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**Ph.D. THESIS**

# A MULTILEVEL APPROACH IN ADDRESSING BULLYING BEHAVIOURS AMONG CHILDREN AND ADOLESCENTS: MECHANISMS AND PREVENTION PROGRAMS

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**A. Articles**

- **Balan, R**., Dobrean, A., & Balazsi, R. (2018). Indirect effects of parental and peer attachment on bullying and victimization among adolescents: The role of negative automatic thoughts. *Aggressive behaviour*, *44*(6), 561–570. https://doi.org/10.1002/ab.21775 (Impact factor 3.04)
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**B. Conferences**

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- The following publication do not form part of this thesis, but are of relevance to the present thesis focus and it has been published during the doctoral stage:
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    - Cristea, I.A., **Balan, R.,** & Dobrean, A. (2021). Letter: Methodologic and Reporting Issues in Published Meta-analysis. Accepted manuscript at *JAMA Pediatrics*. (Impact factor 11.24)

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Keywords: bullying victimization; bullying perpetration; prevention; mechanisms; multi-level; adolescents

# CHAPTER 1. THEORETICAL BACKGROUND

Bullying is a pervasive phenomenon among children and adolescents, with a mean prevalence estimated by meta-analyses over 30% for bullying victimization and bullying perpetration (Biswas et al., 2020; Modecki et al, 2014). With respect to the bullying perpetrated through the technology, the prevalence is estimated around 18% (Modecki et al., 2014). In Romania, the estimates are even higher, according to a report of World Health Organization, where Romania ranks on the 3rd place at rates of bullying in schools among 42 European Union's countries (WHO, 2016).

Bullying is not only an interpersonal problem per se, but also creates a host of adverse consequences for both youths directly involved in bullying as victims, perpetrators, or bully-victims as well as for those witnessing the incidents (Arsenault et et al., 2008; Copeland et al., 2013). Victims of bullying are at risk for developing various mental health disorders from the internalizing spectrum such as anxiety, depression, post-traumatic stress disorder, eating disorder and psychotic problems (Boden et al., 2016; Copeland et al., 2013). Victims are also likely to experience externalizing problems, such as conduct disorders (Moore et al., 2017). Similarly, for perpetrators, the mental health negative outcomes consist in heightened risk to develop externalizing problems as well as internalizing disorders (Ttofi et al., 2012). Both bullies and victims are likely to suffer from somatic problems, injuries as well as difficulties in the academic, social functioning, in short and long term (Brimblecombe et al., 2018; Gini, 2008). Youths with double status – bully-victims – are the most disturbed with respect to the mental health problems, academic and social functioning since they report more severe mental health problems than pure bullies and victims (Arsenault et al., 2006). The adverse effects of bullying extend beyond the dyad bullies-victims, since substantial evidence found out that even those youths who are not directly involved in bullying incidents but witness the incidents are prone to experience loneliness, anxiety, depression, and somatic symptoms (Callaghan et al., 2019).

Despite the high prevalence and the negative consequences associated with bullying involvement as well the efforts made till date to depict the pathways through which bullying occurs and to tackle these pathways through effective preventive programs, the current state of the art in this area still suffers of several limitations, both from a theoretical and methodological point of view. More specifically, although preliminary evidence in supporting the social-ecological model on one hand, and recommendations in applying this multi-systemic approach in preventing bullying, on the other hand, there is no study synthesizing the magnitude of the effect sizes of these multilevel programs in preventing bullying among children and adolescents. Numerous meta-analyses have been conducted, in order to synthesize the magnitude of the effect of the prevention programs on bullying and cyberbullying but none of them focused particularly on the multilevel programs, driven by the social-ecological theoretical framework (Gaffney, Ttofi, & Farrington, 2019; Hutson, Kelly, & Militello, 2018; Jiménez Barbero, Ruiz Hernández, Llor-Zaragoza, Pérez-García, & Llor-Esteban, 2015; Ttofi & Farrington, 2011). Since prevention programs and their efficacy are studied without linking them to a theoretical background and therefore to a coherent framework in understanding the mechanisms of change, the current status of the art regarding the preventive efforts for bullying among youths is far to be in line with the evidence-based approach (Insel, 2015).

Further, even in the context of investigating the effectiveness of the prevention programs without considering the theoretical framework that guided the development of the programs, a

host of methodological limitations have been identified in these previous meta-analyses, that preclude us to draw accurate conclusions about the current status of the effectiveness of the general anti-bullying prevention efforts. A major caveat lies in the fact that, although they claim that offer an estimate for the school-based prevention programs, they included in the process of computing of these estimates also intervention studies. This methodological artefact may inflate in an unjustified manner the overall effect sizes (Werner-Seidler, Perry, Calear, Newby, & Christensen, 2017). Further, no previous systematic attempt to disentangle between immediate and long-terms effect of the prevention programs have been identified. Prevention of maladaptive complex phenomenon or behaviors, such as school bullying, require a long-term and efortfull process, and it has sometimes been documented a so-called sleeper or delayed effect (Prochaska & Velicer, 1997). These are some important methodological points that we should aware when conducting a future quantitative synthesis of the prevention programs for bullying, since overcoming them would significantly improve the reliability and validity of the conclusions.

