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Ph.D. THESIS

CYBERVICTIMIZATION IN CHILDREN AND ADOLESCENTS: AN REBT-BASED PERSPECTIVE

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CHAPTER I THEORETICAL BACKGROUND

The online environment plays a significant role in adolescents' social interactions and identity development, with social media serving as a tool for fostering aspirations and maintaining peer connections (Schwartz et al., 2013; Uhls et al., 2017). While the internet offers various positive benefits, it also presents significant negative consequences, such as cyberbullying, which involves hostile or aggressive behavior intended to harm others via digital media (Tokunaga, 2010).

Studies show wide variations in the prevalence of cyberbullying victimization among adolescents, ranging from 1% to over 61%, depending on the context and methodology (Brochado et al., 2017; Zhu et al., 2021). Cyberbullying can involve multiple roles, including victims, perpetrators, bully-victims, and bystanders (Garaigordobil et al., 2014).

In a study by Balas et al. (2023), 42% of Romanian adolescents reported experiencing cybervictimization across various digital platforms. Hasan et al. (2023) reported varying victimization rates across 38 European nations, with Greece at 5.8%, Greenland at 38.3%, and Romania at 22.3%. Comparisons show that Romania has a particularly high level of cybervictimization, as indicated by previous studies (Athanasiou et al., 2018; Tsitsika et al., 2015).

Meta-analyses highlight that adolescents experiencing cybervictimization are more prone to internalizing issues such as anxiety, depression, self-harm, suicidal ideation, as well as externalizing problems like substance use and social difficulties (Fisher et al., 2016). Additional

research suggests that cyberbullying victims also face other mental health challenges, such as low self-esteem, aggression, and loneliness (Kwan et al., 2020).

Cognitively, victims of cyberbullying often struggle with emotion regulation and irrational beliefs (Fallahi et al., 2022), and the role of being a victim is linked to negative self-cognitions and depressive symptoms over time (Cole et al., 2016). Furthermore, core self-evaluation has been found to be negatively correlated with cyberbullying victimization (Peláez-Fernández et al., 2021).

Cyberbullying is a complex and evolving phenomenon that presents challenges for researchers due to the rapid advancement of technology and communication platforms. As new apps and devices emerge, the scope of cyberbullying expands. It can be defined as intentional, repeated harm caused through digital tools (e.g., mobile phones, tablets, social media), with the goal of damaging someone's reputation or well-being. Cyberbullying takes various forms, such as spreading rumors via email or social media, revealing private conversations, using malicious texts, posting inappropriate images or unauthorized photos, or creating fake profiles and websites. It can also involve exploiting personal information to humiliate the victim and infringing on their privacy without consent. This broad definition incorporates multiple forms of harm and emphasizes the damaging intent behind the actions (Chapin & Coleman, 2017; Spears et al., 2011; Tokunaga, 2010; Ybarra & Mitchell, 2004).

Regarding cyberbullying roles, the most common types are perpetrator, victim and bystander. Cyberaggressors are individuals who engage in harmful online behavior. Aftab (2012) categorized aggressors based on motivations, including vengeful angel, power hungry, revenge of the nerds. mean girls and unintentional bully. Cyberbullying is not only a two-way process

between aggressor and victim (Niblack & Hertzog, 2015), but often involves witnesses who can adopt various roles (Allison & Bussey, 2016) such as assistants, promoters, protectors and spectators. Most witnesses remain passive, with studies showing that a significant portion of individuals who witness cyberbullying either ignore or fail to intervene, both online and offline.

Traditional bullying is a deliberate, hostile behavior carried out consistently by a person or group against a vulnerable victim, often due to a power imbalance where the victim lacks the ability to defend themselves (Whitney & Smith, 1993). Key features of bullying include repetition, power imbalance, and intentionality (Olweus, 1994). Bullying is categorized into physical, verbal, and indirect/relational forms, with the latter focusing on damaging the victim's social networks, reputation, or self-esteem (Björkqvist et al., 1982; Crick & Grotpeter, 1995).

Cyberbullying, while similar, differs from traditional bullying in several ways. It occurs through electronic tools, which means the context and location of bullying are much more varied (Smith et al., 2008). Unlike traditional bullying, cyberbullying can be more persistent, as harmful content can reach a wide audience, go viral, and remain online indefinitely, prolonging its impact (Raskauskas, 2010). Victims of cyberbullying may face harassment even outside of school, as harmful messages and images can continue circulating (Campbell, 2011).

In cyberbullying, the power imbalance is less dependent on physical strength and more on technological expertise or the anonymity provided by the internet (Fauman, 2008; Jordan, 1999). The wider reach and lasting nature of online material can make victims feel more affected, and the anonymity may lead aggressors to feel less accountable for their actions (Campbell, 2011; Kwan & Skoric, 2013). The ease of re-sharing material also means that the harm may persist even after the initial act of bullying (Campbell, 2011; Campbell et al.,

2013).Regarding explicative theories of cyberbullying, there are two perspective that are postulated in literature: the Barlett and Gentile Cyberbullying Model (BGCM; Barlett & Gentile, 2012) and the Social-Ecological Model of Cyberbullying (Patel & Quan-Haase, 2022).

Studies show mixed results regarding gender differences in cyberbullying victimization. Some meta-analyses (e.g., Barlett & Coyne, 2014) suggest that girls are more prone to cyberbullying at younger ages due to early social and physical development. Emerging evidence has revealed that many characteristics of cyberbullying—its definition, prevalence rates, risk and protective factors, outcomes, and prevention strategies—are related and yet somewhat unique from traditional bullying. The ubiquity of technology in the lives of youth presents an opportunity for individuals to intentionally and repetitively harm others, 24 h per day, sometimes with complete anonymity, and often without consequence. This is concerning given the high rates of psychopathology associated with cybervictimization, over and above, traditional bullying. At later ages boys are more likely to engage in cyberbullying due to higher technological competence (Huffman et al., 2013). However, other studies (e.g., Sorrentino et al., 2019) found no gender difference in cybervictimization.

The impact of age on cyberbullying victimization also shows varied results. For example, Huang et al., (2019) found that older students were more exposed to cyberbullying, particularly in online gaming contexts. However, other research, such as Baraldsnes (2015) and Morin et al. (2018) indicated that older students, particularly those in high school, were more likely to be cybervictims. In contrast, some studies like Katzer et al. (2009) and (Hinduja & Patchin, 2008) found no significant correlation between age and cyberbullying victimization.

Research has increasingly explored the overlap between traditional bullying and cyberbullying victimization. Early studies by Ybarra & Mitchell (2004) suggested that cyberbullying might be an extension of traditional bullying, with individuals using technology to continue bullying. Hinduja & Patchin (2008) argued that victims of traditional bullying might retaliate through cyberbullying.

Sumter et al. (2012) found a strong correlation between traditional and cyberbullying victimization in a four-wave study. Adolescents who experienced moderate levels of victimization online also tended to face moderate levels offline, supporting the role continuity hypothesis, which suggests that victimization patterns remain consistent across both online and offline settings (Baldry et al., 2016; Raskauskas & Stoltz, 2007). This suggests that online and offline bullying often coexist, with victims typically experiencing both types.

Adolescents with pre-existing mental health issues, like depression, are more susceptible to cyberbullying, creating a self-perpetuating cycle where bullying worsens their psychosocial challenges (Kochel et al., 2012; Reijntjes et al., 2011). A comprehensive map review by (Kwan et al. (2020) confirmed a strong link between cyberbullying victimization and various mental health issues, including depression, anxiety, suicidality, and self-harm, as well as psychosocial problems such as low self-esteem, peer relationship issues, and substance misuse. Cyberbullying victims are three times more likely to experience depression compared to non-victims, with traditional bullying often exacerbating the impact (Tran et al., 2023). Victims are also more prone to suicidal ideation and self-harm (Chang et al., 2019; Islam et al., 2020). Victims are also twice as likely to experience sleep disturbances, possibly due to excessive screen time associated with online activities (Nagata et al., 2023).

REBT posits that severe emotional suffering stems from cognitive processes rather than external events (DiGiuseppe, 1990). It argues that psychological disorders arise from irrational thinking about events, rather than the events themselves. This irrational thinking includes rigid beliefs, such as "musts" or "awfulizing," which are self-destructive and lead to emotional problems (Neenan & Dryden, 1999).

REBT categorizes rational beliefs into four types: non-dogmatic preferences, non-awfulizing views, high frustration tolerance, and self-acceptance beliefs. In contrast, irrational beliefs include demands, awfulizing, low frustration tolerance, and self- or life-depreciation beliefs. Rational beliefs lead to healthy emotional and behavioral outcomes, while irrational beliefs result in dysfunctional emotions and actions (Ellis, 1977).

REBT uses the ABC model to explain how irrational beliefs (B) influence the emotional consequences (C) of an event (A). The model emphasizes that it is not the event itself, but the interpretation of the event that leads to emotional outcomes (Ellis & Grieger, 1986). The theory has expanded the ABC model to include two more components: (D) challenging disruptive beliefs and (E) adopting a rational perspective (Neenan & Dryden, 1999).

Several initiatives aim to reduce cyberbullying perpetration and victimization, considering the significant impact on children's and adolescents' lives. Examples of such programs include: *Cyber Friendly Schools Program* (Cross et al., 2016), *No Trap!* (Palladino et al., 2016) and *Cyberprogram 2.0* (Garaigordobil & Martínez-Valderrey, 2014).

Regarding the limitations in cybervictimization research, we have identified four main caveats in literature. First refers at the lack of meta-analysis on self-related cognitions in

cyberbullying victims. The second cvartet is represented by an absence of a triangular perspective instrument for cybervictimization among Romanian population of adolescents. The second cvartet is represented by the lack of studies on self-acceptance in relation to parental and peer relationships. The final limitation is represented by insufficient longitudinal understanding of irrationality in cybervictimized adolescents.

CHAPTER II. RESEARCH OBJECTIVES AND OVERALL METHODOLOGY

The scope of this thesis was to advance the understanding of the influence of cognitive mechanism such as self-related cognitions and irrational cognitions on cyberbullying

victimization among children and adolescents. In this regard, four major objectives were pursued.

