

CYBERBULLYING IN ADOLESCENCE: USING CROSS-LAGGED
PANEL TO EXAMINE THE RELATIONS OF CYBERBULLYING WITH
DEPRESSION, ANXIETY AND SELF-ESTEEM AMONG ADOLESCENTS

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Abstract

Cyberbullying can be defined as a hostile and aggressive behavior made through the new technologies: smartphones and internet. This study aims to examine the possible causal relations between cyberbullying and three psychological issues (depression, anxiety and self-esteem) at different status of the adolescents: cybervictims, cyberaggressors, double role and non-involved in cyberbullying (non-cyberbullying) using the cross-lagged panel method. 264 adolescents, aged between 13–18 completed several self-report scales at Time1 and at Time 2, 6 months apart. The results revealed that for non-cyberbullying adolescents, being depressed or anxious can conduct to cybervictimisation. For adolescents with cybervictim status, the anxiety can increase the cybervictimisation, and cybervictimisation diminishes the self-esteem. For adolescents with double role status, the more anxious they are, the higher level of cybervictimisation and cyberaggression they have. Also double role adolescents with high level of self-esteem will have low level of cybervictimisation. This is an important step in cyberbullying research because can be helpful in prevention and intervention programs for cyberbullying.

Cuvinte-cheie: cyberbullying, adolescență, depresie, anxietate, stimă de sine.

Keywords: cyberbullying, adolescents, depression, anxiety, self-esteem.

1. INTRODUCTION

Cyberbullying (cyber harassment or electronic bullying) is the harassment of the others through new electronic technologies, first by the internet and smart phones (Patchin & Hinduja, 2012). Definition of cyberbullying vary in literature from approaches who consider cyberbullying like an extension of bullying from school to virtual medium (Juvonen & Gross, 2008; Olweus, 2013), to approaches who state that it is a different phenomenon with different characteristics, predictors or consequences. The number of research studies on this topic has increased in the last years, but only a few are longitudinal studies.

Studies about cyberbullying found that those who were involved in cyberbullying had experience depression (Perren *et al.*, 2010; Turliuc, Măirean & Boca-Zamfir,

2020), stress, fear and shame (Hinduja & Patchin, 2007; Ybarra, 2004); they suffer from social anxiety (Juvonen & Gross, 2008) and have low self-esteem (Katzner, Fetchenhauer & Belschak, 2009). Cybervictims report feeling isolated, having academic problems (Katzner *et al.*, 2009) and psychosomatic problems, such as sleeplessness, headaches and abdominal pain (Cowie, 2011). Cyberaggressors have feelings of unsafety at school, have headaches and they are involved in anti-social behaviors, alcohol and drug abuse (Sourander *et al.*, 2010).

1.1. CYBERBULLYING AND DEPRESSION

Many cross-sectional studies have established a positive correlation between cyberbullying and depression (Aoyama, Saxon & Fearon, 2011; Betts, 2016). The relation between cybervictimisation and depression is stronger (Chang *et al.*, 2013; Erdur-Baker & Tanrikulu, 2010; Remond, Romo & Kem, 2013) than relationships between cyberaggression and depression. Studies have shown that cybervictims have more depressive symptoms than cyberaggressors, double role (Wang, Nansel & Iannotti, 2011) or those who were not involved in cyberbullying (Erdur-Baker & Tanrikulu, 2010; Ybarra, 2004). Also, research has found that adolescents who were victims of cyberbullying were more likely to have suicidal thoughts than non-victims (Hinduja & Patchin, 2010; Bonanno & Hymel, 2013). In a longitudinal study among adolescents (Gamez-Guadix *et al.*, 2013), it was analyzed the reciprocal relationships between being a victim of cyberbullying and depression, substance use and problematic internet use. Reciprocal relationships were found between cybervictimisation and depression in order that cybervictimisation leads to an increase in depressive symptoms and depression increase the cybervictimisation.

