



# Exploring causes and predictors of cyberbullying in gifted and non-gifted students: Academic success, psychological variables, parental and educators' supervision, motivation, and reactions to cyber victimization

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## Abstract

The purpose of this study is to explore the motivation of cyberbullying behaviors, their reactions to these behaviors, and the predictors of cyberbullying sensibility in gifted and non-gifted students. The study reached 258 participants, including 102 gifted and 156 non-gifted students. This research is a descriptive survey model. The study performed descriptive statistics, independent samples t-test, ordinal logistic regression analysis, and structural equation modeling to examine the status of the variables examined according to gifted and non-gifted students. The most important reason for cyberbullying behaviors in both gifted and non-gifted students was to take revenge, and the least important reason was to adapt. The most common reaction to cyber victimization is deleting shares or files that may cause harm. Gifted and non-gifted female students have more cyberbullying sensibility. Gifted students with a high academic average have more cyberbullying sensibility. In addition, students with gifted and non-gifted internal functional regulation of emotions skills have more cyberbullying sensibility. Students with low external dysfunctional regulation of emotions scores also have more cyberbullying sensibility. The results confirmed the importance of identifying students at risk, identifying the distinguishing factors for cyberbullying behaviors of gifted and non-gifted high school students, and evaluating the sources and reactions of cyberbullying behaviors. These results will provide important input for school-based prevention studies.

**Keywords** Cyberbullying sensibility · Gifted students · Academic success · Psychological well-being · Regulation of emotions skills · Parental supervision

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## Introduction

The intensity of the use of social networks and the prevalence of mobile devices provide essential opportunities to connect with different people and create online communities based on their interests (Evangeliou et al., 2022; Yildiz Durak, 2018). Constantly active communication and interaction opportunities with social media environments and instant messaging applications prepare the environment for the emergence of new types of social relations and behaviors (Yildiz Durak & Saritepeci, 2019). However, these environments may expose children and adolescents to significant risks, such as cyberbullying. Cyberbullying is a deliberate, systematic, and aggressive act using an internet-connected device. Cyberbullying is a form of bullying that poses a threat to all age levels due to the widespread use of social media, simple information sharing, and anonymity

(Peter & Petermann, 2018). Cyberbullying behaviors have many psychological, social, physical, and academic effects. Evangelio et al. (2022) highlighted the effects of cyberbullying on the psychological health of victims, such as anxiety, depression, stress, and frustration. Yildiz Durak and Saritepeci (2020) highlighted that cyberbullying behaviors are also associated with subjective well-being, aggressive/cyberbullying behaviors, loneliness, low academic success, and low self-confidence behaviors.

Exposure to cyberbullying behaviors increases the likelihood of both being a victim of cyberbullying and becoming a cyberbully, creating a snowball effect. For this reason, actions aimed at preventing these behaviors are considered significant in preventing the increasing rate of these behaviors. Atman-Uslu and Yildiz-Durak (2022) considered cyberbullying as an important problem in educational environments. According to Byrne (2021), cyberbullying affects the majority of students and is a barrier to participation in widespread collaborative online learning environments. Additionally, exposure to cyberbullying prevents students from participating in many learning platforms online to avoid future bullying. Preventing cyberbullying is essential for protecting both psychological well-being and academic performance. The motivation of this cyberbullying, the reactions when exposed to the behavior, and the risk factors should be determined to reduce this behavior. In addition, most of the previous studies focused on the prevalence and types of cyberbullying, and the limited number of studies that systematically examined risk factors for cyberbullying and the effect of cultural factors on cyberbullying (e.g., Zhou et al., 2013) formed the motivation for the current study.

On the other hand, gifted students may differ from their peers socially, emotionally, and cognitively and may show unequal development in the early stages of development. This differentiation may also cause differentiation in students' problematic technology use and technology behaviors (Yildiz Durak et al., 2022). In the context of the risk factors of cyberbullying, it is unclear what this differentiation is. The motivation for cyberbullying behaviors, determination of responses, gender (Zhou et al., 2013), and parent and teacher supervision (Atman-Uslu & Yildiz-Durak, 2022; Zhou et al., 2013) are crucial to reduce students' participation in cyberbullying. Academic success is related to various aspects of cyberbullying. While successful students become the target of bullying behaviors, cyberbullying can negatively affect students' academic success and skills (e.g., Shariff & Hoff, 2007). In addition, cyberbullying is a condition that affects the psychological well-being of victims and bully students, and cyberbullying is associated with poor mental well-being (Nixon, 2014).

## Research Questions (RQ)

This study sought to explore the motivation of cyberbullying behaviors, their reactions to these behaviors, and the predictors of cyberbullying sensibility in gifted and non-gifted students. For this purpose, the following research questions were answered.

- RQ1. What are the causes of cyberbullying behaviors in non-gifted and gifted students, and how do they react to cyberbullying?
- RQ2. Do various characteristics of non-gifted and gifted students differ significantly?
- RQ3. Do various characteristics of non-gifted and gifted students predict their cyberbullying sensibility?
- RQ4. Is the model that predicts the non-gifted students' cyberbullying sensibility different from the model that predicts the gifted students' cyberbullying sensibility?

## Conceptual and theoretical framework

### Theoretical framework

General strain theory (GST) suggests that crime results from an individual's inability to achieve success or goals that are valuable to him/her (Agnew, 1992; Merton, 1938). Agnew (1992) states that there are three main sources of tension. These are failure to achieve goals of positive value, loss of positive value stimuli, and negative stimuli (e.g., bullying victimization or emotional abuse). GST defines tensions as objective, subjective, experienced, representational, and expected. The tension experienced by the individual directly influences his/her offending actions, and this type of tension causes individuals to experience negative emotions (such as anger or anxiety). GST states that experiencing tension creates the need for restorative action, which leads to negative emotions (Lianos & McGrath, 2018). Thus, it can be said that individuals who experience tension exhibit cyberbullying as a restorative action.

Paez (2018) examined the relationship between traditional bullying and cyberbullying in the context of GST and emphasized that cyberbullying can be examined as a source of tension as well as a result of tension. Patchin and Hinduja (2011) examined the relationship between tension-based factors (e.g., getting bad grades, negative psychological experiences, etc.) and participation in cyberbullying. In this context, in this study, academic success and psychological well-being variables were considered among the causes of cyberbullying. These variables are triggers of cyberbullying according to GST under unfavorable conditions. On the

other hand, regulation of emotional skills, parental supervision, and educator monitoring were included in the study. According to Gottfredson and Hirschi (1990), antisocial behaviors are exhibited more frequently by individuals with low self-control. It can be said that individuals with low self-control will not have stable emotion regulation skills. Behaviors such as impulsivity, need for immediate gratification, preference for risky activities, quick anger, and getting carried away in the context of low emotional regulation skills may lead to cyberbullying.