Our first main objective was pursued by conducting a systematic review and meta-analysis that analyze the association between self-related cognitions and cybervictimization in children and adolescents **(Study 1)**. Our general objectives regarding this study were to analyze if there is an association between self-related cognitions and cybervictimization in children and adolescents; if there are particular self-related cognitions that exhibit stronger associations with cyberbullying victimization and if there are moderators such as age, gender or country that influence the relationship between self-related cognitions and cybervictimization. This review included cross-sectional and the first wave of data colection in longitudinal studies that analyzed the association between one or more self-related cognition and cybervictimization among children and adolescents. Studies that did not include participants up to 18 years old or that did not assess the association between at least one self-related cognition and cybervictimization or that did not provided sufficient information regarding the aforementioned association have not been included in this study. We further investigated each instrument to get a comprehensive understanding of the validity of the measurements.

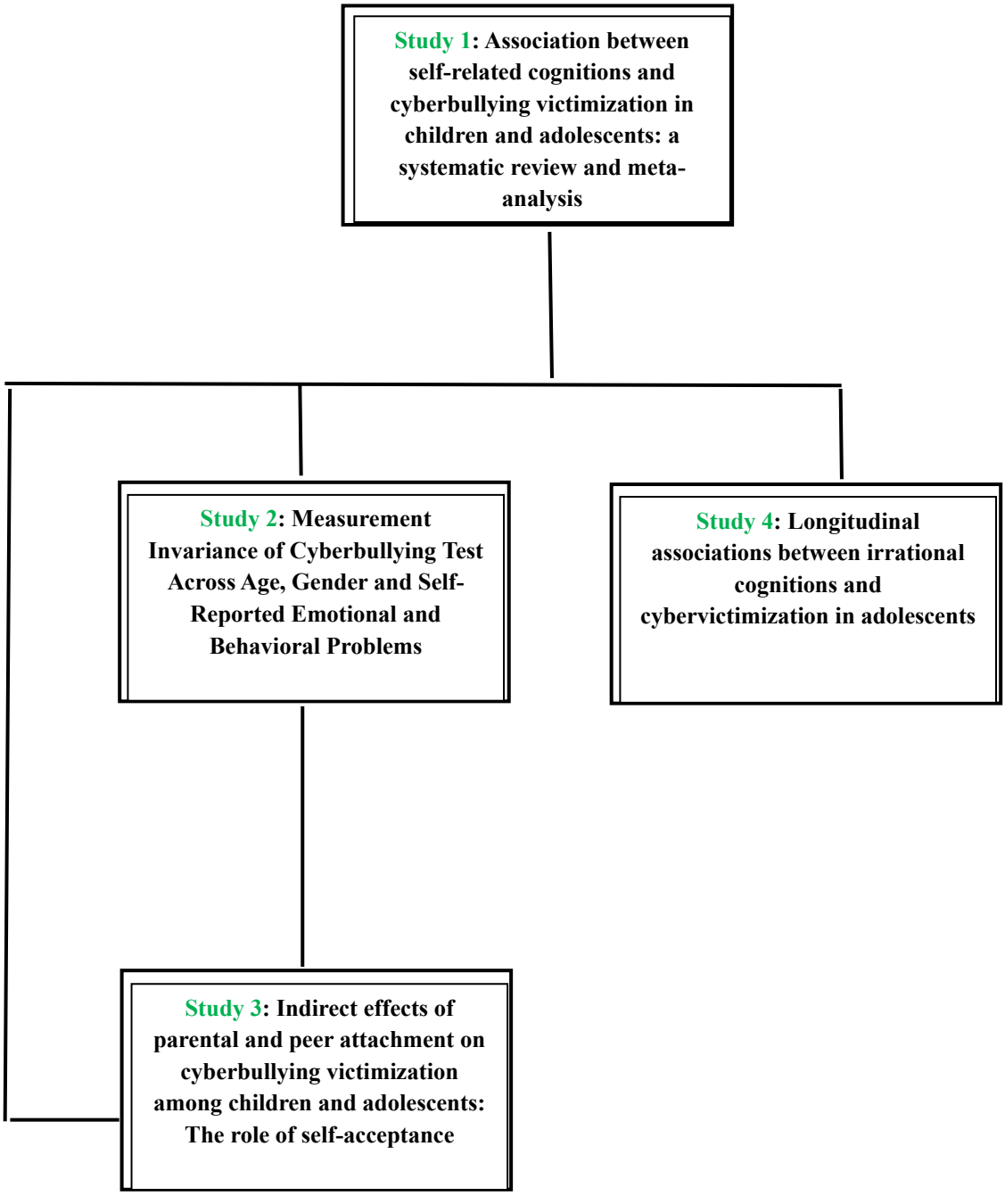
Our second objective was to investigate the psychometric properties of Cyberbullying Test (**Study 2**). In this regard we examined the factor structure via Confirmatory Factor Analysis and the measurement invariance through child global report – across age, gender and self-report level of mental health problems (emotional and behavioral problems) of children and adolescents.

The third objective was to investigate the mediation effect of self-acceptance in the association between attachment quality (particularly with parents and peers) and cyberbullying

victimization among adolescents (**Study 3**). We aimed to examine the impact of parental and peer attachment, particularly through the dimensions of alienation, trust, and communication, on the experience of cyberbullying victimization, and if these associations are influenced by self-acceptance. Additionally, we examined the effects of gender and age.

Our last objective was to longitudinally examine the relationship between irrational cognitions and cybervictimization in adolescents (**Study 4**). This study is the first longitudinal investigation assessing the relationship between irrational cognitions and cyberbullying victimization among children and adolescents, in order to acquire a thorough understanding of the overall impact of irrational cognitions, as well as the individual effects of each type of irrational cognition. This aim has been accomplished by a three-wave longitudinal research involving a Romanian sample of adolescents. The data was gathered over a six-month period, enabling us to evaluate the influence of the total amount of irrational cognitions, each irrational cognition separately, and the interplay between cognitions and cybervictimization.

Fig. 1 The schematic overview of the studies from the present Ph.D. thesis



III. ORIGINAL RESEARCH

Study 1: Association between self-related cognitions and cyberbullying victimization in children and adolescents: a systematic review and meta-analysis

1. Introduction

Social media plays a crucial role in shaping young people's identities, but it also exposes them to cyberbullying—repeated, intentional online aggression characterized by a power imbalance (Ansary, 2020). Unlike traditional bullying, cyberbullying is often anonymous, persistent, and can happen at any time, making it particularly harmful (Kowalski et al., 2014). Studies indicate that cyberbullying affects between 13.99% and 57.5% of youths, leading to severe emotional consequences such as anxiety, depression, and long-term psychological distress (Davison & Stein, 2014; Holfeld & Mishna, 2018; Y. Hu et al., 2021; Zhu et al., 2021).

Cognitive theories proposed by Ellis (1962, 1977) and Beck (1963, 1964) suggest that negative experiences and irrational beliefs play a crucial role in shaping emotional distress and maladaptive behaviors. Cybervictimization reinforces negative self-perceptions—such as low self-esteem, self-blame, and low self-efficacy—which increase vulnerability to further victimization, creating a harmful cycle (Navarro et al., 2015; Sabanci & Çekiç, 2019). Victims who internalize bullying as a reflection of their identity struggle more than those who perceive it as an external event (Graham & Juvonen, 1998).

According to the cognitive model, cyberbullying triggers negative beliefs about self-worth, leading to emotional distress, including anxiety and depression. This distress often results in withdrawal and avoidance behaviors, reinforcing the victim’s vulnerability. Over time, this cycle of negative self-beliefs and victimization becomes self-sustaining (Ellis & Wilde, 2002;

Rosen et al., 2007). Stress and irrational beliefs can further increase susceptibility to peer victimization, as research has shown a strong link between irrational beliefs and both cyberbullying victimization and perpetration (Bîrle & Boșca, 2013.; Sabancı & Çekiç, 2019). However, there is currently no structured model that systematically examines how different forms of self-related cognitions impact cybervictimization.

This study aims to address this gap by examining the role of self-related cognitions—including self-esteem, self-efficacy, and self-blame—in cybervictimization. The concept of "self" is multidimensional, encompassing not just self-esteem but also self-concept (Purkey, 1988), self-acceptance (Ellis, 1977) or self-compassion (Neff, 2003), all of which are relevant to cyberbullying experiences. Research indicates that victims of both traditional and cyberbullying tend to develop negative self-concepts, which extend to their academic and family environments (Corcoran et al., 2012). Gender differences have been observed, with girls being more affected than boys (Romero-Abrio et al., 2019).

Low self-efficacy has been identified as a key factor in cyberbullying, influencing both victimization and perpetration. In some cases, cyberbullying victims with low self-efficacy later become aggressors (Peker et al., 2021; Wong et al., 2014). Self-blame also plays a significant role, as victims who blame themselves for their bullying experiences tend to experience greater emotional distress, including depression (Raskauskas & Stoltz, 2007; Sheanoda & Bussey, 2021). While studies suggest that these self-related cognitions contribute to cybervictimization, anti-bullying programs often fail to incorporate them due to mixed research findings and a lack of consensus on their overall impact (Ayas, 2016; Hayes et al., 2022).

To develop more effective anti-bullying interventions, it is crucial to understand how self-related cognitions influence cybervictimization across different developmental stages. Identifying key inflection points in the transition from childhood to adolescence could help design targeted interventions. While some research has explored self-efficacy in bullying (Lei et al., 2020), little has been done to examine the full range of self-related cognitions in cybervictimization.

For instance, understanding whether self-related cognitions exert varying effects during the transition from childhood to adolescence, or identifying potential inflection points that could alter the trajectory of becoming a victim or perpetrator of cyberbullying, would provide valuable insights for tailoring effective intervention strategies. Similarly, understanding which self-related cognitions are more likely to impact cybervictimization will offer a better understanding of how we should develop anti-bullying programs. Consequently, building upon existing literature, our study aims are to address this gap and offer a comprehensive and cohesive understanding of the relationship between cybervictimization and self-related cognitions by addressing the following key research questions:

1. To what extent are self-related cognitions related to cyberbullying victimization in children and adolescents?

2. Are there particular self-related cognitions that exhibit stronger associations with cyberbullying victimization?

3. What moderators (e.g., age, gender, country) influence the relationship between self-related cognitions and cybervictimization?

1. Method

2.1 Protocol and registration

This systematic review and meta-analysis were conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(Moher et al., 2009) and the Cochrane Handbook (Higgins & Green, 2011). The study protocol was registered on the International Prospective Register of Systematic Reviews (PROSPERO reference number CRD42021289512).

