ORIGINAL RESEARCH

Mediating Role of Self-Control in the Relationship between Aggressiveness and Cyber Bullying

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Abstract

Objective: The aim of this study is to put forward the mediating role of self-control in the relationship between adolescents' aggressive behaviors and their cyber bullying behaviors.
Methods: The study group included 333 high school students. The data was collected through the Positive Social and Aggressive Behaviors Scale, the Brief Self-Control Scale and the Cyber Victimization and Bullying Scale. To analyze the data, the LISREL 9.1 and SPPS 22 program was used. In the study, to calculate the indirect effect estimates of the variables, the SPSS Macro Process program was used. If the mediating role was statistically significant or not was tested through using the bootstrap test was calculated.
Results: According to the relational results of the study, it was found that there is a positive and moderate relationship between aggression and cyberbullying. A moderate, negatively significant relationship was found between aggression and self-control. It was determined that there is a moderate and negative relationship between self-control and cyberbullying. As a result of the study, it was determined that the aggressive behaviors predicted cyber bulying behaviors at a significant level. Another result of the study was that self-control played mediating role in the relationship between the aggressive behaviors and the cyber bullying behaviors.
Conclusion: According to these results, self-control play an mediating role in the relationship between high school students' aggressive behaviors and their cyber bullying behaviors.
Keywords: Aggressive Behaviors, Cyber Bullying, Self-Control, Mediating

INTRODUCTION

One of the most evident characteristics of the period in which we are is the developments lived at an unprecedented pace in technology. These developments observed in technology have led to important changes in individuals' lives (1). As examples of these changes can be given the establishment of communication with others by using information and communication technologies, creation of social environment, instant messaging, reaching videos, playing games, sharing information-documents, doing, (2). reaching information, doing research, problem solving, creativity, critical thinking (3).

While the use of these technologies by children, adolescents and adults leads to positive results, the abuse of them may lead to negative results. It is reported that the excessive, uncontrolled, incorrect and insensible use of information and communication technologies seen especially in adolescents at school age affects both their personal development and academic success negatively (4). Moreover, the report that as the duration of internet use increased, so did the aggressiveness in children and adolescents (5). can be mentioned among the results of the negative use of information and communication technologies.

The negative use of communication technologies by adolescents is called cyber bullying. Cyber bullying is defined as intentional and repeated aggressive behaviors via electronic devices (6). It is reported that cyber bullying occurs via electronic ways over smart phones, computers, tablets by means of various communication methods including websites, instant messaging, e-mails, online game sites, chat rooms, digital images (7). It is

emphasized that lack of face-to-face communication, social restriction and control when using information and communication technologies causes cyber bulying behaviors to appear (8).

Moreover, the prevalence of cyber bullying has been studied by many researchers as well. Williams and Guerra (9). reported that the rate of cyber bullying events among the secondary and high school students was 9%. It was stated that in European countries individuals aged between 9-16 years were exposed to cyberbullying behaviors at the rates changing from 2% to 14% and 3% exhibited cyberbullying behaviors (10). It was reported that in the USA 8% of the individuals aged between 10 to 15 years were exposed to damaging behaviors in the internet environment (11).

In another study carried out with students aged between 13-18 years, too, it was determined that 49% of the participants were cyber victims and 21% exhibited cyber bullying behaviors (12). It is observed that cyber bullying is prevalent among students in the adolescence period. Approximately half of the adolescents in Canada are cyber victims, and one in three students is found to be a cyberbully (13).

In relation to the prevalence of cyber bullying among studentsin Turkey, in the first study carried out by Erdur-Baker, Kavşut (14), it was determined that 28% of the high school students exhibited cyber bullying behaviors and 30% of them were exposed to cyber bullying behaviors. Eroğlu and Peker (15) (2015) found that 9% of adolescents were cyberbullying, and 7% experienced cyber victimization. Moreover, In another study, it was determined that 7% of high school students were cyberbullying and 9% were cyber victims (16).