### Causes of cyberbullying behaviors, reactions, and cyberbullying sensibility

While information and communication technologies provide various benefits, they can also cause various negative effects, such as cyberbullying, which causes mental, social, and economic problems in the individual (Jun, 2020). Cyberbullying is defined as repeated unwanted, hurtful, harassing, and/or threatening interactions through electronic communication tools (Rafferty & Ven, 2014). With the increasing use of technology, cyberbullying, in which individuals can harass others online 24 h a day, seven days a week via emails, text messages, and social media websites, has become a disturbing trend worldwide (Watts et al., 2017).

When the literature is examined, the causes of cyberbullying are quite extensive. Rafferty and Ven (2014) noted the causes of cyberbullying to be trolling (entertainment), power struggles, and cyber sanction, and they explained these concepts as follows: Cyber sanction is the pressure exerted by one's peers to change their behavior. Power struggles are attempts to hurt, humiliate, or influence another individual's behavior to gain or regain access to a valuable resource. Trolling is an attempt to hurt, humiliate, anger, or provoke an emotional response for one's pleasure (Rafferty & Ven, 2014). Watts et al. (2017) discussed the factors contributing to cyberbullying in higher education under the headings of anonymity, psychological needs, social dominance theory, weak interpersonal child/adult relationships, and other social cues. Jun (2020) concluded that the reasons for cyberbullying are mostly retaliation, anger, and dislike. Cotler et al. (2017) remarked that the causes of cyberbullying in online gaming environments are anonymity, not seeing the effects of cyberbullies' behavior in real life, and not having a fear of punishment.

Being exposed to cyberbullying can lead to various reactions in individuals. Traditional forms of bullying victims often leave home, school, work, etc. can lead to negative consequences when they leave their situation (Watts et al., 2017). Cao et al. (2020) demonstrated that individuals experience distress and exhaustion caused by cyberbullying and

social overload when using social networking sites. In this case, they increase their intention to leave social networks. Evangelio et al. (2022) revealed that being exposed to bullying or experiencing cyber victimization has psycho-social effects on students, such as depression and anxiety.

In the past, bullying generally affected victims in the context of face-to-face interaction in social institutions, but today, with the rapid spread of technology, it is possible for bullies to victimize their targets at all hours of the day and without the need for face-to-face interaction (Rafferty & Ven, 2014). To detect and prevent cyberbullying, there is a need to raise awareness about the effects of cyberbullying and to create educational opportunities to serve multiple audiences (teachers, teacher trainers, school administrators, school counselors, mental health professionals, students, parents, etc.). Ensuring individuals' sensibility in this context to avoid being exposed to cyberbullying can be considered a remarkable factor (Gündüz et al., 2021).

Cyberbullying sensibility is a concept that attracts attention to the prevention of cyberbullying (Arıcağ et al., 2020). Increasing the cyberbullying sensibility that students develop to protect themselves from cyberbullying is important in preventing bullying behavior (Yildiz Durak & Avcı, 2023). According to Tanrikulu et al. (2013), cyberbullying sensibility is the behavior of staying away from behaviors that may lead to bullying behavior while using cyber tools such as the Internet and mobile phones, being aware of the existence of such threats and taking precautions and keeping high attention to notice stimuli that may pose a threat. Cyberbullying sensibility is used in this sense in this article.

### Regulation of emotions

Regulation of emotions indicates when individuals have which emotions and how they experience and express them (Gross, 1998). Regulation of emotions focuses on people's attempts to influence emotions, defined as time-limited, situational, and valuable (positive or negative) states (McRae & Gross, 2020). Emotion-regulating processes can be automatic or controlled, conscious or unconscious, and their effects can be at one or more points in the emotion-producing process (Gross, 1998). Emotion regulation difficulties could affect a student's participation and social relationships with teachers and peers (Neve et al., 2023). Regulation of emotions is necessary because students seek emotional energy, group membership, and interaction rituals that create solidarity to continue instead of abandoning the learning activity in the face of negative situations such as frustration, anger, boredom, and shame. Children's emotional regulation is also affected by how emotions are expressed at home and in bilateral relationships (Morris et al., 2017). Emotion management should also be linked to

inter-strategic variability, which includes the selective use of different strategies in each situation (Double et al., 2022).

### Psychological well-being

Well-being means ideal psychological experience and functionality (Deci & Ryan, 2008). Critical dimensions of well-being are self-acceptance, positive relationships with others, autonomy, environmental mastery, life purpose, and personal growth (Ryff, 1995). The highest level of well-being of someone has been seen as the highest level of happiness for the individual (Deci & Ryan, 2008). Diener et al. (2009) reported that people's positive thinking habits are not the only determinant of happiness and that conditions can also affect well-being, and the tendency to think positively or negatively can affect a person's feelings of well-being by controlling environmental conditions.

Psychological well-being is among the important concepts in positive mental health or positive psychology (Klainin-Yobas et al., 2020). Psychological well-being is a significant condition in students' school and social life. Psychological well-being may improve psychological conditions by increasing the individual's self-knowledge and capacity (Multisari et al., 2022). It is seen as the result of a well-lived life and is an important factor in students' successful adaptation to school life (Morales-Rodríguez et al., 2020).

### The role of age, gender, and educational level on cyberbullying sensibility

When the literature on cyberbullying sensibility is examined, different results are obtained. According to Kırcalıoğlu and Orhon (2022), gender, family income, and family support were predictive factors for cyberbullying sensibility. Studies are showing that girls are significantly more cyberbullying sensibility than boys (Hendekçi & Kadiroğlu, 2020; Kırcalıoğlu & Orhon, 2022). Yildirim et al. (2019) discovered a significant difference in cyber sensibility according to marital status, age, and education level, but they did not find a significant difference according to gender. Kusumawaty et al. (2021) concluded that gender mostly followed the parent profession in shaping cyberbullying behavior. However, they did not find age and education level to be associated with cyberbullying behavior. Walker (2014) found that men are exposed to cyberbullying more than women and that there is no difference between women and men in terms of feeling the need to be dominant through cyberbullying. According to Gündüz et al. (2021), the average participation in cyberbullying is significantly higher in secondary school girls students than in boys, and the first graders were significantly higher than the second graders of secondary school.