2.1 Literature search and study selection

We systematically searched PsycINFO, MEDLINE (via PubMed), Scopus, Web of Science Clarivate (via Web of science core Collection), and Cochrane databases from their inception until September 2021 and updated in October 2022. The keywords covered by the search string included terms regarding self-related cognitions (self, self-esteem, self-evaluation, self-attribution, self-efficacy, self-concept, self-compassion, self-acceptance), cyberbullying (cyberbullying, cybervictim, cybervictimization, electronic bullying, online victimization, online bullying) and the population of children and adolescents (adolescent, adolescence, child, childhood, pupil).

Inclusion criteria were grounded on the PICO framework as follows: (1) Participants: children and adolescents up to 18 years old or primary, elementary, and secondary school students; (2) Exposure: at least one self-related cognition (e.g., self-esteem, self-efficacy, self-concept) measured by a validated self-reported questionnaire; (3) Study design: cross-sectional, case-control, or longitudinal and interventional studies (only if baseline/first wave data were

available); (4) Outcome: cyberbullying victimization as assessed by a validated self-reported questionnaire; (5) Language: articles published in English or Spanish

2.3 Data extraction and Coding

Two researchers (F.A, A.C) independently used a standardized spreadsheet to extract the data from all eligible articles. We included in the search string terms such as ”self”, ”cyberbullying” and ”adolescent”. The following data were extracted: author, year of publication, country of study, sample size (with percentage of girls), age of participants, type of self-related cognitions, measures used for self-related cognitions and cybervictimization, recalling time frame of cybervictimization, type of sample, country and data for computing the effect size.

2.4 Methods of data synthesis and analysis

We used the software packages Comprehensive Meta-Analysis (CMA v. 2.2.064) for computing study-level effect estimates and Stata SE 16.0 (STATA Corp., Inc., College Station, TX) packages Meta (Wilson, 2022) for pooling, Metabias (Harbord et al., 2009) for testing small study effects, Hetergi (Orsini et al., 2006) for computing the 95% CIs of heterogeneity index and Confunnel (Palmer et al., 2008) for visualization. We used the Pearson correlation coefficient (r) in conjunction with the sample size (N) of each study as a measure of the pooled effect size (ES).

2.6 Quality assessment of included studies for risk of bias

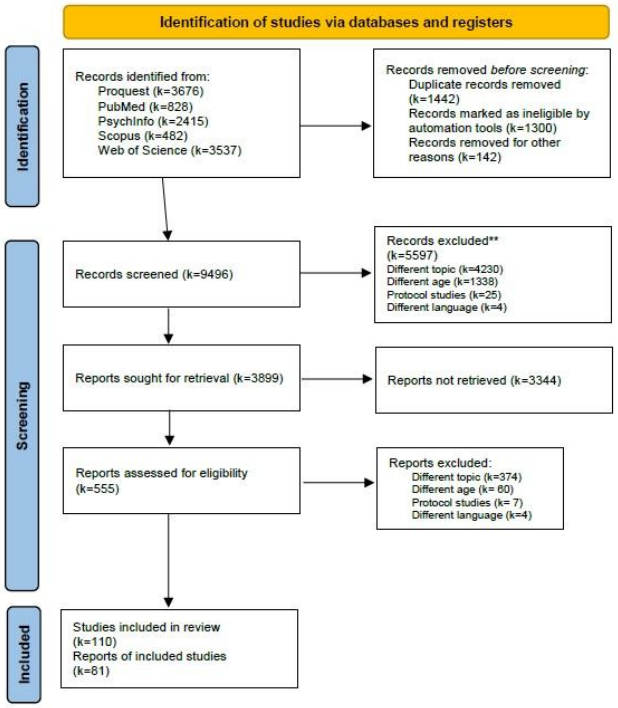
Two independent researchers (F.A., D.C.) assessed the quality of the included studies using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies scale (Nhlbi, 2017).

3 Results

3.1 Selection process and study characteristics

The PRISMA flow diagram summarizing the stages of the selection process is presented in Fig. 1. A total of 10,938 studies were returned from the searches and 9,496 remained following the removal of duplicates. After the title and abstract screening, we assessed the full text of 555 studies against the inclusion and exclusion criteria. A total of 110 articles were eligible after this process.

Figure 1 – *Prisma Diagram*



Among the 81 included studies, 110,095 children and adolescents were included with a mean age of 11.51 years old and a mean percentage of females of 48%. The samples in each study varied from 42 to 7,333, most of them drawn from general populations, with only 3.24% of the studies including special populations.

3.2 Quality assessment of included studies

There was 82% agreement between the two researchers on each of the 14 items of the quality assessment tool. Only 6.17% of the studies were scored to be methodologically high quality. However, 48.13% of the studies were rated to have fair quality and 45.67% were rated to have low quality.

3.3 Meta-analytic effects regarding the association between self-esteem and cybervictimization

Using univariate associations (62 studies, 93,402 participants), self-esteem was negatively associated with cybervictimization with an $r = -0.16$ (95% CI [-0.21; -0.11]) but there was high heterogeneity between studies (I^2 = 98%; 95% CI [97; 98]).

Meta-regression analyses showed that the number of participants significantly moderated the relationship between self-esteem and cybervictimization, with a slope of -0.18, (95% CI [-0.24; -0.11], p <0.001).

3.4 Meta-analytic effects regarding the association between self-efficacy and cybervictimization

The pooled correlation coefficient for self-efficacy and cybervictimization association, based on 11 independent samples (11,490 children and adolescents) denoted an r = -0.19 (95% CI [-0.24; -0.14]) and we observed high heterogeneity across studies (I^2=88%; 95% CI [82; 93]).

3.5 Meta-analytic effects regarding the association between self-concept and cybervictimization (Table 2, Figure 4)

When we considered the studies that examined the association between self-concept and cybervictimization, which involved 4,271 youths, we observed a pooled correlation coefficient r = -0.29 (95% CI [-0.42; -0.16]), paired with a high amount of heterogeneity (I^2=95%; 95% CI [92; 97]).

3.6 Meta-analytic effects regarding the association between self-blame and cybervictimization (Table 2, Figure 5)

When we looked at the six studies concerning self-blame and cybervictimization, involving a total of 3,999 participants, we identified a correlation coefficient of r = 0.15 (95% CI [-0.05; 0.34]) and noted significant heterogeneity (I^2 = 98%; 95% CI [95; 98]).

4. Discussion

A small negative correlation suggests that lower self-esteem increases vulnerability to cyberbullying, though the relationship may be bidirectional (Ayas, 2016a; Egan & Perry, 1989).

A weak negative correlation indicates that victims may struggle with social relationships and coping mechanisms (Navarro et al., 2012; Peker et al., 2021).

A marginal negative correlation suggests cybervictims may have lower self-concept, though results vary (Delgado et al., 2019; Estévez et al., 2020).

No significant link was found, though some studies suggest self-blame may contribute to repeated victimization (Arató et al., 2020).

Existing anti-cyberbullying interventions rarely address self-related cognitions. We propose integrating self-esteem, self-efficacy, and self-concept modules into prevention programs, helping children recognize victimization and develop self-defense strategies.

5. Limitations and future directions

Studies focused only on victims under 18; future research should explore other roles (e.g., bullies, bystanders) and extend to emerging adults. The findings rely on mostly correlational and cross-sectional data, limiting causal interpretations. Sample size significantly influenced results, underscoring the need for larger, more standardized studies. Future interventions should incorporate self-related cognitions to enhance cyberbullying prevention efforts. This study highlights the importance of self-related cognitions in cyberbullying victimization, offering a foundation for future research and intervention development.

Study 2: Measurement Invariance of Cyberbullying Test Across Age, Gender and Self-Reported Emotional and Behavioral Problems

1. Introduction

Cyberbullying represents a deliberate aggressive behavior perpetrated by either an individual or a group through electronic means such instant messaging, online websites (such as social networking websites, video-sharing websites or social gaming sites) or videos, text messages and pictures shared online, persistent and over an extended period of time, which targets a victim who cannot effectively protect themselves (Hinduja & Patchin, 2011; Smith et al., 2008). Cyberbullying involves perpetrators, victims and witnesses (Vismara et al., 2022).

1.1 Gender, age and cyberbullying

There is heterogeneity in the demographics of cyberbullying, specifically in terms of age and gender regarding the cyberbullying roles and efforts have been made to organize and analyze the available data on this topic. A meta-analysis by Sun, Fan, and Du (2016) found that males were more likely to cyberbully than females (Sun et al., 2016). Furthermore, another meta-analysis examining the relationship between cybervictimization and depression revealed that gender acted as a moderator, intensifying the correlation in females (Hu et al., 2021). Younger women appear to be more likely to cyberbully than men. As individuals get older, males become more likely to engage in cyberperpetration than females (Barlett & Coyne, 2014).

1.2 Cyberbullying prevalence in Romania

Upon contrasting the rates of cyberbullying across various European countries, it becomes evident that Romania exhibits a notably high degree of cybervictimization (Athanasiou et al., 2018; Tsitsika et al., 2015). The critical nature of accurately assessing this phenomenon

using complex tools became evident as a result of the considerable incidence of cyberbullying incidents in Romania.

1.3 Cyberbullying assessment

Regarding cyberbullying measurement tools, Chun et al. (2020) analyzed current cyberbullying instruments and included in their systematic review a total of 64 measures. Among the total of 64 instruments that were analyzed, only two of them assessed cyberbullying from a triangular perspective, which incorporated the bystander role in addition to the cybervictim and cyberaggressor roles.

The Cyberbullying Test, developed by Garaigordobil, is an extensive tool for evaluation designed for assessing situations of cyberbullying (Garaigordobil, 2017). The novelty of this instrument consists of a triangular perspective which enables the examination of 15 distinct behavioral categories by gathering three specific types of information about cybervictimization, cyberaggression, and cyberwitness. The triangular perspective offers more versatility in comparison to the two-dimensional approach, which is more restrictive and excludes cyberbystanders (González-Cabrera et al., 2019).

1.4 Psychometric properties of Cyberbullying Test

With regard to the psychometric properties, particularly internal consistency, observed in the study of the Cyberbullying Test's development, the analysis indicated notable Cronbach alpha coefficients for the 45 items (α =.91). More specifically, the subscales of cybervictimization (α = .82), cyberaggression (α = .91), and cyberwitness (α = .87) demonstrated high internal consistency. The fit of the three-factor model was examined with CFA, showing a good statistical fit with CFI = .91 and RMSEA=.056. The fit indices indicated that the model achieved an

adequate level of fit, as evidenced by the NNFI and CFI values which demonstrated that the model fits the data well (Garaigordobil, 2017).