1.2. CYBERBULLYING AND ANXIETY

The research consistently reports that victims of cyberbullying have increased social anxiety (Dempsey *et al.*, 2009; Juvonen & Gross, 2008) or general anxiety (Aoyama *et al.*, 2011; Juvonen & Gross, 2008). Some research (e.g., Kowalski, Limber & Agatston, 2012) suggested that cyberaggressors have the same scores at social anxiety as adolescents who had no experience in cyberbullying and cybervictims have the highest scores of social anxiety followed very closely by double role adolescents. Several researchers have found that double role have the highest levels of general anxiety (Aoyama *et al.*, 2011; Kowalski *et al.*, 2013) or social anxiety (Antoniadou & Kokkinos, 2013; Juvonen & Gross, 2008). A longitudinal study had found a unidirectional relationship in a way that social anxiety predicted an increase in later cybervictimisation rather than the reverse (Pabian & Vandebosch, 2016). Only a few studies examined the relationships between cyberaggression and general anxiety and it was found a positive correlation of them (Aoyama *et al.*, 2011; Campbell *et al.*, 2013).

1.3. CYBERBULLYING AND SELF-ESTEEM

Several studies found that cybervictimisation is negatively correlated with self-esteem (Aoyama *et al.*, 2011; Kowalski *et al.*, 2012). In some studies, cybervictims and cyberaggressors had lower self-esteem than those with little or no experience in cyberbullying (Juvonen & Gross, 2008; Kowalski *et al.*, 2012; Patchin & Hinduja, 2010). The relationship is stronger for cybervictims than for cyberaggressors (Cénat *et al.*, 2014; Chang *et al.*, 2013; Perren *et al.*, 2010). In a study (Brack & Caltabiano, 2014) was found that double role have low scores of self-esteem, the same like cybervictims. In other study, self-esteem was found to be a predictor for both cyberaggression and cybervictimisation (Brewer & Kerslake, 2015), so the probability to be involved in cyberbullying was higher for the youth with low self-esteem. To our knowledge, no study to date has examined the longitudinal association between cyberbullying and self-esteem. It is not a positive experience to be bullied or to bully others, so this can have an influence on self-esteem.

A lot of studies have used cross-sectional designs which prevent the inferences of causal relationships among variables. The present article is the first to address the longitudinal associations of depression, anxiety and self-esteem as a predictor of cyberbullying (aggressor and victim) or as an outcome of cyberbullying (aggressor and victim).

2. METHODOLOGY

2.1. AIM

The purpose of the study was to test the reciprocal relations of cyberbullying with depression, anxiety and self-esteem among adolescents, separate for cyberaggressor, cybervictim, double role and those with no implication in cyberbullying (non-cyberbullying). We hypothesized that *for adolescents belonging to all four statuses, there is a significant reciprocal relation of cyberbullying (cyberaggression and cybervictimisation) with depression, anxiety and self-esteem, measured at Time 1 and Time 2.*

2.2. INSTRUMENTS

The Revised Cyberbullying Inventory for Students (RCBI, Tanrikulu, 2015) was adapted for Romanian population (Boca-Zamfir & Turliuc, 2018) and has 24 items, 12 for cyberaggressor form and 12 for cybervictimisation form. Participants have to response for each item using a 4 point Likert type scale ranging from 1 (none) to 4 (more than three times). The total score can vary from 12 to 48 for each scale and the higher is the score, the higher is the cybervictimisation or the cyberaggression. The Alpha Cronbach coefficients for cyberaggressor scale were 0.76 (Time 1) and 0.79 (Time 2), for cybervictimisation scale were 0.78 (Time 1) and 0.80 (Time 2).

The Beck Depression Inventory (BDI, Beck & Steer, 1984) comprises 21 items that measure depression on a scale of 0 (symptom absence) to 3 (severity of the symptom). The total score can be from 0 to 63. The Alpha Cronbach coefficients were 0.81 (Time 1) and 0.91 (Time 2).

The State-Trait Anxiety Inventory (STAI, Spielberger et al., 1983) comprises 20 items quoted on a scale of 1 (almost never) to 4 (almost always) (only the trait anxiety scale will be used as a feature). The scores can be from 20 to 80. The Alpha Cronbach coefficients were 0.85 (Time 1) and 0.88 (Time 2).

The Self-Esteem Scale (SS, Rosenberg, 1965) features 10 items using a 5 point Likert scale (1 = strong agreement, 5 = strong disagreement) and measure what a person thinks about him/herself. The scores range from 0 to 40 and higher scores indicates higher self-esteem. The Alpha Cronbach coefficients were 0.83 (Time 1) and 0.85 (Time 2).