There was no difference according to the education level of their parents. The mean scores of cyberbullying sensibility of the girls are higher than boys, and secondary school second graders are significantly higher than secondary school first graders. There is a significant difference in terms of mothers' education level; those with a bachelor's degree and above are the highest, and illiterate students are the lowest. As a significant difference, the level of undergraduate and higher education is at the highest level, and those with secondary school graduates are at the lowest level.

### Perception of success and the role of Grade Point Average (GPA) on cyberbullying sensibility

One of the topics included in studies on cyberbullying is understanding the link between academic success and cyberbullying. In this regard, Giumetti et al. (2022) investigated different variables that predict cyberbullying perpetration and cyber victimization. One of the hypotheses of the research is that objective GPA has a negative relationship between cyberbullying and exposure to cyberbullying. As a result of the research, neither cyber victimization nor cyberbullying perpetration was found to be associated with academic success (Giumetti et al., 2022). Wigderson and Lynch (2013) collected data from 388 adolescents and used multiple regression to examine the relationships between different victimization experiences and indicators of emotional well-being and academic success, and cyber-victimization was negatively associated with GPA. Primarily, schools should provide academic and mental health support to students who experience victimization (Wigderson & Lynch, 2013). When academic success is examined regarding cyberbullying sensibility, Akturk (2015) commented that the relationship between academic success and cyberbullying sensibility is positive and that as academic success increases, cyberbullying sensibility increases. Taiariol (2010) examined the relationship between bullying experiences (process, victimization, and witnessing) and school adjustment (GPA and risky school behaviors). Crime, victimization, and witnessing significantly predicted school adjustment. The biggest variance in school adjustment was risky school behavior, with 14% and 17% GPA (Taiariol, 2010). Shamel (2013) emphasized the lack of empirical evidence for the relationship between cyberbullying and academic structures (i.e., grade point average) of student success. As a result, awareness of cyberbullying that emerges with the conscious use of information and communication technologies is an essential step in reducing cyberbullying and preventing the formation of more victims. In this context, the concept of digital literacy or new media literacy can offer a tool to deal with cyberbullying.

## The role of the use of digital technologies on cyberbullying sensibility

Von Marées and Petermann (2012) provided an overview of the current situation regarding the prevalence and forms of cyberbullying and noted that mobile phones (call, text message) and instant messaging applications over the Internet are the most common environments of cyberbullying. According to Özdemir and Akar (2011), there is a positive relationship between the duration of internet use and cyberbullying. The participants whose daily internet usage time exceeded five hours were more cyberbullying than the other groups (Özdemir & Akar, 2011). Internet usage habits, web pages, or social networks accessed on the Internet are factors that may cause exposure to cyberbullying or increase the risk of being victimized. The harmful effects of cyberbullying were more pronounced among young people who frequently use ICT for entertainment purposes than those who use ICT mainly for information. Baştürk et al. (2015) expressed that children should have some skills to become new technology literate in today's digital culture instead of being passive receivers in the face of new communication environments within the scope of combating cyberbullying. Not seeing media literacy as just a technical skill is especially important for cyberbullying, media literacy can offer a tool to deal with cyberbullying (Baştürk Akca et al., 2015). Increasing cyberbullying sensibility causes a decrease in cyberbullying behavior (Peker & Kaşıkçı, 2022). Considering that digital technologies are effective in cyberbullying behaviors, it is important to examine the effect of digital technologies in increasing cyberbullying sensibility.

## The role of teachers' and parents' approach to online activities on cyberbullying sensibility

Adult attitudes are very effective in preventing (or spreading) cyberbullying, and school administrators and teachers must act more sensibly and consciously on this issue to stop or reduce cyberbullying (Baştürk Akca et al., 2015). Gómez-Ortiz et al. (2019) examined the relationship between family and cyberbullying, and lower levels of victimization and aggression in cyberbullying are associated with tolerant democratic or normative democratic styles of the family and higher levels of authoritarian and rigid styles of families. Elsaesser et al. (2017) found that mediation strategies that focus on parental supervision, such as restricting the Internet, are only weakly associated with cyberbullying and the victimization of young people. Additionally, the research underlines that parents cooperating with their adolescents to browse the Internet safely are more likely to protect against cyberbullying. Adults have an important role in combating cyberbullying. Adults' attitudes towards young people

regarding online activities affect the fight against cyberbullying. Thus, examining the effect of teachers and parents on increasing sensibility to cyberbullying is essential.

## The role of psychological well-being on sensibility to cyberbullying

The concept of psychological well-being, which is expressed as maintaining meaningful goals in life, personal development, and establishing quality relationships, is a combination of theories examining the characteristics of a positively functioning individual and contains important findings that can create many positive results for the individual (Keyes et al., 2002; Yildiz Durak & Avcı, 2023; Yildiz Durak et al., 2023). Cyberbullying is increasing among young people through online social interaction (Rosa et al., 2019). This situation may affect the well-being of students (Nixon, 2014). The effects of cyberbullying on students' well-being may be effective in situations such as increased neuroticism in students with different education levels, depression, suicide, and lack of career goal orientation for the future (Evangolio et al., 2022). Due to these negative effects, it is significant to explore the relationships between cyberbullying and psychological well-being in different contexts.

## The role of regulation of emotions on cyberbullying sensibility

Regulation of emotions is a process used to monitor, evaluate, and change intense and temporary emotional reactions to achieve goals (Thompson, 1994). People actively try to control their emotional states as part of this regulating process (Koole, 2010). Emotion regulation issues can be caused by emotional anxiety, difficulty controlling one's impulses, difficulty regulating one's emotions, acceptance of one's emotional reactions, and difficulty regulating one's emotions (Gratz & Roemer, 2004). Emotional competencies have the potential to affect the development of bullying behavior (Kokkinos & Kipritsi, 2012). However, there is insufficient evidence about this effect (Beltrán-Catalán et al., 2018). Emotional regulation is an important variable for educational environments and is important for a harmonious school environment (Schoeps et al., 2018). Students who can be more aware of their own emotions, express their emotions correctly, and regulate emotional reactions effectively show more positive social support and maintain healthy social relationships. According to Brackett et al. (2011), the regulation of emotional skills effectively manages emotional conflicts by successfully perceiving disturbing moods. Gökçearslan et al. (2023) revealed that emotional regulation difficulties were associated with higher smartphone addiction. Based on this, emotional regulation skills

seem important for problematic technology use. Therefore, the regulation of emotions has a key role in cyberbullying.

