physical scars or marks are inflicted on the victim from the bully. In other words, the aggressor’s anonymity may enhance the frequency of which CB (vs. traditional bullying) occurs. It should be noted that anonymity is not a necessary condition for CB. It is likely the case that the cyber-victim also knows the cyberbully; however, that is not always the case. Furthermore, a cyberbully may not truly be anonymous. Phone numbers can be traced and IP addresses can be identified, leading to low anonymity. However, feeling anonymous and being anonymous are not identical and even if the cyber-victim can identify their aggressor, the bully may still feel anonymous, which may predict CB frequency.

Surveys using adolescent samples have indicated that 29% of adolescent cyber-victims could not identify their aggressor (Patchin & Hinduja, 2006). Furthermore, in 2011, the Center for Disease Control (CDC, 2011) conducted a survey of adolescents who reported being cyberbullied. Their report indicated that of those cyberbullied, 67% of the CB occurred on instant messenger (IM), whereas only 17% occurred via text messaging and 21% using e-mail (percentages were not mutually exclusive). IM may enhance anonymity to the aggressor through the use of handles (made up electronic names) rather than one’s actual name, compared with texting or e-mailing where one’s name (and phone number/e-mail address) are easily accessible, decreasing the likelihood of anonymity. Although, it is hypothesized that IM frequency will better predict CB than texting or e-mail frequency, a cyberbully can create a fake e-mail address to attack others online. However, using IM as a means to aggress may still feel anonymous relative to e-mail frequency. No research has explicitly tested this claim and will be tested in the current study.

Theoretical Predictors of CB

To date, several researchers have suggested that one defining characteristic that differentiates CB from traditional bullying is enhanced anonymity for the aggressor (Li, 2007; Smith et al., 2008; Vandebosch & Van Cleemput, 2008). Indeed, Herring (2001) stated that the perceived anonymity afforded in the mediated world increases the likelihood of aggressive and hostile acts, as evident by the research showing that the majority of cyber-victims do not know their aggressor (Kowalski & Limber, 2007). Despite this wealth of research and speculation regarding anonymity’s influence on CB, there is a paucity of research empirically testing these relations and few theoretical postulations to make informed predictions to suggest how anonymity is related to CB.

Recently, Barlett and Gentile (2012) tested a theoretical model that focused on the distal learning processes involved in CB. Drawing on broader social–cognitive learning theories of aggression (e.g., General Aggression Model; Anderson & Bushman, 2002), their model posits that each successful positively reinforced instance of CB is a learning trial. Continued learning is related to the development of learned knowledge structures that predict CB. In other words, Barlett and Gentile (2012) posited that when one continues to cyberbully another, the aggressor will ascertain certain knowledge regarding the outcomes. Barlett and Gentile (2012) postulated and found evidence to suggest that continued and successful learned CB is
related to the development of two specific learned associations: anonymity and the lack of power differential. The former construct (anonymity) is the focus of the current research. According to Barlett and Gentile (2012), cyberbullies believe that they are perceived as anonymous in the mediated world after they successfully harm another several times. Also, in their model, Barlett and Gentile (2012) found that perceived anonymity directly predicts both CB frequency and positive attitudes toward CB. Mediation tests of their model showed that anonymity is related to CB frequency because of positive attitudes toward CB (the mediator). In other words, perceived anonymity predicts the development of positive attitudes toward CB, which in turn predicts CB frequency (see Figure 1).

As seen in Figure 1, anonymity can serve as both a mediator and moderator when predicting CB. Notably, when learning is the primary independent variable, anonymity can serve as a mediator in the path to CB frequency. However, anonymity can also serve as a moderator variable in the relation between positive attitudes toward CB and CB frequency. Thus, depending on what part of the model one is addressing, anonymity serves different roles. The current study will test both the mediating role of anonymity in the relation between media usage and CB frequency, as well as the moderating role of anonymity in the relation between positive attitudes toward CB and CB frequency. The investigation of how anonymity is related to CB frequency is of theoretical importance. Barlett and Gentile (2012) showed that anonymity is an important predictor in CB frequency without testing whether anonymity mediates or moderates the relations predicted in the Barlett and Gentile (2012) model. This is the purpose of the current study.