It is currently a lack of investigation in the Romanian population regarding the analysis of the psychometric properties of the Cyberbullying Test, despite its complexity and the inclusion of a triangular perspective in the context of cyberbullying. In addition to the significance of considering the triangular perspective when evaluating cyberbullying, there is also an ongoing discussion about the proper use of multiple-item measurement.

In our study, we divided the participants between preadolescents (those aged ≤13) and adolescents (those aged >13) and we aimed to ascertain whether there are differences between the two groups in terms of age, gender, and self-reported emotional and behavioral problems. Considering these limitations, the present study has examined the factor structure and the measurement invariance of the Cyberbullying Test via Confirmatory Factor Analysis. Measurement invariance was assessed through child global report – across the age, gender and self-report level of mental health problems of children and adolescents.

2. Method

2.1 Participants

The study sample consisted of 767 children and adolescents, with 423 of the participants identified as female and the mean age of 13.4 years old, ranging from 10 to 18 years. Regarding self-reported behavioral and emotional problems, 31% (238 of the respondents) were included in the high level of self-reported behavioral and emotional problems group and the rest in the low level of self-reported behavioral and emotional problems group.

2.2 Instruments

Demographic questionnaire including information about respondent's gender, age, residency, family information (e.g. number of siblings, educational background of the parents).

The Cyberbullying Test (Garaigordobil, 2017) is an instrument aimed to assess adolescents' participation in cyberbullying. It consists of 45 items that assess 15 distinct cyberbullying behaviors. These items are organized based on the specific role played in instances of cyberbullying, namely cybervictim, cyberaggressor, and cyberwitness.

The Strength and Difficulties Questionnaire (SDQ) (Goodman, 1997) is an instrument used to evaluate mental health issues in individuals between the ages of 4 and 17. The instrument consists of a total of 25 items, which are further categorized into 5 subscales: emotional symptoms, conduct difficulties, hyperactivity and peer problems, as well as prosocial behavior.

2.3 Procedure

The present study has received ethical approval from the Ethics Committee of Babes-Bolyai University, and furthermore, informed consent was obtained from schools and parents or legal guardians of the participants. The data was gathered online from children and adolescents during their regular school hours using mobile devices.

2.4 Data Analysis

Confirmatory factor analysis was carried out with the R-package lavaan in R studio (RStudio Team, 2020) and the R-script is available in the electronic supplementary materials (R-script).

We tested the measurement invariance by using multigroup CFA (MGCFA) in two steps following the procedure proposed by Dimitrov (Dimitrov, 2010). In the first step, no equality constraints were imposed (configural model). In the second step, both loadings and thresholds were jointly constrained to be equal across groups (scalar model). To assess measurement invariance, configural and scalar models were compared by computing chi-square and modification in goodness of fit indices (Pendergast et al., 2017).

The fit indices estimated were comparative fit index (CFI; Bentler, 1990), standardized root mean squared residual (SRMR; Jöreskog & Sörbom, 1988) and root mean square error of approximation (RMSEA; Steiger, 1990). Values of CFI ≥.90, SRMR ≤.10 and RMSEA ≤.06 would indicate acceptable model fit (Bentler, 1990; Hu & Bentler, 1999; Petscher et al., 2013).

3. Results

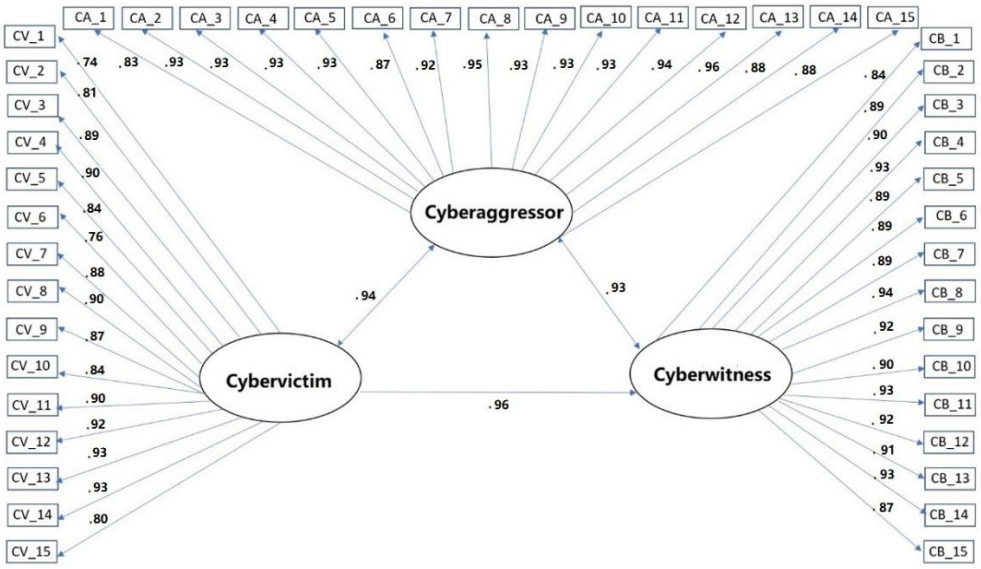
3.1 Missing data

First, we investigated the percent of missing data per each item of Cyberbullying Test as well as for the age and gender of the children (these were the demographic variables considered in the analyses). All the items had a 1.3% of missing values.

3.2 Factor loagings

The standardized loadings of the items varied from .74 to .93 (cyberbullying victimization), .83 to .96 (cyberbullying aggression) and .84 to .94 (cyberbullying witness) (see Figure 1). Interfactor correlations were between .96 (cybervictimization-cyberwitness), .94 (cyberictimization-cyberaggression) and .93 (cyberaggression-cyberwitness). All the information regarding factor loadings can be seen in **Figure 1**.

Figure 1. The Three-Factor Model of Cyberbullying Test



3.3 Measurement invariance

For each group for which measurement invariance was examined across, the fit indices were computed. Regarding measurement invariance across gender, scalar invariance was supported RMSEA = .00, SRMR = .034, and CFI = 1.00 and ΔRMSEA = .00, ΔSRMR = -4.83 and ΔCFI = .00. Regarding invariance of age on the Cyberbullying Test, RMSEA = .00, SRMR = .032 and CFI = 1 and ΔRMSEA = .00, ΔSRMR = -5.71 and ΔCFI = .00. Regarding invariance of self-reported emotional and behavioral problems on the Cyberbullying Test, RMSEA = .00, SRMR = .04 and CFI = 1.00 and ΔRMSEA = .00, ΔSRMR = -1.87 and ΔCFI = .00. Besides the findings regarding configural and scalar invariance on gender, age and self-reported emotional and behavioral problems, all factor loadings were significant ($p < .05$).

Results of Measurement Invariance Using Multigroup Confirmatory Factor Analysis can be seen in **Table 1.**

Table 1. Results of Measurement Invariance Using Multigroup Confirmatory Factor Analysis

	Configural invariance					Scalar invariance									
	Df	χ2	CFI	SRMR	RMSEA	Df	χ2	CFI	SRMR	RMSEA	Δχ2	p-value	ΔCFI	ΔSRMR	ΔRMSEA
Gender	1798	1737.2	1.00	.034	.000	1922	1814.1	1.00	.034	.000	76.931	.999	.00	-.00	.00
Age	1798	1568.0	1.00	.032	.000	1922	1674.6	1.00	.032	.000	106.61	.868	.00	-.00	.00
Level of SR SP	1798	1713.8	1.00	.04	.000	1922	1854.6	1.00	.04	.000	140.78	.144	.00	-.00	.00

Note. df = degree of freedom; χ2 = chi-square; CFI = comparative fit index; SRMR = ; RMSEA = root mean square error of approximation; Δχ2 = chi-square difference; ΔCFI = CFI difference; ΔSRMR = SRMR difference; ΔRMSEA = RMSEA difference; Level of SR SP = Level of self-reported emotional and behavioral problems

3.4. Group differences

Differences between groups have been identified and can be seen in **Table 3**. Females tend to engage less as cyberaggressors compared to boys (*Cohen's d =-0.24, p<.004*, z=-2.89). Adolescents exhibit a higher frequency of involvement in cyberbullying as cybervictims (*Cohen's d =0.22,* p<.000, z=4.35) or as cyberwitnesses (*Cohen's d =0.13,* p<.02, z=2.21) compared to preadolescents and less as cyberaggressors (*Cohen's d =0.08,* p=.28, z=1.06). In regard to self-reported emotional and behavioral problems, we came across some quite intriguing findings as outlined below. Those included in the group with high level of self-reported emotional and behavioral problems are frequently involved in cyberbullying in all the three roles, with associated large effect sizes.

Table 3. Differences regarding gender, age and level of self-reported emotional and behavioral problems in cyberbullying roles

	Cyberaggressor			**Cyberwitness**			**Cybervictim**		
	Z	**p**	**d**	**z**	**P**	**d**	**z**	**p**	**d**
F vs M	-2.831	.004	-.243	-.669	.48	-.047	-.035	.97	-.002
Pread vs Ad	1.006	.286	.084	2.211	.02	.138	4.352	.000	.226
Low vs High level	24.684	.000	1.552	24.413	.000	1.168	26.164	.000	1.101

Note: F = female; M = male; z = z test; d = effect size; pread = preadolescents = ≤13; ad = adolescents = >13; low vs high level = Low vs high level of self-reported emotional and behavioral problems

4. Discussion

This study aimed to validate the factor structure of the Cyberbullying Test and test the measurement invariance of the resulting factor model across gender, age and the level of self-reported emotional and behavioral problems groups in Romanian population of children and adolescent. The three-factor structure, as outlined by Garaigordobil (2017) is supported by our results.

Our results show that the initial triangular model of Cyberbullying Test exhibits acceptable fit indices. Empirical evidence has been obtained to support the scalar invariance, which implies that individuals who possess an equivalent level of the latent variable will exhibit same scores on the observable variable, regardless of factors such as gender, age or the level of self-reported emotional and behavioral problems emotional and behavioral problems. The achievement of scalar or strong invariance is crucial in justifying mean comparisons across groups, as it establishes the ability to do so. The presence of scalar invariance was observed, indicating that means can be confidently compared across gender, age, and the presence of higher or lower self-reported psychopathological symptoms.

Differences between groups have been identified and can be resumed as follows: (1) Females tend to engage less as cyberaggressors compared to boys; (2) Adolescents exhibit a higher frequency of involvement in cyberbullying as cybervictims or as cyberwitnesses compared to preadolescents and less as cyberaggressors and (3) Those included in the group with high level of self-reported emotional and behavioral problems are frequently involved in cyberbullying in all the three roles, with associated large effect sizes.