It is reported that besides cyber bullying's being prevalent especially among high school students, cyber victims live psychological, emotional and social problems (17, 18). However, it is stated that cyber bullying leads to psychological maladaptation (19). Moreover, it is reported that it results in weak academic performance (20). It is emphasized that cyber bullying results in depression, low self-esteem, anxiety, decrasing concentration, self-harming, thought of suicide and suicide (21, 22, 7).

Aggressive Behaviors

Aggressiveness is defined as behaviors which members of the same kind exhibit to harm one another (23). Aggressive behaviors are usually described as behaviors which are exhibited with the aim of harming others. Verbal and physical actions exhibited directly in interpersonal situations are included in this definition (24). Aggressiveness has physical (25), indirect (26), relational (27) and social (28) types.

Researchers state that adolescents may sometimes use the internet in a way to exhibit aggressive behaviors towards others as well (29, 30). When the literature is examined, it is observed that a relationship was found between aggressiveness and cyber bullying in many studies (31, 32, 33, 34).

Self-Control Theory

Self-control includes an individual's delaying momentary pleasures, controlling negative emotions, working persistently to fulfill an assigned duty and inhibiting impulsive behaviors (35). Self-control is defined as the regulation of emotions, beliefs and behaviors in order to establish healthy relationships with others (36).

The ability of inhibiting pleasure-giving impulses composing an important dimension of self-control and leading to behaviors resulting in addiction has a critical importance in an individual's becoming successful in life. It was found that children having the ability to inhibit pleasure-giving impulses leading to behaviors resulting in addiction had higher school success. It was reported that students with high self-control had higher academic success (37), showed psychological adaptation and affected interpersonal relationships in a positive way (38).

It was expressed that, in individuals with low self-control, such behaviors as committing crimes and violence (39), anger (40) and drug addiction (41) are more frequently observed. Some researchers reported a relationship between low self-control and aggressiveness (42, 43).

The Mediating Role of Self-Control

Self-control means controlling one's cognition, emotion and behavior (44). Again, self-control is defined as the ability to control one's behavior in order to achieve long-term goals (45). When previous studies are examined, it can be said that aggression is an important factor leading to cyberbullying (46). Moon and Alarid (2015) state that low self-control can lead to bullying behaviors (47). Individuals with low self-control may engage in aggressive behavior (48, 49). Low self-control can be effective in showing violent behavior (50). However, decreased self-control can increase aggressive behavior (42).

Individuals who develop self-control may be more likely to comply with social norms (39). However, individuals with low self-control can act according to enjoyment without thinking too much about the consequences of their behavior (51). In this context, it is thought that self-control includes features such as regulating emotions, reducing negative thoughts and controlling behavior (52). As a matter of fact, individuals with high self-control can manage their anger better (38).

Based on the theoretical support and explanations above, the current study predicts that adolescents who display aggressive behavior will commit cyberbullying. Self-control is thought to decrease the relationship between these two variables. Previous studies have revealed the relationships between low self-control and cyber-risky lifestyles (53), the differences between self-control and cyberbullying and not (54), and the relationships between online activities, self-control and cyberbullying tendencies (55). In the studies, it was found that the sample group was not taken from high school students; It is seen that it consists of individuals who study at secondary school or university. In addition, it is observed that these studies do not examine the mediating role of self-control in the relationship between aggression and cyberbullying. It differs from other studies in that the participants of this study are both high school students and the cyberbullying scale, which has three different dimensions, is used. However, the current study is expected to contribute to the literature in terms of presenting which factor will affect the relationship between aggression and cyberbullying. This approach can provide a comprehensive framework for understanding cyberbullying dynamics and the situations in which it occurs.