### Overview of the Current Study

The purposes of the study was to further test and validate the Barlett and Gentile (2012) model focusing on how anonymity is related to CB frequency. It is hypothesized that instant messaging (rather than e-mail) would be related to CB and anonymity would mediate this relationship. Furthermore, anonymity should moderate the relation between positive attitudes toward CB and CB frequency.

### Method

#### Participants

Data were collected in the Fall of 2010. One hundred and eighty-one (57% female) undergraduate students from a large Midwestern University participated in the study for partial course credit in their psychology classes. The average age of the sample was 19.47 ($SD = 1.56$) years. The majority (79%) were Caucasian. The majority of participants were in their first or second year of undergraduate education (80%).

#### Materials and Procedure

On completion of the informed consent, participants completed the following questionnaires and then were thanked and fully debriefed.

**CB frequency.** The past research in the CB literature has used dozens of different questionnaires to assess CB frequency. According to

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**Figure 1.** Extensions of the Barlett and Gentile (2012) model.
Rivers and Noret (2010), such diversity in measures is one (of several) reason why CB frequency percentages vary from study to study. The diverse numbers of measures each differ in important respects. For instance, some researchers use a Likert-like rating scale (e.g., Ybarra, Diener-West, & Leaf, 2007), whereas others use dichotomous estimates of CB (e.g., Li, 2007). Furthermore, some researchers define CB to the participant (e.g., Li, 2007), whereas others do not (e.g., Ang & Goh, 2010). Overall, there is no current “gold standard” measure of CB frequency. The CB frequency questionnaire used in the current study (see below for details) was used because it measured CB behavior adequately; it was based on a valid measure of media exposure of TV, movie, and video game violence (Gentile, Lynch, Linder, & Walsh, 2004). The CB scale used in the current study had participants indicate their level of CB without being explicit regarding what was being measured, akin to other measures that did not use definitions (although participants could probably infer what was being measured).

For the purposes of the current research, CB frequency was calculated using an adapted version of the Media Habits Questionnaire (Gentile et al., 2004). Participants were instructed to list their three favorite Web sites. For each Web site they listed, they rated it on how often they visited the Web site, how often they write mean messages to others on this Web site, and how often they posted mean comments about others on the Web site on a 1 (rarely) to 5 (all the time) rating scale. 1 If participants only listed two, rather than three, favorite Web sites, for example, then the items designed for the third Web site were assigned a value of zero (see Anderson & Dill, 2000). The frequency rating was multiplied by the write mean messages rating and then averaged across all three Web sites to get a CB via writing mean messages estimate. The same formula was applied to the posting mean comments ratings. These two estimates (posting mean messages and writing mean messages) were averaged to produce an estimate of CB via the Internet (α = .87). Higher scores indicate more CB. Akin to other measures of CB, the data for this were positively skewed; however, given the sample size, no corrections (e.g., log transforming) were done.

**Traditional bullying.** The Ybarra et al. (2007) traditional bullying scale was used to assess frequency of traditional, or face-to-face, bullying. This is a three-item questionnaire that asks participants how often they aggressed against others using a 1 (never) to 6 (everyday/ almost everyday) rating scale (α = .75). A sample item includes, “Made rude comments or mean comments to anyone.” The three items were summed such that higher scores indicated higher reported frequency of face-to-face bullying.

**Positive Attitudes Toward CB.** The researcher-created Positive Attitudes toward Cyberbullying questionnaire (Barlett & Gentile, 2012) was used (α = .95). This is a 20-item questionnaire that asks participants their level of agreement with the items on a 1 (strongly disagree) to 5 (strongly agree) rating scale. A sample item includes, “It is OK to bully others online if they deserve it.” These items were summed, such that higher scores indicate more positive attitudes toward CB.

**Anonymity.** The researcher-created Anonymity questionnaire (Barlett & Gentile, 2012) was used (α = .71). This is a five-item questionnaire that asks participants their level of agreement with the items on a 1 (strongly disagree) to 5 (strongly agree) rating scale. A sample item includes, “I feel comfortable sending mean text messages or e-mails to anybody no matter if I know them or not.” These items were summed, such that higher scores indicate more positive attitudes toward CB.