Additionally, a strong correlation was observed among the cyberaggressor, cyberwitness, and cybervictim subscales of the Cyberbullying Test. These results align with earlier data, particularly indicating a significant correlation between cybervictimization and cyberaggression (Brewer & Kerslake, 2015), cyberwitnessing and cyberaggression (Orue et al., 2023) and cyberwitnessing and cybervictimization (Holfeld & Mishna, 2018). This context is important to consider because cyberbullying is not a phenomenon that consists of discrete roles that exist independently of each other.

5. Implications

As scalar measurement invariance was established across all groups, the Cyberbullying Test may be used to effectively compare boys and girls, preadolescents and adolescents, as well as samples with or without self-reported emotional and behavioral issues.

Moreover, by identifying significant correlations between cyberbullying roles and self-reported emotional and behavioral issues, we underscored the significance of mental health implications when addressing cyberbullying, particularly regarding adolescents predisposed to such problems engaging in various cyberbullying roles.

6. Limitations

In the first place, since the research was conducted using a cross-sectional design, we are unable to draw any conclusions regarding the accuracy of the scale when evaluating any of the cyberbullying roles over the course of time. Second, rather than using a clinical instrument, a self-report questionnaire was used to determine whether or not the psychopathological symptoms were present.

Study 3: Indirect effects of parental and peer attachment on cyberbullying victimization among children and adolescents: The role of self-acceptance

1. Introduction

Cyberbullying is a worldwide problem that impacts children and adolescents, particularly those who are victimized, as evidenced by several studies (Tran et al., 2023; Molero et al., 2022; Li et al., 2022; Bai et al., 2021; Marciano et al., 2020). Victimization tends to increase progressively, reaching its peak prevalence between the ages of 11 and 15 (Tokunaga, 2010) ; therefore it is crucial to examine the factors that influence this phenomena..

1.2 Parent Attachment and Cyberbullying Victimization

Bowlby stated that the bond between parent and child is essential for a person's social development (Bowlby, 1988). This attachment impacts the formation of a working model of the self in relation to others, shaped by past experiences and influencing future behaviors and expectations in new situations (Bowlby, 1988; Kobak & Sceery, 1988). A meta-analysis published in 2018, revealed a small effect size indicating a trustworthy but indirect relationship between parent-child attachment security and peer victimization (Ward et al., 2018)..

1.3 Peer Attachment and Cyberbullying Victimization

Peer group is considered a safe haven of proximity for adolescents (Gorrese & Ruggieri, 2012), while peer attachment developed in the group is defined as a strong connection formed when children trust that a peer will be present and supportive during difficult times (Nickerson & Nagle, 2005). It is essential to examine the role of peer attachment in the context of cyberbullying, as indicated by a meta-analysis demonstrating the significant effect of peer influence (Giletta et al., 2021).

1.4 Self-Acceptance and Cybervictimization

Self-acceptance, also considered a "healthier" substitute for self-esteem (Szentagotai & David, 2013) is a construct that has been formulated in relation to the notion of enhanced self-esteem, which has been deemed problematic due to its emotional vulnerability to criticism (Schlenker et al., 1976) or aggression (Baumeister et al., 1996).

An examination of the cyberbullying literature reveals a wealth of research examining the link between cyberbullying involvement and self-related cognitions such as self-esteem (e.g., Hayes et al., 2022), self-efficacy (e.g., Romera et al., 2017), self-concept (e.g., Cañas et al., 2019) or self-blame (e.g., Rey et al., 2020). To our knowledge, no research has explored the relationship between the concept of self-acceptance as it is conceptualized in the REBT framework and involvement in cyberbullying among children and adolescents. The aim of this research is to examine the influence of peer and parental attachment and self-acceptance on cyberbullying victimization in children and adolescents. The present study is the first attempt to fill this void in the current corpus of research.

1.5 Study Aims and Hypotheses

The objective of our study was to examine the mediating role of self-acceptance in the relationship between attachment quality (specifically with parents and peers) and cyberbullying victimization among a sample of adolescents. It was hypothesized that the effect of parental attachment, specifically through the components of alienation, trust, and communication, on the experience of cyberbullying victimization would be influenced by self-acceptance. Furthermore, we investigated the moderating role of gender and age on the relationship between self-acceptance and victimization through cyberbullying. We expected that the effect of peer

attachment on cyberbullying victimization would be mediated by self-acceptance, through each component of the attachment - alienation, trust, and communication. Our last hypothesis is that the relationship between self-acceptance and cyberbullying victimization will be moderated by gender and age.

2. Method

2.1 Participants

A total of 1934 Romanian children and adolescents, with a percentage of 66.44% female has been included in this study. The age range was between 10 and 17 years, with a mean age of 15.02 years, SD=1.53. Participants attended public middle and high schools. Participants spent varying amounts of time online in a single day: 20% spent 1-3 hours, 34% spent 3-5 hours, 27% spent 5-7 hours, and the remaining 5% spent over 7 hours.

2.2 Measures

The Unconditional Self-Acceptance Questionnaire (USAQ; Chamberlain & Haaga, 2001) evaluate unconditional self-acceptance. It consists of 20 statements intended to reflect the various aspects of the unconditional self-acceptance (USA) philosophy and practice as derived from the rational-emotive behavior therapy (REBT) literature

Cyberbullying Test (Garaigordobil, 2017) assess adolescents' participation in cyberbullying. It consists of 45 items that assess 15 distinct cyberbullying behaviors. These items are organized based on the specific role played in instances of cyberbullying, namely cybervictim, cyberaggressor, and cyberwitness. We used the cybervictim subscale in this study.

Inventory for Parent and Peer Attachment—Revised (Gullone & Robinson, 2005) is a self-report scale designed to evaluate young individuals' views on their connections with parents

and peers about trust, communication, and alienation. The parent section consists of 28 items, while the peer section consists of 25 items resulting in two attachment scores: parents and peer attachement.

2.3 Procedure

The present study has received ethical approval from the Ethics Committee of Babes-Bolyai University and furthermore, informed consent was obtained from schools and parents or legal guardians of the participants. The data was collected online from children and adolescents during their normal school hours using mobile devices.

2.4 Data Analysis Plan

All analyzes were conducted in Rstudio (RStudio Team, 2019), The hypotheses were tested via structural equation modeling (SEM, path analysis). We specified four path models.

Results

3.1 Preliminary Analyses

We identified 186 multivariate outliers ($\chi^2 = 134.75$, $p < .001$). These outliers were excluded from the analysis.

Table 1 *Means, standard deviations, and Pearson correlation coefficients*

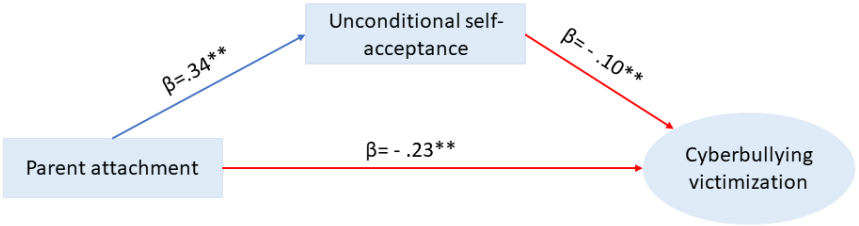
Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Peer alienation	11.33	2.53							
2. Peer Trust	25.99	3.98	-.69**						
3. Peer communication	19.43	3.45	-.61**	.82**					
4. Parent trust	25.66	4.03	-.22**	.21**	.10**				
5. Parent communication	23.47	4.33	-.25**	.20**	.14**	.82**			
6. Parent alienation	13.17	3.55	.37**	-.21**	-.11**	-.77**	-.75**		
7. Bullying victimization	17.68	3.47	.16**	-.17**	-.05*	-.25**	-.22**	.27**	
8. Unconditional self-acceptance	61.13	9.68	-.31**	.23**	.14**	.34**	.34**	-.43**	-.18
9. Parents Attachment	57.66	4.03	-.22**	.21**	.10**	-	-	-	-.25
10. Peer attachment	62.09	9.00	-	-	-	.19**	.21**	-.24**	-.14

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. * indicates $p < .05$. ** indicates $p < .01$.

3.2 Parent attachment

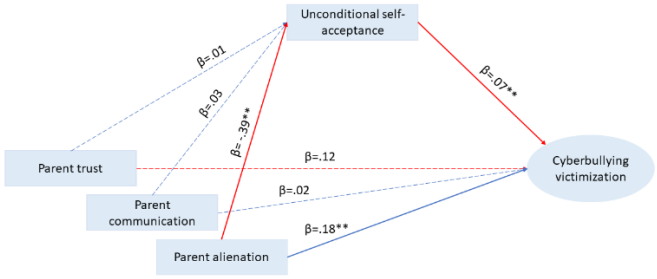
In *Model 1* (see **Fig. 1**) all paths were statistically significant. The fit indices of the model were acceptable (RMSEA = .026, CFI = .97, TLI = .97, SRMR = .065). Parent attachment predicted more unconditional self-acceptance (β = .34, $p < .001$) and less cyberbullying victimization (β = -.23, $p < .001$). Unconditional self-acceptance predicted less cyberbullying victimization (β = -.10, $p < .001$). The indirect effect of parent attachment on cyberbullying victimization through unconditional self-acceptance was significant (β = -.04, $p < .001$)

Fig 1 Model 1 – Path analysis regarding the relationship between parent attachment on cyberbullying victimization via unconditional self acceptance. Parameters represent non-standardized coefficients (β). **p<.001



For *Model 2* see **Fig. 2**. The fit indices of the model were acceptable (RMSEA = .026, CFI = .98, TLI = .98, SRMR = .063). Parent alienation predicted less unconditional self-acceptance (β = -.39, $p < .001$) and more cyberbullying victimization (β = .19, $p < .001$). Parent trust and parent communication did not predict unconditional self-acceptance and cyberbullying victimization. Unconditional self-acceptance predicted less cyberbullying victimization (β = -.07, $p < .001$). The indirect effect of parent alienation on cyberbullying victimization through unconditional self-acceptance was significant (β = -.03, $p < .002$)

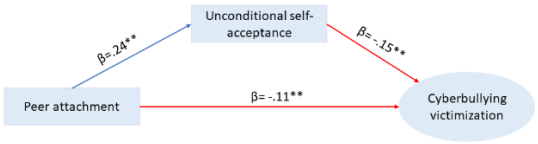
Fig 2 Model 2 - Path analysis regarding the relationship between each subscale of the parent attachment measure on cyberbullying victimization via unconditional self acceptance. Parameters represent non-standardized coefficients (β). **p<.001