2.4. PROCEDURE

Data were collected in two times spaced 6 months apart, in October 2016 and April 2017. After obtaining the informed consent of the school principals and of the parents, the questionnaires were administered to the volunteered adolescents during a class time. Based on the confidentiality principle, participants were not asked any identifying information. To be able to pair the questionnaires for Time 1 (T1) and Time 2 (T2), a code known only by the participant was used.

2.3. PARTICIPANTS

Participants were 269 (126 males, 143 females) whose ages ranged from 13 to 18 ($M = 15.30$, $SD = 1.68$). They were schoolchildren from Galați area. Adolescents were grouped in four statuses of cyberbullying with the median test: 105 non-cyberbullying, 38 cyberaggressors, 34 cybervictims and 92 double role.

2.5. STATISTICAL ANALYSES

To test the relationships between cyberbullying and depression, anxiety and self-esteem, we used cross-lagged panel method. First, this method was used in mass-media and it was imported in social and medical science to test causal relationships more accurate than cross-sectional studies. Cross-lagged method can be used to explore the effect of a variable on another one, measured later (Seling & Little, 2012). It is a design with repeated measure on the same sample and all the correlation scores between all the variables of the study were calculated. The cross-lagged effects (e and f) are important for causal determination (Fig. 1) and the higher value without +/- is important to establish who is the cause and who is the effect.

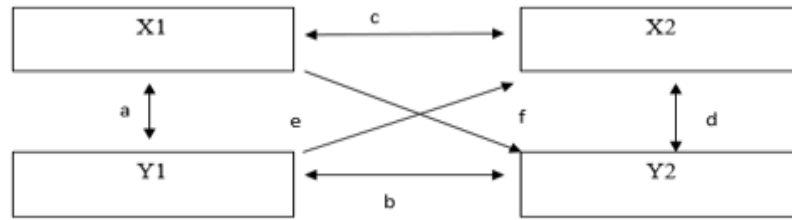
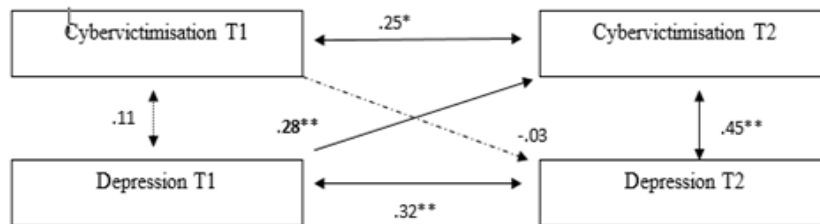
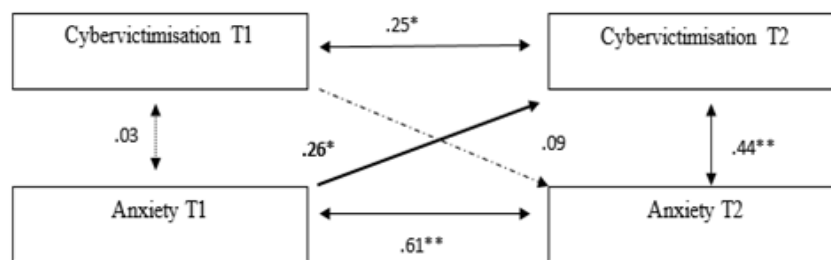


Figure no. 1. Cross-lagged panel model

3. RESULTS

Adolescents with non-cyberbullying status. For non-cyberbullying adolescents, the results show (Fig. no. 2) a significant positive correlation (mark with continues line) between depression at T1 and cybervictimisation at T2 ($r = .28, p < .001$) while the correlation between cybervictimisation at T1 and depression at T2 ($r = -.03, p > .05$) is not significant. Higher levels of depression can lead to cybervictimisation for those who were not involved in cyberbullying or had a few events of cyberbullying. Also, the presence of anxiety can increase the probability of becoming a victim of cyberbullying (Fig. 3) for adolescents.