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1 The original version of this questionnaire asks participants to list their three favorite movies, TV shows, and video games. Thus, the adapted version used here only asked participants to list their three favorite Web sites. The term “Web site” was not defined for participants; however, that is a trivial absence. The primary focus for using this questionnaire was to ascertain how frequently participants visited the Web site and how often they cyberbullied using this Web site. This measure afforded the researchers a wide variety of options. For instance, a score of 0 could indicate that a) the Web site participant’s visited does not allow for CB (e.g., www.iastate.edu), or b) the Web site participant’s visited does afford possible CB opportunities (e.g., www .Facebook.com; the most favored Web site in this sample), but no such behavior is reported. Conversely, if the favored Web site does afford CB opportunities, then it is likely through these two options (posting mean comments or writing mean messages to others). Other methods of CB can exist on several Web sites that are not measured here (e.g., social exclusion, posting videos, etc.); however, based on the definition of CB used in this study and knowledge that social networking Web sites would most likely be favored over other Web sites, this was a valid measure of CB.
scores indicate more positive attitudes toward anonymity in CB.

**Demographic questionnaire.** A demographic questionnaire was used to assess sex, ethnicity, year in school, age, and other relevant demographic information.

**Media frequency.** To estimate weekly averages of instant messaging and e-mailing, an adapted version of the Media Habits Questionnaire (Gentile et al., 2004) was used.\(^2\) To compute weekly e-mail frequency, participants indicated how many hours they e-mailed others (and checked e-mail) on an average weekday and weekend day during the following times: 6 a.m. to noon, noon to 6 p.m., 6 p.m. to midnight, and midnight to 6 a.m. The weekday times were added and multiplied by five. This estimate was added to the product of the weekend days multiplied by two. This formula was applied to instant messaging time. Thus, the range of possible scores was from 0 to 168 with higher scores indicating more frequency. Although results showed that these data were positively skewed, no data transformations were conducted, because with a high sample size, the population distribution of scores approximates a normal distribution.

**Results**

**Zero-Order Correlations**

Table 1 displays the zero-order correlations between relevant variables. As expected, CB frequency was positively correlated with positive attitudes toward CB \((r = .60, p < .001)\), perceived anonymity \((r = .52, p < .001)\), and instant messaging frequency \((r = .40, p < .001)\). CB was uncorrelated with e-mail frequency. This latter finding suggests that instant messaging is likely to be the method by which CB is manifested, rather than e-mail. Indeed, instant messaging frequency was also positively correlated with anonymity \((r = .20, p < .001)\) and positive attitudes toward CB \((r = .23, p < .001)\). E-mail frequency was uncorrelated with these aforementioned variables \((rs < .11, ns)\).

**Difference in Correlation Test**

Prior to testing the moderating and mediating influence of anonymity in the relation between CB, it was of theoretical importance to show evidence that perceived anonymity was more strongly associated with CB than traditional bullying. A difference in correlation test for dependent samples was conducted (Cohen & Cohen, 1983). Results show a significant difference, \(t(177) = 2.99, p < .05\), in the magnitude of the relation between CB and anonymity \((r = .52)\) and traditional bullying and anonymity \((r = .30)\), while controlling for the colinearity of traditional bullying and CB \((r = .31)\). This suggests that although the relation between traditional bullying and anonymity was significant, this relation was stronger when CB was the predictor.

**Moderation Test**

Next, moderation tests were conducted to test the hypotheses of the current study. The Hayes and Matthes (2009) moderation MACRO for SPSS was used. This analysis tests the relationship between the independent variable (positive attitudes toward CB) and the dependent variable (CB frequency) at high (+1 SD) and low (−1 SD) level of the moderator (anonymity).

Results showed significant moderation, \(b = .01, se = .002, t(171) = 3.883, p < .001\). The relation between positive attitudes toward CB and CB was significant when anonymity was high, \(b = .09, se = .01, t(171) = 6.14, p <

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\(^2\) This measure was adapted by asking participants how many hours they were on IM and e-mail. The original version asked identical questions, but about video game use not IM or e-mail.
.001, but not when anonymity was low \( b = .03, \) 
\( \text{se} = .02, t(171) = 1.66, p > .05 \) (see Figure 2).