The Present Study

Young people's using information and communication technologies intensively brings about some problems, too. It is reported that if young people raising in the digital age spend time in virtual environment unrestrainedly, this brings along a great risk for cyber bullying behaviors (6). However, that young people have the opportunity to connect the internet in every environment might result in their being exposed to cyber bullying behaviors at any time. For example, by opening fake accounts on social media, individuals may try to revenge even with others or friends who bully them in the virtual environment.

The purpose of this research is to examine the mediating role of self-control between aggression and cyberbullying. Based on previous studies, it was predicted that aggression contributes to cyberbullying behavior and that self-control can mediate the relationship between aggression and cyberbullying. Hence, it was assumed that self-control could mediate the relationship between aggression and cyberbullying. In other words, while aggression increases cyberbullying behaviors, it is expected that the level of these negative behaviors will decrease through self-control.

In this direction, the hypotheses of the research are presented below.

1. Aggression will significantly predict cyberbullying behaviors.
2. Self-control will significantly predict cyberbullying behaviors.
3. Self-control has a mediating role in the relationship between aggression and iberian bullying.

METHODS

Research Model

In this study was used relational research model. This model is a method used to reveal the influence levels of variables used in research (56).

Study Group

The G* power 3.1.9.4 program was used to calculate the sample size. In the G*power program; .051 effect size, 5% margin of error, 95% confidence interval and minimum sample size for 3 independent variables were calculated as 333. The output of the analysis is given in figure 1.

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F tests – Linear multiple regression: Fixed model, R² increase
Analysis:   Sensitivity: Compute required effect size
Input:      α err prob                        = 0.05
            Power (1 –β err prob)             = 0.95
            Total sample size                 = 340
            Number of tested predictors       = 3
            Total number of predictors        = 6
Output:     Noncentrality parameter λ         = 17.3728863
            Critical F                        = 2.6317301
            Numerator df                      = 3
            Denominator df                    = 333
            Effect size f²                    = 0.0510967
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Figure 1. G * Power sample size calculation output

The study group was composed of a total of 333 9th, 10th, 11th and 12th grade students selected from three different types of schools in Erzurum province of Turkey in the 2020-2021 educational year. 202 (60,7%) of the students in the study group were female and 131 (39,3%) of then

were male. The ages of the participant students varied between 14 and 18 years. Due to the Covid-19 outbreak, data were collected online, both because restriction measures were in place and students did not receive face-to-face training. Used snowball sampling method to identify participants to participate in the study. The scales prepared online were first given to a high school student and asked to pass it on to others. 342 people were reached in this way.

Descriptive statistics regarding the demographic data of the participants are given in Table 1.

Table 1. Information on the individuals participating in the study

Gender	N	%
Female	202	60,7
Male	131	39,3
Grade	N	
9,00	101	
10,00	89	
11,00	143	
Age	N	%
14,00	10	3,0
15,00	93	27,9
16,00	90	27,0
17,00	132	39,6
18,00	8	2,4
Total	333	100

Data Collection Tools

Personal Information Form: In the study, information such as gender, age, grade level, type of school and getting a mental diagnosis was obtained with a personal information form. It was observed from the responses of the participants that there were no individuals with any psychiatric diagnosis.

Cyber Victimization and Bullying Scale (CVBS): Çetin, Yaman, and Peker (2011) developed the scale. (57) was used. The scale was composed of two dimensions, namely cyber victimization and cyber bullying, 22 questions and a 5-point Likert type grading. However, in the scale, there are three sub-dimensions, namely cyber verbal bullying (CVB), hiding identity (HI) and cyber forgery (CF). For this study, the cyber bullying form of the scale was used. The general internal consistency coefficient of the Cyber Bullying Scale (CBS) was found as .89; it was determined as .81 for the CVB sub-dimension, .69 for the HI sub-dimension and .83 for the CF sub-dimension. The test-retest reliability coefficients of the scale was found .90 for the CBS, .73 for the CVB and .72 for the HI and .86 for the CF sub-dimensions.