### Differentiation of gifted and non-gifted students

Although intelligence tests demonstrate an individual's giftedness, gifted individuals differ from other individuals in some characteristics, and many studies focus on this difference. Matrić and Duh (2015) compared the creativity levels of gifted and non-gifted individuals and found that gifted students were more successful in the test and in most of the individual items in the test. When gifted and non-gifted individuals were compared in terms of cognitive performance, a significant difference was found in favor of gifted students (Rocha et al., 2020). In terms of emotional intelligence, gifted individuals outperformed non-gifted individuals, and gifted females significantly surpassed gifted males (Abdulla Alabbasi et al., 2021). Few studies have examined gifted students and bullying (Smith et al., 2012; González-Cabrera et al., 2019; Sureda Garcia, 2020). Gifted individuals experience more cyber victimization and show less cyberbullying compared to the general population.

### Method

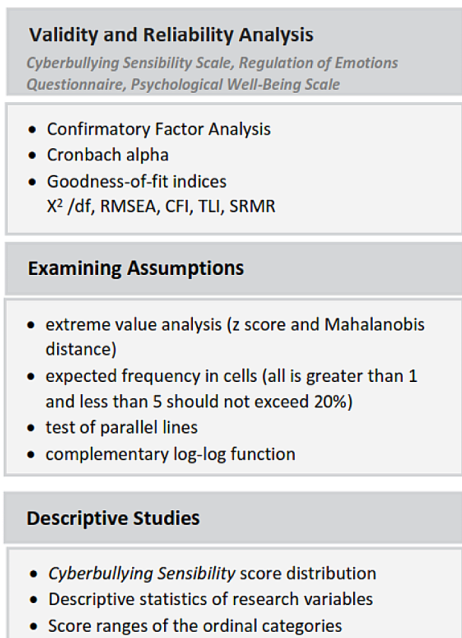
This study is a correlational-predictive research study. It aimed to analyze the predictive relationships regarding cyberbullying sensibility, which is the main variable of the research.

Figure 1 briefly summarizes the research process. In the process, which was designed in two stages pre-analysis and analysis, students' duration of using digital technologies, age of starting to use digital technologies, level of use, academic achievement (GPA), demographic characteristics such as age, gender, education level, psychological well-being and environmental factors (teacher and parental approaches) were included. In addition, a comprehensive Structural Equation Modelling (SEM) framework was established to analyze the relationships between cyberbullying sensibility, emotional regulation, and psychological well-being.

### Study group

The study group consists of 258 participants in total. The proportions of male and female participants in the group are almost equal. 40.7% of them attend secondary school, and 59.3% of them attend high school. About 40% are gifted and 60% are non-gifted. Participation in the research was voluntary.

#### PRE-ANALYSIS PROCESS



#### ANALYSIS PROCESS

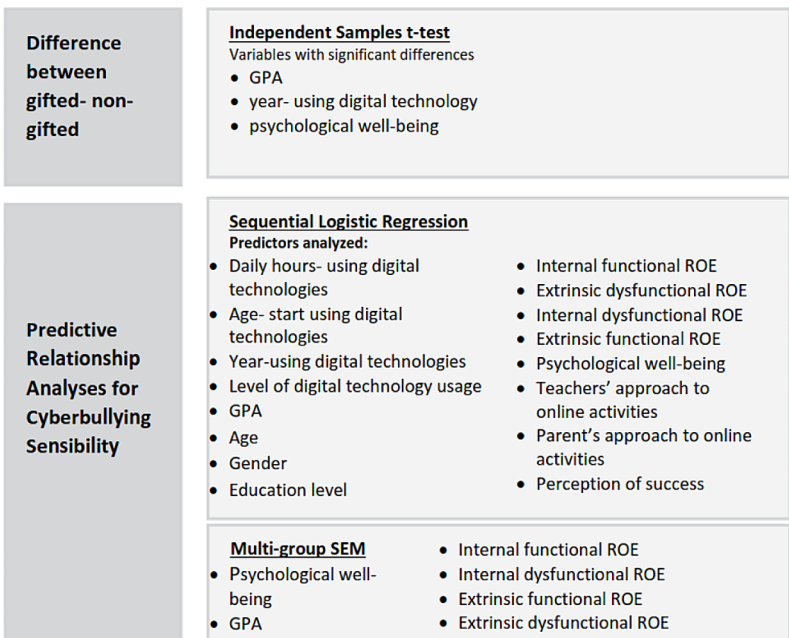


Fig. 1 The research process

## Identification of gifted students

The gifted students participating in this study are among the students recognized by the Ministry of National Education, considering the country's norms. Science and Arts Centers (SAC) were established in Turkey to support gifted students with visual, music, and cognitive abilities. The gifted participants in this study were students who were diagnosed for SAC programs in cognitive ability.

The diagnosis of gifted students for SAC has three stages (Ministry of National Education, 2018). At first, students who are considered to be talented in cognitive ability, visual arts, and musical talent areas are guided and nominated through a form by the classroom teacher in his/her school where he receives formal education. In the second stage, group screening is carried out centrally for these students. As a last step, students who showed higher performance in group screening than the standardized scores determined by the Ministry are defined, and psychometric and technical tools individually evaluate these students. According to the results of individual assessments, outstanding students are entitled to become SAC students. Entitling as a SAC student has some advantages over peers, such as benefiting from support education classes that are located in their own schools.

## Data collection tools and data collection

The research data were collected through the online data collection tool applied to the students. Graded questions examining demographic information (age, gender), educational information (education level, grade point average, perception of success), levels of using digital technologies, and some measurement tools for the research were applied in the form.

### Measurement tools

**Cyberbullying sensibility scale** The scale developed by Tanrikulu et al. (2013) for secondary school students is three-pointed and has 13 items. Exploratory factor analysis was performed to examine the construct validity of the scale, and a structure that explained 46.65% of the total variance emerged. Confirmatory factor analysis was performed for this resulting structure and the fit values confirmed the model ( $\chi^2/sd=3.220$ ,  $RMSEA=0.082$ ). The internal consistency coefficients of the scale were between 0.83 and 0.90, and the two-half-test reliability coefficients

were between 0.75 and 0.84. There is no reverse-scored item in the scale.