3.3 Peer attachment

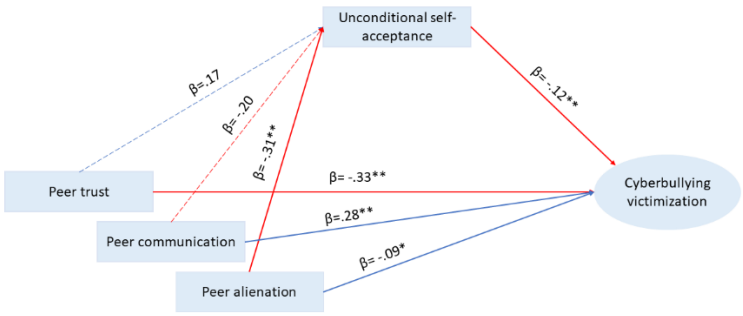
In *Model 3* (see **Fig. 3**) all paths were statistically significant. The fit indices of the model were acceptable (RMSEA = .025, CFI = .98, TLI = .97, SRMR = .062). Peer attachment predicted more unconditional self-acceptance (β = .24, $p < .001$) and less cyberbullying victimization (β = - .11, $p < .001$). Unconditional self-acceptance predicted less cyberbullying victimization (β = -.15, $p < .001$). The indirect effect of peer attachment on cyberbullying victimization through unconditional self-acceptance was significant (β = -.04, $p < .001$)

Fig 3 Model 3 - Path analysis regarding the relationship between peer attachment on cyberbullying victimization via unconditional self acceptance. Parameters represent non-standardized coefficients (β). **p<.001



For *Model 4* see **Fig. 4**. The fit indices of the model were acceptable (RMSEA = .023, CFI = .98, TLI = .97, SRMR = .057). Peer alienation predicted less unconditional self-acceptance (β = -.31, $p < .001$) and more cyberbullying victimization (β = .08, $p < .001$). Peer communication predicted more cyberbullying victimization (β = .28, $p < .001$) while peer trust predicted less cyberbullying victimization (β = -.32, $p < .001$). Unconditional self-acceptance predicted less cyberbullying victimization (β = -.12, $p < .001$). The indirect effect of peer alienation on cyberbullying victimization through unconditional self-acceptance was significant (β = .04, $p < .001$).

Fig 4 Model 4 - Path analysis regarding the relationship between each subscale of the peer attachment measure on cyberbullying victimization via unconditional self acceptance. Parameters represent non-standardized coefficients (β). **p<.001



4. Discussion

Our findings indicate that both parental and peer attachment predict higher level of unconditional self-acceptance and lower level of cybervictimization. Additionally, unconditional self-acceptance is associated with a reduced likelihood of experiencing cyberbullying victimization.

In our study, peer alienation and communication predicted a significant lower level of unconditional self-acceptance and a higher level of cybervictimization. Trust did predict a lower level of cybervictimization, but he impact through self-acceptance was not significant and based on these findings, our fourth hypothesis has been partially confirmed.

The relationship between self-acceptance and cybervictimization was shown to be stronger among male adolescents when considering parental and peer attachment. In the same time, the regression path between peer alienation and unconditional self-acceptance was stronger in females than males children.

With respect to age, we hypothesized that the relationship between self-acceptance and cybervictimization, as influenced by parental and peer attachment, would be moderated by age. However, this hypothesis was not supported by the data. Instead, the pathway between peer alienation and cyberbullying victimization was found to be significantly stronger in early adolescents compared to late adolescents.

5. Limits and future research

The study's cross-sectional methodology restricts us from making definitive causal conclusions on the relationships between parental and peer attachment, adolescents' self-acceptance, and their participation in cyberbullying as victims. Our data is based entirely on self-

report measures, which could lead to behavior being under-reported. Moreover, the present paper has focuses exclusively on cyberbullying victimization.

Study 4: Longitudinal associations between irrational cognitions and cybervictimization in adolescents

1. Introduction

Cyberbullying is a deliberate form of aggression that is performed by a single person or a group using technology, such as instant messaging, online websites (such as social media platforms, video-sharing sites, or gaming sites), or videos, text messages, and images shared online. It is pervasive and persistent over a prolonged amount of time, and it is directed towards a victim who is unable to protect themselves (Hinduja & Patchin, 2008; Smith et al., 2008).

The Rational Emotive Behavior Therapy (REBT) (Ellis, 1962) posits through the ABC that model emotional repercussions (C) are influenced by an individual's irrational views (B) on the circumstances that provoke them (A). Such circumstances may frequently constitute unpleasant occurrences experienced by people during their developmental years or subsequently in life. While the triggering event seems to be the source of the consequences, Rational Emotive Behavior Therapy asserts that beliefs are the fundamental components that generate the outcomes (Ellis & Grieger, 1986).

When it comes to categorize the irrational cognitions, there are various subtypes and according to the approach stated by Bernard (Bernard & Cronan, 1999) we can identify self-downing, intolerance of frustration rules, intolerance of work frustration and demands for fairness as subtypes of irrational beliefs.

Regarding cyberbullying research, there are multiple studies in which irrational cognitions were related to instances of cyberbullying victimization. Using a high-school male sample, Fallahi et al. (2022) concluded that cyberbullying experiences are related to irrational

cognitions. Sabanci and Çekiç (2019) highlighted in their research that irrational beliefs are predictors for cybervictimization, but not for cyberperpetration.

Currently, with the limited research available, we have some understanding of the role of cognitions in cybervictimization as either a predicting or mediating mechanism. Unfortunately, we hold less knowledge on the long-term effects of irrational cognitions in cybervictimization. It is unclear if the cognitions longitudinally predispose adolescents to victimization, whether victimization fosters the development of irrational cognitions, or if a bi-directional relationship exists between the two. This research aims to examine these gaps in literature regarding the long-term impact of irrational cognitions on cybervictimization and the possible transactional relationship between these factors.

1.2 Study Aims and Hypotheses

The aim of our research was to examine the association between cybervictimization and irrational cognitions among Romanian adolescents in a longitudinal design.

Based on existing data (Calvete et al., 2018) adolescents exhibiting a higher level of irrational beliefs are more susceptible to victimization, and children's characteristics, such as irrational beliefs about themselves and others, may contribute to or intensify their vulnerability to peer victimization (Harris & Petrie, 2003). In this regard, at the between-subjects level we hypothesized that adolescents who generally exhibit higher levels of irrational cognition will also report higher levels of cybervictimization. Moving forward and taking into account that it has been previously demonstrated that irrational cognitions are predictors for cyberbullying victimization (Sabancı & Çekiç, 2019), at the within-subjects level we hypothesized that the level of irrational beliefs will positively predict the level of cybervictimization at the subsequent

time point . In the same time, we also know that cyberbullying experiences are related to irrational cognitions in highschool males, and this is why we considered that the level of cyberbullying will positively predict the level of irrational beliefs at the next time point and that both cybervictimization and irrational cognition will exhibit a lingering effect from one time point to the next, such that higher levels of either are likely to be followed by similar levels at the subsequent time point. Based on the victim-schema model (Rosen et al., 2007) we hypothesize that there will be a positive association between individual-level fluctuations from one time point to the next in irrational cognition and cybervictimization

2. Method

2.1 Participants

The study sample consisted of 727 at first assessment (T1), 624 at second assessment (T2) and 769 at the third assessment point (T3) children and adolescents. The mean age was 13.15 years (SD = 1.21), 56% female and 42% were residing in urban areas.

2.2 Instruments

The Cyberbullying Test (Garaigordobil, 2017) was used to assess adolescents' participation in cyberbullying. It consists of 45 items that assess 15 distinct cyberbullying behaviors. These items are organized based on the specific role played in instances of cyberbullying, namely cybervictim, cyberaggressor, and cyberwitness.

The Child and Adolescent Scale of Irrationality (CASI, Bernard & Cronan, 1999) is a 28-item instrument designed to assess irrational cognitions in children and adolescents. In the current research, we employed questions that reflect irrational cognitions across several domains that include self-downing (SD), demandingness for fairness (DEM-F), low frustration tolerance

for work (LFTW), low frustration tolerance of rules (LFTR), and the overall score of irrationality level.

2.3 Procedure

The present study has received ethical approval from the Ethics Committee of Babes-Bolyai University, and furthermore, informed consent was obtained from schools and parents or legal guardians of the participants. The data was gathered online from children and adolescents during their regular school hours using mobile devices. The data collecting took place in January, March, and May of 2022.

2.4 Data Analysis Plan

All analyses were conducted in R, and the code is available online. The hypotheses were tested using the Random-Intercept Cross-Lagged Panel Model (RI-CLPM) (Hamaker et al., 2015). The autoregressive paths indicate the degree to which there is a carryover effect at the individual level (Hamaker et al., 2015). The *cross-lagged paths* assess whether a person's deviation in one variable at time (n) can predict their deviation in another variable at time (n+1) (Hamaker et al., 2015). Lastly, the residual correlations in the RI-CLPM measure the association between the unexplained (residual) variance of two variables at the same time point after accounting for stable person-level traits (random intercepts), autoregressive paths, and cross-lagged paths (Hamaker et al., 2015).

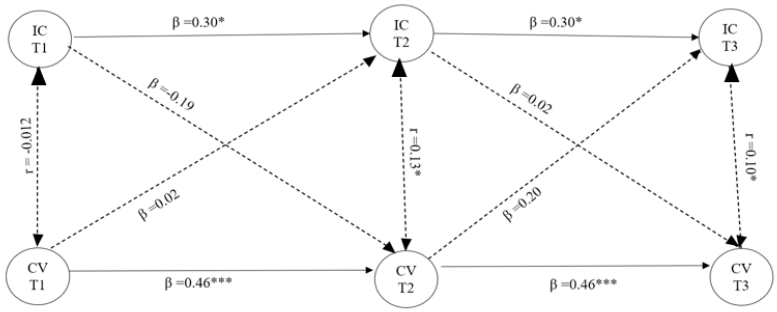
3. Results

All variables were within the acceptable range. The percentage of missing data was 18% at T1, 29% at T2, and 32% at T3. A total of 27 multivariate outliers were identified and excluded from the analyses ($\chi 2(18) = 42.31$, $p < .001$).