**Path Model**

To test the mediating mechanisms within the Barlett and Gentile (2012) model, path analysis using MPLUS was used. The raw data were used for analysis (rather than inputting the correlation or covariance matrix). Instant messaging and e-mail frequency were correlated independent variables predicting anonymity, positive attitudes toward CB, and CB frequency. Anonymity and positive attitudes toward CB also predicted CB frequency. Finally, anonymity predicted positive attitudes toward CB (see Figure 3). Because all possible paths and correlations were estimated, the estimated variance–covariance matrix was identical to the actual variance–covariance matrix, making the model a perfect fit of the data (i.e., no degrees of freedom to estimate model fit indices; \( \chi^2 = 0.00, \) Comparative Fit Index (CFI) = 1.00, Tucker-Lewis Index (TLI) = 1.00, Root Mean Square Error of Approximation (RMSEA) = 0.00, Standardized Root Mean Square Residual (SRMR) = 0.00, which is better than the baseline model in which all variables are uncorrelated, \( \chi^2 = 241.385 \) (df = 9), \( p < .00001 \).

Examination of the path coefficients showed that instant messaging frequency (\( \beta = .34, p < .001 \)), positive attitudes toward CB (\( \beta = .41, p < .001 \)), and anonymity (\( \beta = .16, p < .001 \)) positively predicted CB frequency. E-mail frequency was negatively related to CB frequency (\( \beta = -.13, p < .05 \)). Both e-mailing and instant messaging frequency predicted anonymity (\( \beta = -.18, p < .04; \beta = .29, p < .001, \) respectively); however, only instant messaging frequency (not e-mail frequency) predicted positive attitudes toward CB (\( \beta = .14, p < .04 \)). Finally, anonymity predicted positive attitudes toward CB (\( \beta = .66, p < .001 \)). The correlation between e-mail and IM frequency was significant, \( r = .53, p < .001 \). Indirect tests confirmed that the path from instant messaging frequency to anonymity to positive attitudes toward CB to CB frequency was significant (Indirect \( b = .08, t = 2.96, p < .01 \)). The same indirect test involving e-mail frequency showed the opposite pattern (Indirect \( b = -.05, t = -1.97, p < .05 \)).

**E-Mail Versus Instant Messaging Frequency**

The previous results show strong support for the importance of how different media outlets (i.e., IM and e-mail) influence anonymity, which, in turn, predicts CB frequency. However, some may suggest that these results are driven by the fact that some individuals may simply use IM more frequently than e-mail. If true, such an explanation may provide an alternative explanation to the previous findings. To test this, a repeated measures ANOVA was run to compare the frequency for IM to e-mail. Results showed that people spent significantly, \( F(1, 183) = 28.70, p < .001, \) partial \( \eta^2 = .14 \), more time on e-mail \( (M = 15.57, SD = 16.79) \) than IM \( (M = 8.62, SD = 19.20) \). This provides further support for the findings in the path model.

**Conclusion**

Overall, results support the hypotheses of the current study and show strong support that anonymity is an important predictor of CB behavior. Consistent with the learning postulations of the Barlett and Gentile (2012) model, anonymity was both a mediator in the relation between instant messaging frequency and CB, but also a moderator in the relation between positive attitudes toward CB and CB frequency. This suggests that when individuals learn that CB is anonymous and the negative consequences are rare (given said anonymity), CB is likely to occur.

**General Discussion**

CB is an emerging societal problem. As suggested by Barlett and Gentile (2012), the literature in this domain has been mostly descriptive and atheoretical. The purpose of the current research was to further our understanding of what variables predict CB behaviors in an attempt to (a) further advance theory by testing

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3 Postexamination of the path coefficients showed one nonsignificant path (positive attitudes toward CB regressed onto e-mail frequency; see Figure 3). This path was set to 0 to estimate model fit indices. Results showed that this model was a good fit for the data (\( \chi^2 = 1.38 \) (df = 1), \( p = .24, \) CFI = 1.00, TLI = 0.99, RMSEA = 0.05, SRMR = 0.01).
how anonymity is important to CB, (b) elucidate on the predictors related to CB behaviors, and (c) use these findings to help inform future interventions aimed at reducing CB.

**CB and Theory**

Results from the current study support the postulations of the Barlett and Gentile (2012)
model. This model posits that with continued CB experiences, individuals are likely to learn that they are more likely to be anonymous. Accompanied with the lack of power differential, such anonymity leads to the development of positive attitudes toward CB, which predicts subsequent CB behavior. Support for the role of anonymity in CB was found in myriad ways. First, results showed that anonymity was correlated with both positive attitudes toward CB and CB frequency. Second, results showed that anonymity moderated the relation between positive attitudes toward CB and CB behavior. This suggests that CB is more likely when positive attitudes are high and anonymity is high. Third, anonymity significantly mediated the relation between instant messaging frequency and CB. This suggests that the reason why instant messaging frequency was positively related to CB was because individuals feel anonymous. Finally, e-mail frequency was negatively related to anonymity and positive attitudes toward CB whereas instant messaging frequency was positively related to such attitudes and behaviors. If theory is correct, this finding can be explained by the hypothesis that e-mail may be more identifiable than instant messaging.