**Regulation of Emotions Questionnaire (REQ)** The scale, adapted to Turkish by Duy and Yildiz (2014), was developed by Phillips and Power (2007) to determine adolescents' regulation of emotional skills. The tool, which consists of 18 items, consists of 5-point Likert-type items. The scale consists of four sub-dimensions: Internal functional regulation of emotional skill, internal dysfunctional regulation of emotional skill, external functional regulation of emotional skill, and external dysfunctional regulation of emotional skill. Each dimension is scored and interpreted within itself, not the total score.

**Psychological well-being scale** The psychological well-being scale developed by Diener et al. (2009) was adapted into Turkish by Telef (2013) by making a trial application with university students. It is a one-dimensional scale of a 7-point Likert type. The 8-item scale includes eight basic features of psychological well-being. As a result of the exploratory factor analysis resulted in a one-dimensional structure that explained 42% of the total variance. Cronbach's alpha coefficient was 0.80, and test-retest reliability was found to be 0.86.

## Validity and reliability results

Confirmatory Factor Analysis was conducted to examine the suitability of the three measurement tools considered within the scope of the research to measure the same construct in the study group. In addition, Cronbach alpha reliability indices were obtained. The results are summarized in Appendix Table A. According to Appendix Table A, each scale fits perfectly according to at least two goodness-of-fit indices. An  $X^2/df$  value less than or equal to 2.5 is considered a perfect fit. RMSEA and SRMR values below 0.05 indicate a perfect fit (Jöreskog & Sörbom, 1993). Between 0.08 and 0.05 of these values is considered good (Jöreskog & Sörbom, 1993). CFI and TLI values above 0.95 are considered a perfect fit. There are values above this limit for all four measurement tools. According to the Cronbach alpha internal consistency coefficients, values above 0.70 are considered good, and above 0.90 are interpreted as high internal consistency. According to the findings, the validity and reliability of the scales for the study group are good or excellent.

## Data analysis

The data collection process in this study started with the ethics committee's approval.

Descriptive statistics of the variables examined in the study were examined for gifted and non-gifted students. To observe whether there is a difference between gifted students and non-gifted students in terms of the variables considered within the scope of the research, an independent samples t-test was conducted. In addition, a sequential logistic regression analysis was conducted to examine the factors that predicted the sensibility of both groups to cyberbullying. The predictive relationship between psychological variables and cyberbullying sensibility is also examined with multi-group SEM. The independent variables considered in SEM are ones that have an interval scale and satisfy SEM assumptions. Therefore, the model examined the predictive ability of psychological well-being, emotion regulation skills and GPA on cyberbullying sensibility for both groups. Since measurement models were examined with CFA, findings are focused on the structural model.

The score distribution, descriptive statistics, and score ranges of the ordinal categories, which is the predicted variable in the study of sensibility to cyberbullying, obtained from the whole study group are presented in Figure A.

When Figure A is examined, the scores of the cyberbullying sensibility scale show a left-skewed distribution. This situation shows that students' sensibility to cyberbullying is high in general. The ordinal logistic regression analysis was divided into three ordinal categories according to the scores of cyberbullying as the dependent variable. In converting the scale scores to the ordinal scale, groups were formed one standard deviation behind and ahead of the mean, based on the mean and standard deviation scores.

## Logistic regression analysis assumptions

Regression techniques emerge as superior techniques in determining the effects of the predictor variables on the predicted variable and the relationship between these variables.

**Table 1** Causes of cyberbullying behaviors

	Gifted		Non-gifted	
	Mean	Std. Deviation	Mean	Std. Deviation
Disliking someone	3.63	1.250	3.65	1.400
For fun	3.32	1.336	3.01	1.481
Boredom	2.87	1.433	2.97	1.528
Taking revenge	4.03	1.067	3.83	1.330
To fit/adapt	2.70	1.399	2.44	1.387
Attracting someone's attention	3.16	1.454	3.10	1.460
Looking cool	3.44	1.466	3.42	1.557
Getting another benefit	3.44	1.339	3.26	1.459

Ordinal logistic regression analysis is the only alternative technique that gives meaningful results in studies where the predicted variable is observed sequentially. It is especially preferred because there is no requirement for all predicted variables to be continuous or categorical. There are four basic assumptions in the ordinal logistic regression model. It is necessary for the analysis to ensure that the number of individuals in the categories exceeds a certain lower limit, that there are no extreme values, and that each category of the predicted variable is parallel to the others.

In the first application of the data collection tool, data were collected from 267 people. When the z standard scores of the scale item scores in the study were examined, there were four univariate extreme values. When the Mahalanobis distances were calculated, five multivariate outliers were identified. When the data was cleared from the extreme value, data from 258 people were obtained. Another analysis requirement is that for all pairs of categorical variables, the expected frequency in all cells should be greater than one and the number of pores with an expected frequency less than 5 should not exceed 20% (Tabachnick & Fidell, 2001). For category 3, the "perception of academic success" and "level of use of digital technologies" were combined. These variables consist of two levels: low and high. Finally, the  $\chi^2$  based on the log-likelihood value of the models shows that parallel line assumption is provided ( $\chi^2_{gifted}(17) = 5.116, p > 0.05$ ;  $\chi^2_{non-gifted}(17) = 13.218, p > 0.05$ ).

There are various link functions in structuring the ordinal logistic regression model. If there is a sudden increase in the cumulative probability value towards higher categories of the predicted variable, the complementary log-log link function is exhibited as a good option. The distribution of cyberbullying sensibility in categories for both groups is presented in the graphs in Figure B. The complementary log-log function was preferred in the study since the distribution includes sudden changes.

## Findings

### Descriptive statistics

Participants were asked about the reasons for their cyberbullying behaviors and what their reactions were when they were exposed to cyberbullying by offering various options on a 5-point scale. Descriptive statistics regarding the answers given by the participants are presented in Tables 1 and 2.

According to Table 1, taking revenge stands out among the reasons for the cyberbullying behaviors of the participants ( $\bar{X} = 4.03, SS = 1.067$ ). The reason that follows it is that it does not like someone ( $\bar{X} = 3.63, SS = 1.25$ ). For

**Table 2** Reactions to cyberbullying

	Gifted		non-gifted	
	Mean	Std. Dev	Mean	Std. Dev
Ignoring/not responding	2.70	1.540	2.43	1.611
Deleting shares or files that could harm me	4.06	1.241	4.03	1.280
Changing your online account	3.43	1.375	3.47	1.457
Taking revenge on people who hurt me online	2.18	1.316	2.10	1.348
Talking to someone (parent) about the experience for help	3.50	1.553	3.67	1.579
Talking to someone (brother/sister) about the experience for help	3.18	1.531	3.55	1.546
Talking to someone (teacher) about the experience for help	3.10	1.614	3.23	1.661
Talking to someone (classmates/friends) about the experience for help	3.15	1.438	3.50	1.496

those whose average is above 3.00 for other reasons, looking cool is getting another benefit, having fun, and getting someone’s attention. Boredom and adaptation, which are other options, are not seen as a cause of cyberbullying by the participants.