3.1 Cyberbullying victimization and total irrational cognitions (Model 1) (Fig. 1)

The RI-CLPM showed excellent fit indices (see Table 1; RMSEA < 0.05, CFI and TLI > 0.95), indicating a good fit between the model and the data. The autoregressive paths were significant for both cyberbullying victimization (b = 0.46, p < .001) and total irrational cognitions (b = 0.30, p = .024). No statistically significant cross-lagged effects were found from cyberbullying victimization to total irrational cognitions (b = -.19, p = .283) and from total irrational cognitions to cyberbullying victimization (b = .02, p = .568), indicating that person-level oscillations at one time point do not predict oscillations at subsequent time points for either cyberbullying victimization or total irrational cognitions. Significant correlations of the residuals were observed at T2 (r = .13, p = .024) and T3 (r = .10, p = .024). Finally, we found a significant correlation at the between-person level (r = 0.37, p < .001).

Fig. 1. Structural model for total irrational cognitions (IC) and cybervictimization



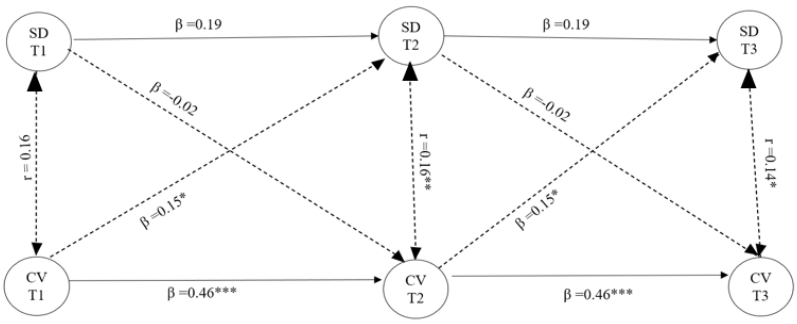
Note: *p < .05, **p < .01, ***p < .001; *IC – irrational cognitions, CV – cybervictimization, T1, T2, T3 – time points of data collection*

3.2 Cyberbullying victimization and self-downing (SD) (Model 2) (Fig. 2)

The RI-CLPM showed excellent fit indices (see Table 1; RMSEA < 0.05, CFI and TLI > 0.95), indicating a strong fit between the model and the data. The autoregressive path was

significant for cyberbullying victimization (b = 0.47, p < .001) but not for self-downing (b = 0.19, *p* = .072). No statistically significant cross-lagged effect was found from self-downing to cyberbullying victimization (b = −0.02, *p* = .803); however, a significant effect was observed from cyberbullying victimization to self-downing (b = 0.15, *p* = .047). Significant correlations of the residuals were observed at T2 (r = .16, *p* = .002) and T3 (r = .14, *p* = .002). Finally, a significant correlation was found at the between-person level (r = .31, *p* < .001).

Fig. 2. Structural model for self-downing (SD) and cybervictimization



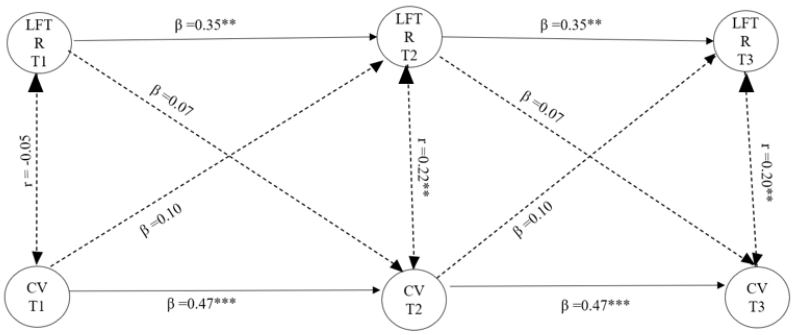
***Note**: *p < .05, **p < .01, ***p < .001; *SD – self-downing, CV – cybervictimization, T1, T2, T3 – time points of data collection*

3.3 Cyberbullying victimization and LFTR (Model 3) (Fig. 3)

The RI-CLPM showed excellent fit indices (see Table 1; RMSEA < 0.05, CFI and TLI > 0.95), indicating a strong fit between the model and the data. The autoregressive path was significant for cyberbullying victimization (b = 0.46, p < .001) and LFTR (b = 0.35, *p* = .001). No statistically significant cross-lagged effects were found from LFTR to cyberbullying victimization (b = -0.07, *p* = .396), and from cyberbullying victimization to LFTR (b = 0.10, *p* = .103). Significant correlations of the residuals were observed at T2 (r = .22, *p* < .001) and T3 (r =

.20, $p < .001$). Finally, a significant correlation was found at the between-person level (r = .37, $p < .001$).

Fig. 3. Structural model for low frustration tolerance for rules (LFTR) and cybervictimization

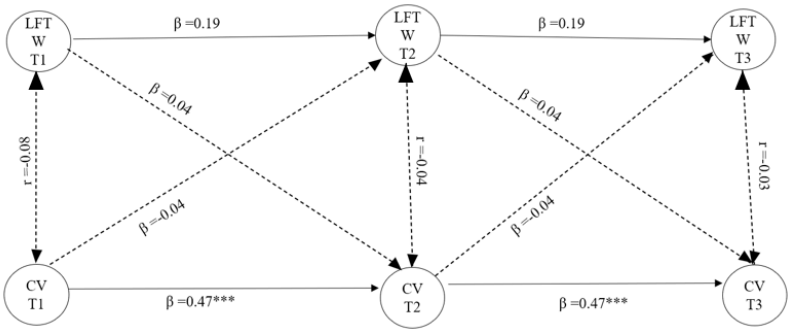


***Note**:* *p < .05, **p < .01, ***p < .001; *LFTR – low frustration tolerance for rules, CV – cybervictimization, T1, T2, T3 – time points of data collection*

3.4 Cyberbullying victimization and LFTW (Model 4) (Fig. 4)

The RI-CLPM showed excellent fit indices (see Table 1; RMSEA < 0.05, CFI and TLI > 0.95), indicating a strong fit between the model and the data. The autoregressive path was significant for cyberbullying victimization (b = 0.46, $p < .001$) but not for LFTW (b = 0.19, $p = .063$). No statistically significant cross-lagged effects were found from LFTW to cyberbullying victimization (b = 0.04, $p = .675$), and from cyberbullying victimization to LFTW (b = -0.04, $p = .501$). No significant correlations were found between residuals at T2 (r = -.04, $p < .457$) and T3 (r = -.03, $p < .457$). Finally, a significant correlation was found at the between-person level (r = .25, $p < .003$).

Fig. 4. Structural model for low frustration tolerance for work (LFTW) and cybervictimization

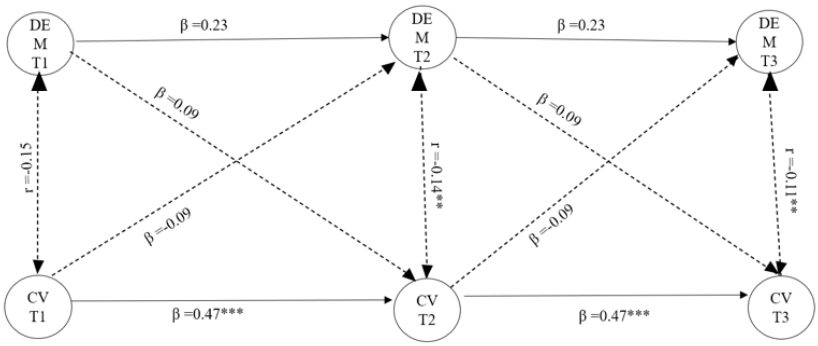


***Note**:* *p < .05, **p < .01, ***p < .001; *LFTW – low frustration tolerance for work, CV – cybervictimization, T1, T2, T3 – time points of data collection*

3.5 Cyberbullying victimization and Demandingness (DEM) (Model 5) (Fig. 5)

The RI-CLPM showed excellent fit indices (see Table 1; RMSEA < 0.05, CFI and TLI > 0.95), indicating a strong fit between the model and the data. The autoregressive path was significant for cyberbullying victimization (b = 0.47, $p < .001$) but not for demandingness (b = 0.23, $p = .053$). No statistically significant cross-lagged effects were found from demandingness to cyberbullying victimization (b = 0.09, $p = .394$), and from cyberbullying victimization to demandingness (b = 0.01, $p = .818$). Significant correlations were found between residuals at T2 (r = .14, $p = .007$) and T3 (r = .10, $p = .007$). Finally, an unsignificant correlation was found between-person level demandingness and cyberbullying victimization (r = .08, $p = .474$).

Fig. 5. Structural model for demandingness (DEM) and cybervictimization



***Note**:* *p < .05, **p < .01, ***p < .001; *DEM – demandingness, CV – cybervictimization, T1, T2, T3 – time points of data collection*

4. Discussions

This study seeks to investigate the limitations in literature regarding the lasting impact of irrationality on cybervictimization and the potential cross-lagged relationship among these variables. The concept has significant implications for understanding adolescents, since irrationality functions as a transdiagnostic factor for psychopathology.

Considering the first hypothesis at the between-subjects level, we identified significant correlations. This suggests that those adolescents experiencing more cyberbullying victimization are likely to report higher levels of overall irrational cognitions, and conversely. Furthermore, adolescents who report elevated instances of cyberbullying victimization are also likely to have increased levels of self-downing, LFTR, LFTW, and conversely.

Cybervictimization, seen as a recurrent stressful occurrence, may lead to a longer-lasting relationship with irrational cognitions. Future research might explore the association between irrational beliefs and emotional and behavioral impact in victims.

Concerning hypotheses 2 and 3, we did not observe statistically significant cross-lagged effects between the general level of irrational cognitions and cybervictimization, nor the reverse. We did not identify statistically significant cross-lagged effects among the overall levels of LFTR, LFTW, demandingness, and cyberbullying victimization, nor in the reverse direction. We observed significant effects of cyberbullying victimization on self-downing, but no reciprocal effect from self-downing to cyberbullying victimization.

For hypothesis 4, we identified significant autoregressive paths for cyberbullying victimization, overall irrational cognitions and LFTR. In instances of self-downing, LFTW and demandingness, the autoregressive paths were not significant, suggesting that such cognitions exhibit random oscillation at the person's level.

Concerning hypothesis 5, our results indicate that when an adolescent reports higher levels of cyberbullying victimization, exceeding anticipated averages and prior experiences, they simultaneously report similarly higher levels of total irrational cognitions, self-downing, LFTR and demandingness at the same time point. In case of LFTW the relationship has not been statistically significant.