Although these results regarding the importance of anonymity are important to understanding the variables that predict CB behavior, the questionnaire used in the current research measures anonymity attitudes. It has been argued that perceived anonymity may be more important than actual anonymity; however, that is speculative and future research should test this empirically. In the real-world, a cyberbully’s anonymity is not assured especially when behaviors escalate to very aggressive or violent behaviors. The current study provided empirical data to suggest that perceived anonymity is an important contributing factor to predict CB, and, clearly, future work is needed to test under what conditions perceived versus real anonymity differentially affects such social behaviors.

Limitations and Future Research

Like all psychological research, limitations do exist that need be studied in future research. First, these data are limited by their correlational nature, and causal claims regarding the relations in this study cannot be made. Future research should use either an experimental or longitudinal research design to test these hypotheses. However, recent work by Barlett and Gentile (2012) used a longitudinal design to test similar hypotheses regarding the causal mechanisms of CB, and results were consistent to what was reported in this study. However, these studies have their limitations too. For example, Barlett and Gentile (2012) only used a two-month lag between scale administrations in their longitudinal study. Future research is desperately needed in this domain.

Second, the current study used a college-aged sample. It could be argued that the frequency of CB peaks during junior high and high school years; however, no published work has tested such age comparisons. However, if significant relations can be found that test important theoretical postulations in a population that uses CB less frequently, then it could be argued that the relations would be stronger for adolescents. However, future research should test these relations on adolescents to see whether the relations reported herein with a college-aged sample are similar or different.

Third, the measure of CB behavior was limited to only measuring CB over the Internet. A complete definition of CB should consist of other means of technology (text messaging, over video game consoles, etc.). However, text messaging is not as anonymous as other forms of media (e.g., instant messaging), and the purpose of the study was to use a measure of CB that would have variance captured by the anonymity construct. Under certain circumstances, any social media communication can be anonymous (e.g., phone numbers can be withheld, video gamers can create avatars, people can create e-mail accounts with fake names, etc.). Future research should attempt to create and validate a measure of anonymity across various platforms to get a more comprehensive measure of anonymity in the cyber-world. Additionally, the measure of CB used in the current study is similar to other validated CB scales that ask how frequently people harm others while “online” (Ybarra et al., 2007). Future research should use other CB questionnaires to determine whether the results replicate, and based on past research it should. For instance, Barlett and Gentile (2012) used the Ybarra et al. (2007) measure of CB and showed correlations similar to those presented in Table 1.
Fourth, related to the measure of CB used in the current study, no definitions or content of “mean messages” were provided. Further for ethical reasons, participants were not asked to indicate exactly what they would write if they indicated they had, in fact, written a mean online message. It was presumed that participants who score high on CB using this measure may not even remember every mean message or post. However, writing what participants consider mean messages fits the definition of CB.

Finally, future research should attempt to measure the impact of anonymity (or perceived anonymity) with other face-to-face measures. Olweus (2012) suggested that traditional bullying and CB are similar to one another; however, the reported frequency of CB is lower than traditional bullying. If that is true, then perceived anonymity should correlate with both forms of bullying to the same degree. This would specifically test whether anonymity is one defining characteristic of online versus offline aggression. However, caution must be used in doing such an analysis, because of (a) the high correlation between CB and traditional bullying (Barlett & Gentile, 2012), (b) the difficulty in measuring anonymity given the constantly shifting online-world, and (c) the difficulty in differentiating between traditional bullying from an anonymous source from CB from a known source. This is clearly an area of future work that needs attention. Furthermore, specifically related to the previous comment, future work should also attempt to develop valid and reliable measures of perceived anonymity (rather than attitudes toward anonymity) that can be assessed at the time the CB occurs.

Final Comments

Examining the predictors of CB is important. If such predictors can be tested, results replicated, and theory enhanced, then interventions can be formulated to reduce CB behavior. The current study is an important step in elucidating on what factors predict CB processes. It is clear that attitudes toward anonymity and CB reinforcement are strong predictors of CB that should be targeted in future work and interventions.

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