According to Table 2, they prefer to react when they are exposed to cyberbullying by deleting the posts that harm them ( $\bar{X}$  = 4.06,  $SS$  = 1.4) and, in the second place, by talking to someone about the experience for help ( $\bar{X}$  = 3.50,  $SS$  = 1.55). The lowest choices are revenge ( $\bar{X}$  = 2.18,  $SS$  = 1.31) and ignoring ( $\bar{X}$  = 2.70,  $SS$  = 1.54). All other responses have a mean value above 3.

The descriptive statistics of the ordinal or evenly spaced variables considered within the scope of the research according to gifted students and non-gifted students are presented in Appendix Table B.

According to Appendix Table B, whether the difference between individuals with special needs and some variables is statistically significant or not was examined with the independent samples t-test. The GPA of gifted and non-gifted students ( $t[256] = 2.363, p < 0.05$ ), the age at which they started using digital technologies for the first time ( $t[256] = 8.908, p < 0.01$ ), and psychological well-being scale scores were significant ( $t[256] = -3.647, p < 0.01$ ). Accordingly, gifted students have higher GPAs, they started using digital technology at an earlier age, and their psychological well-being levels are higher.

**Logistic regression models for cyberbullying sensibility**

Predictors of cyberbullying sensibility were analyzed separately based on gifted students and non-gifted students. The results are presented in Table 3 and Appendix Table C.

According to Table 3, grade point average ( $\beta = 0.099$ , Wald  $\chi^2(1) = 9.227, p < 0.01$ ), intrinsic functional regulation of emotions ability ( $\beta = 0.220$ , Wald  $\chi^2(1) = 11,509, p < 0.01$ ) and gender ( $\beta = 1.040$ , Wald  $\chi^2(1) = 4.291, p < 0.05$ ) significantly predicted to cyberbullying sensibility for students with special needs. Accordingly, female and gifted students with high internal functional regulation of emotional skills have more cyberbullying sensibility. This

**Table 3** Ordinal logistic regression analysis results of gifted students

Variables	B	Std. Error	Wald	df	Sig	Exp(B)	95% CI for Exp(B)	
							Lower	Upper
Cyberbullying sensibility [1,00]	13.870	4.811	8.313	1	0.004			
Cyberbullying sensibility [2,00]	16.219	4.887	11.013	1	0.001			
Daily hours of using digital technologies	-0.005	0.106	0.003	1	0.960	0.995	0.808	1.224
Digital technology usage age	0.090	0.130	0.479	1	0.489	1.094	0.848	1.410
Teachers’ approach to online activities	0.106	0.302	0.122	1	0.727	1.111	0.615	2.010
Parent’s approach to online activities	-0.304	0.281	1.167	1	0.280	0.738	0.425	1.281
Year of using digital technologies	-0.051	0.126	0.161	1	0.688	0.951	0.743	1.217
GPA	0.095	0.032	9.116	1	0.003**	1.100	1.034	1.170
Age	0.179	0.243	0.545	1	0.460	1.196	0.744	1.924
Psychological well-being	0.019	0.023	0.699	1	0.403	1.019	0.975	1.065
Internal functional ROE	0.216	0.065	11.162	1	0.001**	1.241	1.093	1.408
Extrinsic dysfunctional ROE	-0.073	0.047	2.435	1	0.119	0.929	0.848	1.019
Internal dysfunctional ROE	0.033	0.050	0.434	1	0.510	1.034	0.937	1.141
Extrinsic functional ROE	0.092	0.065	1.991	1	0.158	1.096	0.965	1.244
Gender [1-female]	1.064	0.500	4.517	1	0.034*	2.897	1.086	7.725
Education level [1- Secondary school]	1.251	0.908	1.898	1	0.168	3.495	0.589	20.727
Perception of success [1-low]	0.473	0.513	0.852	1	0.356	1.605	0.588	4.385
Digital technologies usage [1-low]	-0.213	0.489	0.189	1	0.663	0.808	0.310	2.109

ROE Regulation of emotions, CI Confidence Interval, Reference Category: High cyberbullying sensibility, \* $p < 0.05$ , \*\* $p < 0.01$

-2 Log Likelihood—> Intercept only Model = 158,378, Final Model = 97,159;  $\chi^2(16) = 61.22, p < 0.01$

established model differs significantly from the model in which only the constant is included ( $p < 0.01$ ).

According to odds ratios ( $\text{Exp}[\beta]$ ), a one-unit increase in GPA in gifted students increases cyberbullying sensibility 1,104 times (95%CI, 1.036 to 1.177), and a one-unit increase in internal regulation of emotions skills increases sensibility to cyberbullying 1,246 times (95% CI, 1.097 to 1.415) (over 3 degrees). The student in question is a woman causes an increase of 2.828 times (95%CI, 1.058 to 7.562) in cyberbullying sensibility.

According to Appendix Table C, internal functional regulation of emotions skill ( $\beta = 0.195$ , Wald  $\chi^2(1) = 17.588$ ,  $p < 0.01$ ), external dysfunctional regulation of emotions score ( $\beta = -0.139$ , Wald  $\chi^2(1) = 13,557$ ,  $p < 0.01$ ) and gender ( $\beta = 0.856$ , Wald  $\chi^2(1) = 6,500$ ,  $p < 0.05$ ) significantly predicted vulnerability to cyberbullying for non-gifted students. Thus, students with high internal functional regulation of emotions skills, low external dysfunctional regulation of emotions scores, and female students are more cyberbullying sensibility. The established model differs significantly from the model in which only the constant is included ( $p < 0.01$ ).

According to odds ratios ( $\text{Exp}[\beta]$ ), a one-unit increase in internal regulation of emotions skill increases the cyberbullying sensibility 1.215 times (95% CI, 1.109 to 1.331) (out of a 3-degree). A one-unit increase in external dysfunctional regulation of emotions skill, in which the inverse of this skill is measured, decreases the sensibility to cyberbullying 0.87 times (95% CI, 0.808 to 0.937). The student in question is a girl which causes an increase of 2,354 times (95%CI, 1,219 to 4.546) in sensibility to cyberbullying.