5. Limitations

A first limitation is the disparity between the participants from rural and urban areas. In our research, a higher number of adolescents came from rural areas. A second limitation is the lack of assessment of participants' mental health status. Consequently, we do not have information on possible changes in cybervictim adolescents who experience, for example, depression or anxiety in relation to irrational cognitions. Third, the brief interval between measurements is a limitation, since it prohibits the detection of relationships over an extended

duration. It is possible that a prolonged interval between assessments might provide different outcomes. Simultaneously, the dropout rate seems substantial, and the variability in participants' answers may influence the findings.

CHAPTER IV. GENERAL CONCLUSIONS AND IMPLICATIONS

Cyberbullying victimization have many short-term and long-term negative consequences, including internalization and externalization problems (Fisher et al., 2016; Kwan et al., 2020). For this reason, numerous attempts have been made to better understand the paths that lead to cyberbullying victimization among children and adolescents.

We have identified several limitations in the literature regarding cyberbullying victimization and cognitive factors among children and adolescents.

Firstly, we identified an absence of a meta-analysis adressing the self-related cognitions among adolescents who are victims of cyberbullying.

Another limitation identified in the literature is that, despite a multitude of instruments for assessing cyberbullying and/or cybervictimization, there is currently no instrument with a triangular perspective that has been translated, adapted, and psychometrically evaluated for the Romanian population.

A third limitation is due to the absence of studies regarding the influence of cognitive processes, such as self-acceptance in relation to parents and friends, despite the existence of several research on parental and/or peer attachment in cybervictims.

One fourth limitation is that there is insufficient information on irrationality in adolescents who have experienced cybervictimization.

Furthermore, there is a deficiency in the longitudinal understanding of these processes among Romanian adolescents who experience cyberbullying victimization.

1. Summary of the main contributions of this thesis

Based on the studies that compose this thesis, the following main conclusions are to be drawn:

- ✓ Cybervictimization in children and adolescents is associated with a lower level of self-esteem, self-efficacy and self-concept. Meta-regression analyses revealed that the number of participants significantly moderated the relationship between self-esteem and cybervictimization, but the percentage of victims and mean age of participants did not exhibit significant moderation effects.
- ✓ The Cyberbullying Test is a measurement tool that adopts a triangular perspective to assess the experiences of individuals in regards to cyberbullying by including the perpetrator, the witness and the victim perspective. Our findings align with the established factorial structure, as postulated and examined by the scale's authors in their study on adolescents and preadolescents. Specifically, the three-factor structure, as outlined by Garaigordobil (2017) is supported by our results.
- ✓ Cyberbullying Test exhibits acceptable fit indices (CFI, RMSEA, SRMR) and our data supports the scalar invariance, which implies that individuals who possess an equivalent level of the latent variable will exhibit same scores on the observable variable, regardless of factors such as gender, age or the level of self-reported emotional and behavioral problems emotional and behavioral problems
- ✓ Differences between groups have been identified and can be resumed as follows: (1) Females tend to engage less as cyberaggressors compared to boys; (2) Adolescents exhibit a higher frequency of involvement in cyberbullying as cybervictims or as cyberwitnesses compared to preadolescents and less as cyberaggressors and (3) Those included in the group with high level

of self-reported emotional and behavioral problems are frequently involved in cyberbullying in all the three roles, with associated large effect sizes

- ✓ Both parental and peer attachment predict higher level of unconditional self-acceptance and lower level of cybervictimization. Additionally, unconditional self-acceptance is associated with a reduced likelihood of experiencing cyberbullying victimization.
- ✓ Peer alienation and communication predicted a significant lower level of unconditional self-acceptance and a higher level of cybervictimization. Trust did predict a lower level of cybervictimization, but he impact through self-acceptance was not significant and based on these findings, our fourth hypothesis has been partially confirmed.
- ✓ The relationship between self-acceptance and cybervictimization was shown to be stronger among male adolescents when considering parental and peer attachment. In the same time, the regression path between peer alienation and unconditional self-acceptance was stronger in females than males children.
- ✓ The pathway between peer alienation and cyberbullying victimization was found to be significantly stronger in early adolescents compared to late adolescents
- ✓ Increased levels of cybervictimization are associated with increased levels of irrational cognitions in a longitudinal 3 waves approach among adolescents.
- ✓ Increased levels of cybervictimization are associated with increased levels of self-downing, low frustration tolerance rules, low frustration tolerance work and demnandingness at the same time point. The only cross-lagged effect observed between variables was from cyberbullying victimization to self-downing. Results, limitation and practical implications are discussed.

2. Clinical implications

With relevance for mental health service providers we indicated that cyberbullying

victimization among children and adolescents is associated with a lower level of self-esteem, self-concept and self-efficacy. These results are relevant in the interventional field, guiding the clinical approach towards these mechanisms.

Mental health providers could use Cyberbullying Test to assess the level of cyberbullying roles including aggressor role, witness role and victim role among adolescents. Practitioners could also use Cyberbullying Test to make valid comparisons of cyberbullying roles across age, gender and self-reported levls of problems regarding mental health.

Interventions in cases of cybervictimization could also be oriented towards strenghtening the quality of the attachment between cybervictims and parents and friends. Besides, the self-acceptance as a healthier substitute for self-esteem can be seen as a new proposed mechanism in order to diminish the level of cybervictimization among adolescents. In this regard, mental health specialists could enhance the level of self-acceptance in cybervictims in order to develop an internal protective mechanism.

Finally, another cognitive mechanisms that could be addressed by the mental health professionals are those related to irrational cognitions. In this regard, we already highlighted that increased levels of cybervictimization are associated with increased levels of self-downing, low frustration tolerance rules, low frustration tolerance work and demnandingness at the same time point and that the only cross-lagged effect observed between variables was from cyberbullying victimization to self-downing. Professionals would approach the irrational beliefs by challenge them in order to minimize the impact of them towards the mental health of cybervictims.

3. Methodological implications

Compared to previous meta-analyses, Study 1 had several methodological strengths that

strengthened conclusions about the link between self-related cognitions and cybervictimization. It is the first study to focus exclusively on cyberbullying victims among children and adolescents, excluding other roles (e.g., aggressors, witnesses) for a more specific understanding. The research targeted individuals under 18 to ensure relevance to childhood and adolescence rather than emergent adulthood or workplace cyberbullying. It specifically examined self-related cognitions, excluding other types like irrational or normative cognitions. Additionally, all measurement instruments were analyzed and detailed in the supplementary materials. To minimize bias, dissertations, letters to the editor, and conference abstracts were excluded.

The research questions addressed in studies 2, 3, and 4 were rigorously answered using state-of-the-art analytical tools, such as the MG-CFA, Equivalence Test, Diagonally Weighted Least estimation procedure, structural equation modeling (SEM, path analysis) and Random-Intercept Cross-Lagged Panel Model (RI-CLPM). Furthermore, the analyses were performed in RStudio, and the scripts of the analyzes were made available as supplementary materials.

4. Theoretical implications

We showed that the effect size for the association between self-related cognitions and cybervictimization among children and adolescents is small (related to self-esteem and self-efficacy), medium (related to self-concept) or statistically insignificant (related to self-blame). In study 3 we provided valuable information regarding the influence of self-acceptance in the relation between parental and peer attachment and cybervictimization. In study 4, we tested the statistical plausibility of a model that could explain the influence of a larger typology of cognitions, namely irrational cognitions, in regard to cybervictimization among adolescents.

5. The main limitations of this thesis

Study 1

The first limitation is the inclusion of only participants under 18 years old.

Second, the study focuses solely on the relationship between four self-related cognitions and the victim role in cyberbullying.

Third, it reports victimization in online bullying.

Fourth, nearly half of the studies included were of poor quality based on the National Heart, Lung, and Blood Institute's (NHLBI) Quality Assessment Tool (Nhlbi, 2017), requiring cautious interpretation.

Fifth, most studies used correlational and cross-sectional designs, with only baseline data from longitudinal studies, preventing causal conclusions about cyberbullying victimization and self-related cognitions. It remains unclear whether cybervictimization influences self-related cognitions or vice versa. Additionally, the number of studies on self-blame, self-concept, and self-efficacy was limited, which may impact estimate accuracy despite sensitivity analyses suggesting robustness. The study found no research on the relationship between the REBT self-acceptance concept and cyberbullying victimization.

Another concern is the high variability in effect estimates, often excessively high or with wide confidence intervals (Jackson & Bowden, 2016). The significant heterogeneity remained unchanged in moderation and sensitivity analyses, raising concerns about the accuracy and credibility of effect measures (Ioannidis et al., 2007).

Some sensitivity analyses were based on a small number of studies, most of which were small to medium in size.

Study 2

The cross-sectional design prevents conclusions on the scale's accuracy over time in evaluating cyberbullying roles. Second, the study used a self-report questionnaire rather than a clinical instrument to assess psychopathological symptoms.

Study 3

The cross-sectional methodology limits causal conclusions regarding the relationships between parental and peer attachment, adolescent self-acceptance, and cyberbullying victimization. The reliance on self-report data may lead to underreporting of behaviors. The study focuses exclusively on cyberbullying victimization and does not include psychiatric diagnoses.

Study 4

A key limitation is the absence of an analysis of potential moderators, such as gender or age, in the relationship between irrational cognitions and cybervictimization. Another limitation is the disparity between rural and urban participants. Finally, the study did not assess participants' mental health, preventing insights into how conditions like depression or anxiety may influence irrational cognitions in cybervictim adolescents.

6. Future directions

To the best of our knowledge, study 1 represents the first attempt to analyze the relationship between self-related cognitions and cyberbullying victimization in children and adolescents. Future studies could analyze if there are differences, for example, in a population of

emergent adults. Besides, researchers could analyze the relationship between other roles, such as aggressor, bystander, or bully-victim, and self-related cognitions. Third, future studies could approach other self-related cognitions in relation with online victimization.

Since study 2 was conducted using a cross-sectional design, we are unable to draw any conclusions regarding the accuracy of the scale when evaluating any of the cyberbullying roles over the course of time. The longitudinal invariance of the Romanian version of the Cyberbullying Test should thus be investigated in studies that will be conducted in the future.

Regarding study 3, further longitudinal investigations are necessary to clarify the causal direction between parental and peer attachment, self-acceptance and cybervictimization. Subsequent research could include gathering data from several sources, including peers, teachers, or parents.

Study 4 is the first exploratory investigation examining longitudinaly the association between irrational cognitions and cybervictimization in adolescents. Future research might explore the association between irrational beliefs and emotional and behavioral impact in victims, given our understanding of the effects of cyberbullying on the mental health of the victims (e.g., Kwan et al., 2020) and the increased prevalence of irrational beliefs identified in our study

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