Brief Self-Control Scale (BSCS): Another scale used in the study was adapted by Nebioğlu, Konuk, Akbaba and Eroğlu (58) into Turkish. The sale was composed of the sub-dimensions of impulsivity and self-discipline. In the confirmatory factor analysis, the fit indices values of the BSCS were found as RMSEA=.043, CFI=.98, GFI=.99. The general reliability coefficient of the scale was found as .83; for the impulsivity sub-dimension, it was found as .81; for the self-discipline sub-dimension, it was found as .87. The test-retest reliability was found as .88 for the whole of the scale; for the impulsivity sub-dimension, it was found as .83; for the self-discipline sub-dimension, it was found as .85.

Positive Social and Aggressive Behaviors Scale (PSABS): In order to measure the students' aggressive behaviors, the Positive Social and Aggressive Behaviors Scale developed by Boxer, Tisak and Goldstein (2004) was used. The scale was adapted by Bayraktar, Kindap, Kumru and Sayıl (59) into Turkish. The scale was composed of four sub-dimensions, namely Aggressive Behavior, Reactional Positive Social Behavior, Goal-Oriented Positive Social Behavior and Altruistic Positive Social Behavior. The scale was prepared in accordance with the 4-point grading. High scores obtained from each scale indicate that the behavior belonging to that sub-dimension is exhibited more frequently. The internal consistency coefficients of the scale was found as .90 for the Aggressive Behavior sub-dimension, .78 for the Reactional Positive Social Behavior, .84 for the Goal-Oriented Positive Social Behavior and .75 for the Altruistic Positive Social Behavior. In this study, only the Aggressive Behaviors Scale was used.

Data Collection Process

Due to the COVID-19 outbreak, research data were collected online, as educational activities were conducted online. Hence, the scales were sent to the participants via e-mail from the online data collection address prepared by Google Forms. Moreover, the informed consent of the individuals that accepted to take part in the study was before their participation. It was made sure that only volunteers were included in the study. Moreover, the individuals were informed that they could stop filling the scales whenever they wanted and that the results would be held confidential. The online data collection process was completed within 5 days

Statistical Analysis

The data that had been collected online was analysed in computer environment. Since the system did not

allow to proceed to the next question without marking the previous one, there was no incomplete data. As a result, 342 individuals filled in the scales. Before the analysis of the data, discrepancy and normality values were examined. After this process, it was determined that the data of 9 individuals violated the parametric conditions, and hence those data were removed from the data set. At the last stage, for the test of multivariate normality of the data set, Mardia's skewness and kurtosis values of the observed variables were examined by using Lisrel 9.1 software. After this process, it was observed that the assumption of multivariate normality was confirmed (p>.05). After all these processes, the analysis was carried out with a data set of 333 participants.

In the study, with the aim of determining the direct effects of aggressive behaviors on self-control and on cyber bullying behaviors and also their indirect effects over self-control and the direct effects of self-control on cyber bullying behaviors, the structural equation modelling (SEM) analysis was used. SEM analysis was made by using the LISREL 9.1 programs. In the study, in order to be able to calculate the indirect effect estimates of the variables, the SPSS-22 Macro Process program was used. If the indirect effect was significant was tested via using the bootstrap test.

RESULTS

Correlations Between Variables

The Pearson correlation coefficients, mean, standard deviation, skewness and kurtosis values of the aggression, self-control and cyber bullying variables in the study are given in Table 2.

Table 2. Correlations of Variables with Each Other, Descriptive, Skewness and Kurtosis Values

Variables	1	2	3
1. Cyber Bullying	1		
2. Aggressive Behaviors	.48*	1	
3. Self-Control	-.35*	-.34*	1
$\bar{x}$	28.16	15.42	30.57
Sd	7.45	4.99	5.49
Skewness	1.43	1.32	-.26
Kurtosis	1.65	1.50	.52

*p<.05

When the correlations between the variables in Table 2 were examined, it was found that there was a positive relationship between the variables of cyber bullying and aggressive behaviors at a moderate level, a negative relationship between the variables of cyber bullying and self-control at a moderate level and a negative significant relationship between the variables of aggressive behaviors and self-control at a moderate level.