The correct classification rate in the regression models was 80% for gifted students and 68% for non-gifted students. In regression models, the correct classification rate in the model is obtained, and the fact that the rate of correct classification that occurs by chance is 125% or more

is interpreted as a sufficient model that is formed. For the regression model of gifted students, the adequacy criterion was found to be 0.68 according to the random correct classification rate, and the adequacy criterion for the regression model of non-gifted students was 57%. Since the correct classification rate in both models was greater than 125% of the random correct classification rate, the model adequacy was also confirmed by the classification rates. Goodness-of-fit values and Pseudo R<sup>2</sup>s, which are other indicators to evaluate model adequacy, are presented in Appendix Table D.

Pseudo R<sup>2</sup>s represent the amount of variance explained in the variable predicted by the model. A value between 0.20–0.40 is considered high. However, R<sup>2</sup> does not directly reflect the power of the model and is generally interpreted in the comparison of models (Şenel & Alatli, 2014). Accordingly, the model established for gifted students is stronger. In addition, Pearson and Deviance confirm the suitability of the model according to Chi-square statistics ( $p > 0.05$ ).

### Examining predictors with SEM

The predictive relationship between psychological variables and cyberbullying sensibility is also examined with multi-group SEM. Table 4 summarizes SEM results based on the dependent variable: cyberbullying sensibility).

Table 4 indicates that the variables that predict cyberbullying sensibility in both groups for gifted and non-gifted students are the regulation of emotions. Internal functional regulation of emotions and extrinsic dysfunctional regulation of emotions demonstrate predictive relationships for both groups. However, in the gifted student's group, unlike non-gifted students, internal dysfunctional regulation of emotions is also included in the model as a significant predictor ( $p < 0.05$ ). Path diagrams for the two groups are presented in Fig. 1, along with standard estimates.

**Table 4** SEM results based on cyberbullying sensibility

Group	Predictor	Estimate	SE	95% Confidence Intervals		$\beta$	$p$
				Lower	Upper		
Gifted	Psychological well-being	0.0666	0.0404	-0.01248	0.14576	0.1509	0.099
	Internal functional ROE	0.5088	0.1262	0.26138	0.75617	0.3606	<0.001**
	Internal dysfunctional ROE	0.1676	0.0836	0.0038	0.33139	0.1733	0.045*
	Extrinsic functional ROE	0.1014	0.0953	-0.08528	0.28817	0.0856	0.287
	Extrinsic dysfunctional ROE	-0.2985	0.0866	-0.46822	-0.12883	-0.3174	<0.001**
	GPA	0.0937	0.0574	-0.0189	0.20622	0.1264	0.103
Non-gifted	Psychological well-being	-0.0731	0.0415	-0.15437	0.00821	-0.1696	0.078
	Internal functional ROE	0.4087	0.1246	0.16446	0.653	0.2846	0.001**
	Internal dysfunctional ROE	0.0646	0.0902	-0.11226	0.24144	0.0668	0.474
	Extrinsic functional ROE	0.1626	0.0924	-0.01854	0.34373	0.1442	0.079
	Extrinsic dysfunctional ROE	-0.4108	0.0993	-0.60538	-0.21616	-0.3553	<0.001**
	GPA	0.0385	0.032	-0.02424	0.10118	0.0893	0.229

\* $p < 0.05$  \*\* $p < 0.01$

As Fig. 2 clarifies, the standard estimates are very close to each other in both groups: remarkably for extrinsic dysfunctional regulation of emotions ( $\beta_{\text{gifted}} = -0.32$ ,  $\beta_{\text{non-gifted}} = -0.36$ ) and internal functional regulation of emotions ( $\beta_{\text{gifted}} = 0.36$ ,  $\beta_{\text{non-gifted}} = 0.28$ ). In the model for the gifted group, the Internal dysfunctional regulation of emotions was also found to be significant, but the predictive relationship was observed to be low ( $\beta_{\text{gifted}} = 0.17$ ).

### Discussion

As a result of the research, the most important reason for students' cyberbullying behaviors was to take revenge, and the least important reason was to adapt. When the research results in the literature were examined, Rafferty and Ven (2014) found the causes of cyberbullying to be trolling (entertainment), power struggles, and cyber sanctions. Watts et al. (2017) discussed anonymity, psychological needs, social dominance theory, weak interpersonal child/adult relationships, and other social cues. Jun (2020), on the other hand, concluded that the reasons for cyberbullying are mostly retaliation, being angry, and dislike. According to Cotler et al. (2017), the reasons for cyberbullying are anonymity, not seeing the effects of cyberbullies' behavior in real life, and not being afraid of punishment. There are many reasons why individuals engage in cyberbullying

behavior. Although some results are similar to the results in this research, there also appear to be different reasons.

It has been concluded that the most common response to cyber victimization is sharing or deleting files that could cause harm. When the literature is examined, Cao et al. (2020) highlighted that experiencing distress and exhaustion affects the intention to leave social networks. Evangelio et al. (2022) remarked that this situation has psycho-social effects on students, such as depression and anxiety.

When analyzed by gender, gifted and non-gifted female students were found to be more cyberbullying sensibility. When the literature is examined, some studies found that girls are significantly more cyberbullying sensibility than boys, similar to the results of the research (Gündüz et al. 2021; Kırçallıoğlu & Orhon, 2022). According to Yildirim et al. (2019), there was not a significant difference in sensibility to cyberbullying by gender.

Gifted students with high internal functional regulation of emotions skills are more cyberbullying sensibility. Internal functional regulation of emotions skills and external dysfunctional regulation of emotions skills explain sensibility to cyberbullying for non-gifted students. Accordingly, students with high internal functional regulation of emotions skills and low external dysfunctional regulation of emotions scores are more cyberbullying sensibility. Regulation of emotions, which includes the processes used in monitoring, evaluating, and changing emotional reactions and their