Figure no. 2. Cross-lagged panel model for depression and cybervictimisation for non-cyberbullying; **, $p < .01$; *, $p < .05$.Figure no. 3. Cross-lagged panel model for anxiety and cybervictimisation for non-cyberbullying; **, $p < .01$; *, $p < .05$.

Adolescents with cybervictim status. For cybervictims, cross-lagged panel show a significant positive correlation between cyberaggression at T1 and anxiety at T2 (Fig. 4). In other words, the more aggressive they are, the less anxiety they feel. Also, the presence of anxiety can lead to an increase of cybervictimisation (Fig. 5) and the cybervictimisation can cause a lower self-esteem for cybervictims (Fig. 6).

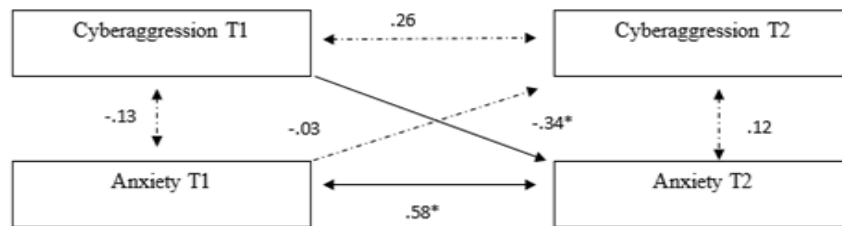


Figure no. 4. Cross-lagged panel model for anxiety and cyberaggression for cybervictims; **, $p < .01$; *, $p < .05$.

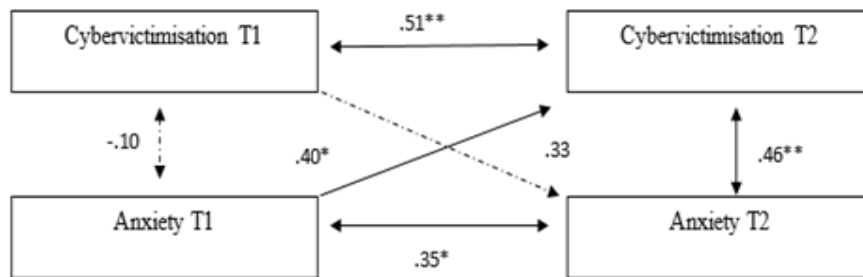


Figure no. 5. Cross-lagged panel model for anxiety and cybervictimisation for cybervictims; **, $p < .01$; *, $p < .05$.

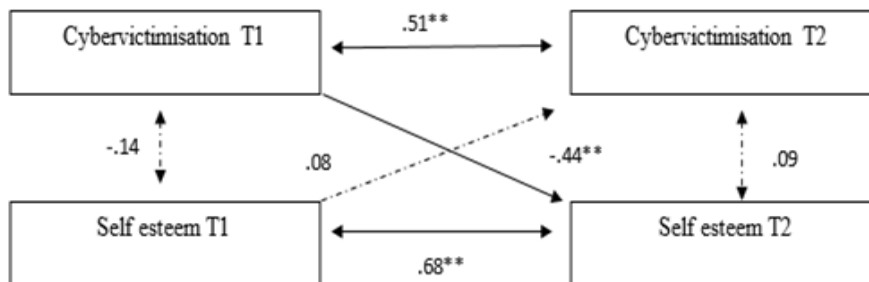


Figure no. 6. Cross-lagged panel model for self-esteem and cybervictimisation for cybervictims; **, $p < .01$; *, $p < .05$.

Adolescents with cyberaggressor status. In their case, we did not find any significant correlations between the levels of the cyberaggressivity or cybervictimisation and the internalizing behavior (depression, anxiety and self-esteem).

Adolescents with double role status. For double role, the results indicate (Fig. 7) a significant positive correlation between anxiety at T1 and cyberaggression at T2 ($r = .21, p < .05$), and it has a higher value than the correlation between cyberaggression at T1 and anxiety at T2 ($r = .01, p > .05$). We can say that, for double role adolescents, higher anxiety can determine a higher level of cyberaggression.