The Mediating Role of Self-Control Between Aggression and Cyber Bullying

In the study, the hypothetically established model was tested via using the path analysis. For the mediation relationship in the hypothetic model, a three-stage procedure is required. First, the independent variable is required to predict the dependent variable and the mediating variable significantly. Second, the mediating variable is required to predict the dependent variable significantly. Third, when the mediating variable is controlled, there must be a significant decrease in the amount of the relationship between the independent and the dependent variable or this relationship must not be statistically significant (60).

Measurement Model

The measurement model was established with 3 latent variables (aggression, self-control, cyber bullying) and 15 observed variables. The established measuring model was found to fit well [χ^2/sd=3.05, GFI=.91, CFI=.96, NFI= .94, IFI= .96, SRMR= .055 ve RMSEA=.079]. Besides, it was found that all observed variables place a significant load on the relevant latent structures (p<.01 between .40 and .73).

Structural Model

Three models were established during the research process. In this context, the relationship between agression and cyber bullying was first examined (Model I). In Model 1, the researchers determined that the predictor effect of agression on cyber bullying was significant (β = .59, t = 8.50, p < .01). It can be said that the goodness of fit indices of the structural model are acceptable (Table 3). After the level of predictor between agression and cyber bullying was determined, agent variables were added to the model and the path from agression to cyber bullying was removed (Model II). Considering the goodness of fit indices of the structural model at this stage, it can be said that all values are acceptable (Table 3). Finally, the model with intermediary variables in the relationship between agression and cyber bullying was established and the path between agression and cyber bullying was drawn (Model 3). Considering the goodness

of fit indices of the structural model in which self-control are mediating, it can be said that all values are acceptable (Table 3). The lack of a statistically significant path to cyber bullying from agression shows that there is an mediating relationship (β = .35, t = 2.90, p< .01).

Considering all fit indices' values, it can be said that self-control have an mediating role in the relationship between agression and cyberbullying.

Model fit indices are shown in Table 3.

Table 3. Model Fit Indices

Model	χ2/df	GFI	CFI	NFI	IFI	SRMR	RMSEA
Model I	2.95	.92	.97	.95	.97	.050	.077
Model II	3.04	.91	.96	.94	.96	.055	.078
Model III	3.05	.91	.95	.94	.96	.054	.079

Not: χ2 = Chi-square; df = Degree of freedom, GFI= Goodness of fit index; CFI= Comparative fit index; NFI= Normed fit index; IFI= Incremental fit index; SRMR= Square root of standardized mean square error; RMSEA= Root mean square error approximate

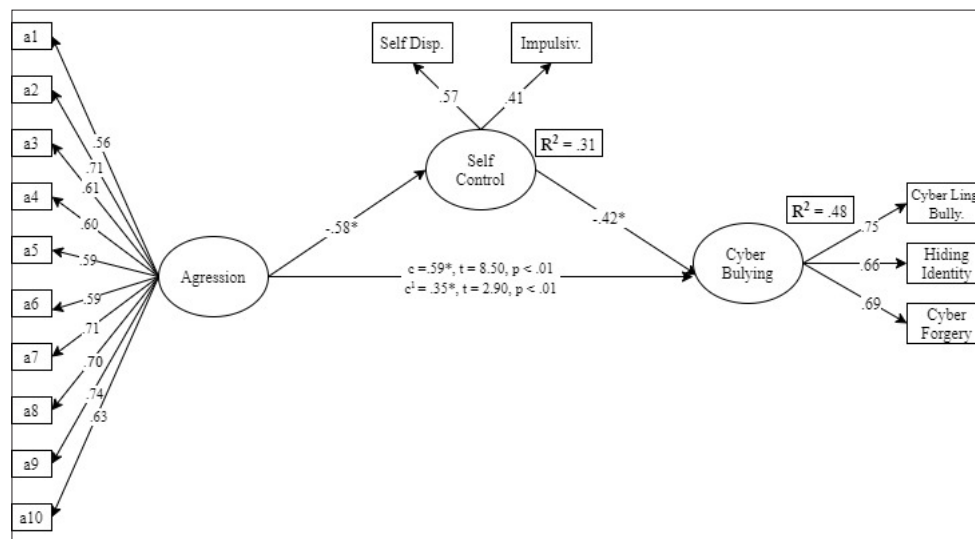Figure 2 shows the path diagram for the mediating model.