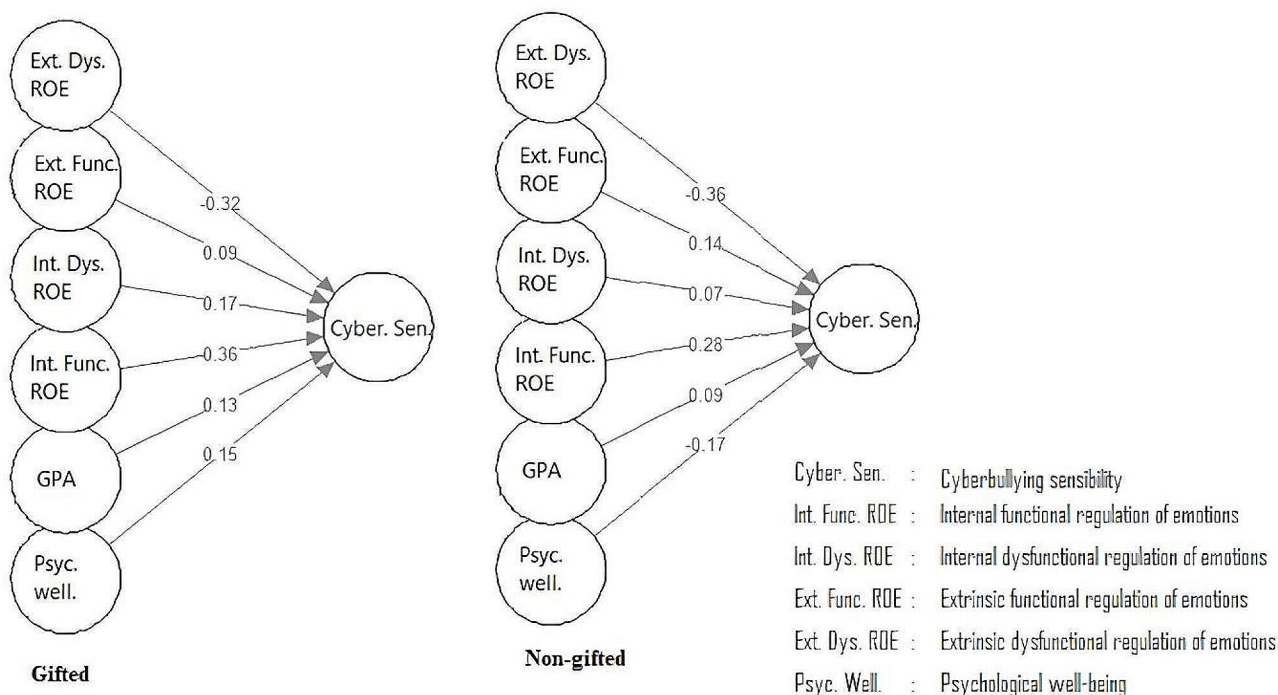


Fig. 2 Path diagram of predictive model of cyberbullying sensibility

active efforts to manage emotional states, has the potential to affect the development of bullying behavior (Kokkinos & Kipritsi, 2012). In this context, especially gifted students are more aware of their own emotions, express their emotions correctly, and can effectively regulate their emotional reactions, increasing their cyberbullying sensibility.

The role of family and teachers in the fight against cyberbullying is important, but the parents' approach to online activities and the teachers' approach to online activities did not have a significant effect on the sensibility to cyberbullying. Although it did not have a significant effect on increasing sensibility to cyberbullying in the current study, the literature also emphasizes the importance of family and teacher attitudes in preventing cyberbullying (Baştürk et al., 2015; Elsaesser et al., 2017; Gómez-Ortiz et al., 2019). This research plays an important role in understanding the impact framework of families and teachers in combating cyberbullying.

According to the current study, there is no significant relationship between the duration of daily use of digital technologies and the age at which they start using digital technologies, and their sensibility to cyberbullying. Positive relationship between the duration of internet use and cyberbullying, and as the duration of internet users increases, the risk of cyberbullying will increase (Vezne et al., 2023). Although there is a significant relationship between cyberbullying and the time of using digital technologies, the age of starting to use digital technologies does not seem to play an important role in increasing or decreasing the sensibility of cyberbullying.

The role of psychological well-being on vulnerability to cyberbullying was not statistically significant. However, when the averages are examined, both the sensibility to cyberbullying and the psychological well-being scores of gifted students were higher than non-gifted students. While Yildiz Durak and Avcı (2023) underlined that cyberbullying is associated with poor mental well-being, Yildiz Durak et al. (2022) pointed out that being gifted in general is a preventive factor in the emergence of problematic internet use behaviors. However, they emphasized that context, age, and gender should be considered. Yildiz Durak et al. (2022) focused on contingencies of self-worth in problematic technology use behaviors such as game addiction of gifted and non-gifted students. In this study, this variable has different effects on gifted and non-gifted students in different dimensions (physical appearance, academic perceptions, etc.).

Within the scope of the research, the predictive relationship between psychological variables and cyberbullying sensibility was examined. As a result, the variable that predicts cyberbullying sensibilities in both groups for gifted and non-gifted students is regulation of emotions. In both groups, internal functional regulation of emotions and

extrinsic dysfunctional regulation of emotions show determining relationships. However, unlike non-gifted students, internal dysfunctional regulation of emotions is also a significant predictor in gifted students. Similarly, Yildiz Durak and Avcı (2023) concluded that psychological well-being significantly influences cyberbullying sensibility. Turliuc et al. (2020) concluded that emotional regulation strategies may have an important role in cyberbullying behavior in their research. Jiang et al. (2022) found that difficulties in emotional regulation were positively associated with cyberbullying. Giumetti et al. (2022) concluded that cyberbullying perpetration or victimization was not related to GPA.

## Limitations and suggestions

There are some limitations in this research. First, it concerns the identification of gifted students. The gifted students participating in this study are among the students recognized by the Ministry of National Education in the country norm. These students are defined as gifted in different areas, such as visual ability, music, and cognitive ability. The gifted participants in this study were students who had been diagnosed with cognitive ability. Therefore, caution should be exercised in the generalization of research findings. In future studies, the same research model can be tested with studies in which talent area is taken into account. The research model can be tested in future studies in environments that represent different contexts. In the study, the factors affecting cyberbullying sensibility differed between gifted and non-gifted students. In future studies, the personal characteristics of gifted and non-gifted students associated with these factors can be investigated.

## Conclusion

This study provides an innovative and advanced contribution to the literature regarding research and application on cyberbullying in the context of its findings. A thorough understanding of the motivation behind bullying and victimization of cyberbullying behaviors for gifted and non-gifted students and identifying responses can help develop purposeful interventions for both victims and bullies. This study emphasized the importance of regulating demographic variables, technology use, psychological well-being, and emotional behaviors to eliminate risk factors.

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**Data availability** The data supporting this study's findings are available from the corresponding author upon request.

## Declarations

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Ethical** Participation was voluntary and anonymous.

**Informed consent** In addition, informed consent was obtained from all participants in this study.

**Conflict of interest** The authors declare that they have no conflict of interest.

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