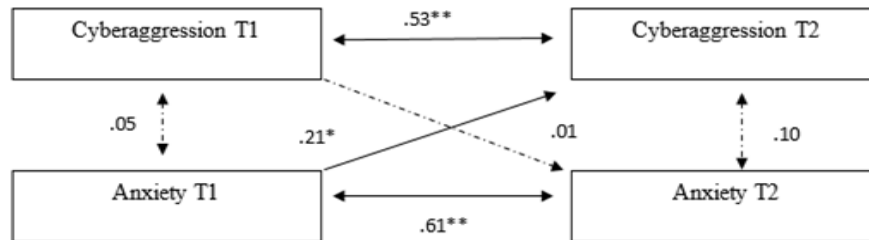


Figure no. 7. Cross-lagged panel model for anxiety and cyberaggression for double role; **, $p < .01$; *, $p < .05$.

Between anxiety and cybervictimisation (Fig. no. 8) there is a reciprocal relation: anxiety can lead to cybervictimisation and vice versa but if we consider the value of correlation, for double role adolescents, the presence of anxiety can determine a higher cybervictimisation. Also, the relation between self-esteem and cybervictimisation is a reciprocal one (Fig. no. 9). The higher value is between self-esteem at T1 and cybervictimisation at T2 so double role adolescents with lower self-esteem, will have higher cybervictimisation.

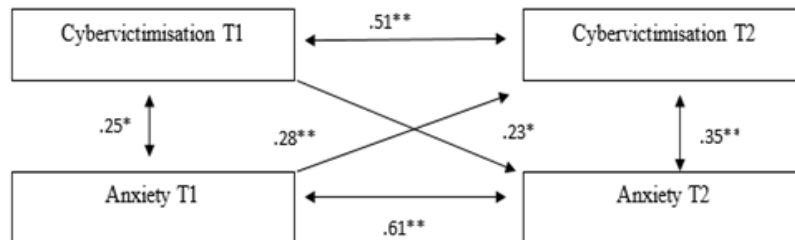


Figure no. 8. Cross-lagged panel model for anxiety and cybervictimisation for double role; **, $p < .01$; *, $p < .05$.

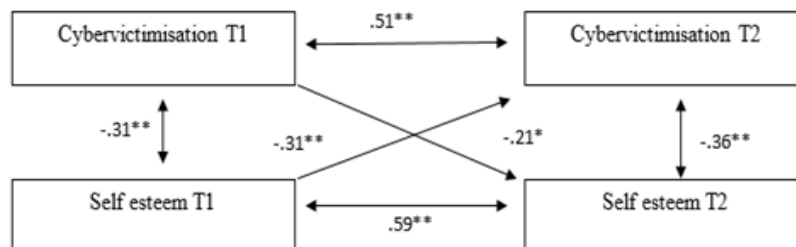


Figure no. 9. Cross-lagged panel model for self esteem and cybervictimisation for double role; **, $p < .01$; *, $p < .05$.

4. DISCUSSIONS

This longitudinal study makes a first step to causal research in the field of cyberbullying and internal problems of adolescents (depression, anxiety and self-esteem) using the cross-lagged panel.

Results revealed that for non-cyberbullying adolescents, the depression and the anxiety can be predictors for cybervictimisation. These results are consistent with other studies which observed that depression and anxiety correlate with cybervictimisation (Aoyama *et al.*, 2011; Chang *et al.*, 2013, Erdur-Baker & Tanrikulu, 2010; Remond *et al.*, 2013, Wang *et al.*, 2011). One possible explanation of the fact that depression and anxiety can predispose to cybervictimisation is offered by the interpersonal stress generation model (Gamez-Guadix *et al.*, 2013). Adolescents with symptoms of depression and anxiety may have fewer social skills and feelings of loneliness and isolation, that makes them less attractive to peers and that increase the cybervictimisation.

For cybervictims adolescents, anxiety can be a precursor of cybervictimisation and the increase of cyberaggression can lead to a lower anxiety. Anxious adolescents may use aggression to revenge in on-line medium which it is much easier than in real world (König, Gollwitzer, & Steffgen, 2010). Also, aggression can be a way to release the anger, having a catharsis function for emotions like anxiety. Cybervictimisation get to lower self-esteem for cybervictim adolescents. This negative correlation was found in other studies, too (Aoyama *et al.*, 2011; Kowalski *et al.*, 2012; Patchin & Hinduja, 2010). For construction of the self-esteem, the feed-back of other persons is important. So, for cybervictims who receive different rude and negative comments online, the self-esteem will be affected.