Figure 2. The Mediating Effect of Self-Control in the Relationship Between Aggression and Cyber Bullying

As seen in Figure 2, it is seen that aggression predicts cyber bullying positively, aggression self-control negative, self-control negatively and significantly predicts cyber bullying. However, it has been observed that self-control reduces the relationship between aggression and cyber bullying.

Bootstrapping Process

The bootstrapping method was used to determine the direct and indirect effects of structural equality modeling, established regarding that self-control have mediating role in the relationship between agression and cyber bullying of the students. Coefficients for direct and indirect effects resulting from this operation and the confidence intervals for these coefficients were presented in Table 4.

Table 4. Bootstrapping Process for The Mediating Model

Paths	Estimated	%95	
		Lower	Upper
Direct Effect			
Agression Cyber bullying	.61	.454	.704
Agression Self-Control	-.38	-.765	-.366
Self-Control Cyber bullying	-.28	-.823	-.186
Indirect Effect			
Agression (Self-Control) Cyber bullying	.11	.029	.542

When the coefficients for direct and indirect effects between the variables in Table 4 and the confidence intervals related to these coefficients are examined, it is noteworthy that the direct paths between variables are significant (61). Accordingly, it can be stated that aggression affects cyber bullying through self-control (bootstrapestimate = .11, %95 CI = [.029 −.542]).

DISCUSSION

In the present study, the mediating role of self-control in the relationship between aggression and cyberbullying was examined using Gottfredson and Hirschi's (1990) theory (39).According to the relational results of the study, it was found that there is a positive and moderate relationship between aggression and cyberbullying. A moderate, negatively significant relationship was found between aggression and self-control. It was determined that there is a moderate and negative relationship between self-control and cyberbullying. In this study, it is observed that the existing effect of aggression on cyber bullying disappears with the effect of self-control. In other words, it can be said that increased self-control can reduce cyberbullying behaviors.

From the research findings, it can be stated that aggressive behaviors predicted cyber bullying behaviors significantly. In the established structural equalition modelling, it was observed that the aggressive behaviors accounted for 35% of the cyber bullying behaviors. That it was reported in many studies that there was a relationship between aggressiveness and cyber bullying shows consistency with the result of this study (31, 33, 15, 34, 62).

The internet provides individuals with many opportunities such as continuing their aggressive behaviors in real life, hiding their virtual environment identity and thinking that their behaviors will go unnoticed (1, 62). For this reason, people may carry their anger, hostile intention and desire to take revenge in real life to the virtual environment by using the information and communication technologies.

In another finding of the study, it was determined that self-control significantly predicted cyberbullying behaviors. In other words, it can be said that self-control reduces the effect of adolescents' aggressive behavior on cyberbullying. It can be stated that since self-control achieves adaptation, delay of pleasure-giving impulses, suppression of impulsive behaviors and regulation of verbal and motor actions in the absence of others, it contributes to the prevention of cyber bullying behaviors. For this reason, it can be stated that self-control has a protective effect on cyber bullying. It can be predicted that if adolescents using the information and communication technologies intensively as a part of their daily life have a high self-control, this may have them use these means in a way not to harm others.