For double role adolescents, anxiety can predict cyberaggression which is different than for cybervictims. For cybervictims, the aggression has a role of revenge and emotional relief of anxiety, but for double role adolescents the more anxious they are, the more aggressive they behave. Also, for double role adolescents the anxious symptoms and a low self-esteem can lead to an increase of cybervictimisation and these relationships are reciprocal. These findings are consistent with those of Aoyama and his colleagues (2011), and Chang and his colleagues (2013). If we take into account both anxiety and self-esteem, we can say that for adolescents with double role status there is a negative cyclicity: higher anxiety and low self-esteem will lead to higher cybervictimisation, and this higher cybervictimisation will determine then an increase of anxious symptoms and a lower self-esteem.

In the case of cyberaggressors, the lack of significant correlation among all studied variable may indicate that other aspect and factors are more associated with their externalizing behavior, such as their low resistance to frustration and their reduced emotional regulation skills (Turliuc *et al.*, 2020).

Several limitations of this study should be considered. First, because the research focuses on adolescents, the generalization of the results to other groups is limited. Secondly, the modest sample size for each cyberbullying group could affect

the research findings. Future research could aim to investigate a larger and targeted sample. Thirdly, we used self-report measures and the time interval between tests can be relatively short, so future research can use longer term designs and other sources of information about the phenomenon. Last, there are some limits of using the cross-lagged panel method in research, but the results obtained by this approach can be the first step to explore the direction and the relations between variables over time.

Despite these limitation, the findings contribute to an emerging literature on the subject of cyberbullying and psychological problems during adolescence. Like we said before, this is one of the first study to examine the possible causal relationships in a longitudinal research for each statuses in cyberbullying and it will be helpfull for future research to replicate these results.

For the effectiveness of intervention programs used in cases of cyberbullying, it is important to consider the position and role that a teenager has in the phenomenon of cyberbullying. We hope that our research will contribute to the field of cyberbullying literature and interventions due to its longitudinal causal conclusions and to the usefulness of our results in the design of cyberbullying prevention and intervention programs.

5. CONCLUSIONS

This is one of the first studies that has investigated longitudinally the causal and bidirectional relationships between cyberbullying and internalizing behavior of adolescents (depression, anxiety, and low self-esteem). Our results indicate that higher levels of depression and anxiety can lead to cybervictimisation for those who are not involved in cyberbullying. Similarly, higher levels of anxiety can lead to victimisation in the case of cybervictims. For cybervictims, more cyberaggressive they are, less anxious they feel, cybervictimisation inducing a lower self-esteem. For double role adolescents, higher anxiety can determine a higher level of cyberaggression, higher anxiety and lower self-esteem can determine a higher level of cybervictimisation and, vice-versa, higher cybervictimisation can lead to higher anxiety and lower self-esteem.

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REZUMAT

Cyberbullying-ul este un comportament ostil și agresiv realizat prin intermediul noilor tehnologii: smartphone și internet. Scopul acestui studiu este să cerceteze posibilele relații cauzale între cyberbullying și trei probleme psihologice (depresie, anxietate și stima de sine) pentru diferite statusuri din adolescență: cybervictimă, cyberagresor, dublu rol și neimplicat în cyberbullying (non-cyberbullying) folosind metoda corelațiilor încrucișate. 264 de adolescenți cu vârsta cuprinsă între 13 și 18 ani au completat chestionarele în două momente temporale, distanțate la 6 luni. Rezultatele arată că pentru non-cyberbullying, a fi depresiv sau anxios poate favoriza cybervictimizarea. Pentru adolescenții ce sunt victime în cyberbullying, anxietatea poate crește victimizarea și cybervictimizarea determină o scădere a stimei de sine. Pentru adolescenții cu dublu rol, pe măsură ce anxietatea crește, va crește și nivelul cybervictimizării și al cyberagresivității. Adolescenții cu dublu rol care au stima de sine ridicată, vor avea scoruri scăzute ale cybervictimizării. Aceste date sunt importante în cercetarea privind cyberbullying-ul deoarece pot fi utilizate în proiectarea programelor de prevenție și intervenție pentru cyberbullying.