Researchers emphasize that individuals with low self-control is a risk factor for showing cyber bullying

behavior (63, 64). Moreover, it is reported that low self-control may exhibit risky behaviors in the virtual environment and be busy with harmful behaviors by interpreting the online environment incorrectly (65). Moreover, individuals may exhibit angry reactions in discussions in the virtual environment and their online impulsivity may increase for such reason as lack of social clues, anonymity, empathic failure. As a matter of fact, that impulsivity predicts cyber bullying supports this finding (66). For this reason, impulsivity and low self-control may increase the possibilty of exhibiting cyber bullying behaviors.

In another finding of the study was that self-control had mediating role in the relationship between aggressive behaviors and cyber bullying behaviors. This finding shows consistency with the research results revealing the fact that low self-control leads to cyber bullying (64, 51, 65). In other words, the statement that low self-control increases cyberbullying behavior is similar to the results of this study (53, 67). This reached result can be evaluated as an important finding because it indicates how the relationship between aggressiveness and cyber bullying takes place and also it makes a contribution to works for intervention in cyber bullying. According to the self-control approach, individuals with low self-control are more inclined to commit crimes or exhibit crime-like behaviors. Crime-like behaviors include behaviors to satisfy desires whose long-term results will be harmful immediately. Smoking, using alcohol, using illegal drugs, having an illegitimate child and exhibiting risky sexually explicit behaviors are examples of crime-like behaviors (68). In this context, cyber bullying can be evaluated within the scope of crime-like behaviors. Hence, individuals with low self-control may not only exhibit risky behaviors like aggressiveness in real life, but they may also exhibit similar behaviors by using communication technologies.

It can be stated that since self-control includes such features as regulating individuals' emotions (69), delaying pleasure-giving activities preventing decision-making and goal-reaching (70), maintaining interpersonal and social relationships (38, 71), it can prevent individuals from exhibiting cyber bullying behaviors. In other words, since individuals with high self-control control thier negative emotions and regulate their thoughts and behaviors, they avoid exhibiting bullying behaviors in their relationships in the virtual environment. It can be considered that expressing emotions more healthily by taking such emotions as anger, vengeance and hostility leading especially to aggressive and cyber bullying

behaviors under control will contribute to the prevention of cyber bullying. In this context, it can be stated that the findings that understanding emotions (33) and empathy predicted cyber bullying negatively (72) and shame/ guilt and sense of vengeance were significant predictors of cyber bullying (12) support the findings obtained from ths study. Moreover, since individuals with high self-control regulate and control their thoughts and behaviors, prevent pleasure-giving impulses, it is not likely that they exhibit aggressive reactions in their relationships in the virtual environment.

Limitations and Suggestions

The results obtained from this study should be evaluated with some limitations. The pieces of data obtained from the study were collected via scales based on self-report. For this reason, the students' aggresiveness, self-control and cyber bullying levels are limited to their own perceptions. That the study group was composed of the students taking education at high schools in a province in Turkey is a limitation before the generalizability of the findings. For this reason, similar studies to be made both in different provinces and countries may contribute to the generalizability of the results.

When the obtained results are evaluated together with these limitations, it can be stated that it will provide an important source for programs aiming to prevent adolescents' cyber bullying behaviors. In cyber-bullying prevention programs, individuals' self-control levels should be determined. When applying interventions aiming to decrease individuals' cyber bullying behaviors, activites to increase their self-control levels should be included.

Statement of Ethics: Before starting the study, permission to conduct research was obtained from Atatürk University Educational Sciences Unit Ethics Committee. (date/number:01.10.2020/56785782-050.02.04-E.200.025.0514, 12/12).

Disclosure Statement: No conflict of interest has arisen between the authors during the preparation and reporting of the research.

Author Contributions: As a result of the literature review of the related field, AP and MNY came up with the research idea together. AP ethics committee approvals and official permission to apply the scales. In addition, AP conducted the data collection process. Transferring the collected data to the computer environment and examining their suitability for analysis was done by MNY. Introduction and methodology of the study MNY, findings and discussion sections were written by AP.

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