With respect to the fundamental research, amount research has been conducted on the risk factors for the multiple levels, postulated by the social-ecological model, in isolation. However, although the core assumption of the social-ecological model is the interplay between factors from multiple levels, little is known about how factors from a certain level interact and influence the factors from other levels. More specifically, it has been shown that the quality of relationships with parents and peers have been found to predict youths bullying perpetration and victimization, but literature investigating the mechanisms through which parental and peer attachment bond contribute to the youth's involvement in bullying is scarce. In addition, existing research focused predominantly on explaining how pure bullying victimization and perpetration occurs, failing to explain the dynamic between roles, especially how victims can become perpetrators and how parental factors impact this transition. Identifying the potential mechanisms from a multilevel approach explaining the occurrence and maintaining of both pure bullying perpetration and victimization as well as the double status of bully-victims is a pre-requisite for developing future effective evidence-based programs for preventing and treating bullying. In addition, the need for stoping the dynamic transition from victims to bullies is important since this double status of bully-victims have been associated with more severe adverse consequences, compared than pure victims or bullies (Gini & Pozzoli, 2009).

# CHAPTER II. RESEARCH OBJECTIVES AND OVERALL METHODOLOGY

The general aims of the thesis were bifolded. **First, the present thesis aimed to investigate the effectiveness of prevention programs and the mechanisms underlying bullying behaviours among youths through the lens of a multilevel approach, based on the social-ecological model.** As emphasized previously, the social-ecological theoretical framework has been widely used in order to understand the mechanisms involved in bullying behaviours as well as a framework guiding numerous programs for preventing and reducing this behaviour (Espelage, & Swearer, 2004). However, a closer examination concerning both the current status of the effectiveness of the multilevel prevention programs for bullying as well as the multilevel mechanisms behind bullying is needed, in the light of the numerous limitations identified. Namely, we were interested to provide a comprehensive overview on the effectiveness of multilevel prevention program for bullying and to further investigate the mechanisms of bullying among youths from a multilevel approach, by focusing on the interactions between individual and parental risk factors in explaining bullying perpetration and victimization, as well as the transition between these two roles.

**As a secondary aim, we were interested in improving the methodology applied in the research of bullying,** by considering the previous methodological limits in synthesizing the effects of the prevention programs for bullying and cyberbullying, beside the theoretical caveat already mentioned. From a methodological point of view, we were also interested in improving the domain of evidence-based assessment, by adapting and testing the measurement invariance of a scale assessing bullying behaviours among adolescents. An overview of the research studies conducted for attaining the general aims of the present thesis is presented in Figure 1.

**The first specific objective** was to quantify the effectiveness of the multilevel-based programs in preventing bullying and cyberbullying among children and adolescents. More specifically, we aimed to 1) quantify the effect sizes of the prevention programs based on the multivel theoretical framework on bullying perpetration, bullying victimization, cyberbullying perpetration and cybervictimization, both immediately after the completion of the programs and at follow-up and 2) examine potential moderators of the effectiveness of these programs. To achieve this goal, a meta-analysis of cluster randomized trials was conducted (Study 1). Through this meta-analysis, we aimed to surpass the theoretical and methodological limitations of the previous meta-analyses synthesizing the effectiveness of the prevention programs, in order to provide an accurate view on the actual status of the prevention programs regarding face to face and online bullying among youths.

**The second specific objective** was to adapt and validate in Romanian language Adolescent Peer Relationship Instrument (APRI-BT) (Parada, 2000), a multidimensional scale assessing bullying perpetration and bullying victimization as well as the three specific forms of bullying perpetration and victimization (physical, verbal, and social) among youths aged 10-18 years. This objective was pursued in Study 2, in which we tested the factorial structure as well as the measurement invariance across gender, age and clinical status of the Romanian version of the APRI-BT.

**The third specific objective** of the thesis was to investigate the mechanisms through which parents and peers can contribute to the involvement of youths in bullying perpetration and victimization, by taking a multilevel approach. Thus, in the Study 3 we tested the indirect effects of attachment to parents and peers on youths' involvement in bullying as victims and perpetrators

via their negative automatic thoughts. Moreover, we were also interested in exploring the role of specific contents of youths' negative automatic thought in this relationship. Given the substantial evidence supporting the role of interpersonal factors in youths bullying behaviours, depicting the potential intervening variables explaining this relationship is the next logical step in understanding bullying behaviours and the mechanisms that need to be targeted in prevention and intervention programs aiming to tackle this phenomenon.

**The fourth specific objective** of the current work was to explore the trajectory from bullying victimization to bullying perpetration through several distinct paths. More specifically, we were interested in conducting a preliminary cross-sectional study, exploring the role of irrational cognitions and externalizing problems as potential variables accounting for the relationship between bullying victimization and perpetration. In addition, we aimed at investigating the role of parental attachment as a potential moderator in this model. By doing this, we aimed to extend the use of multilevel approach in explaining not only the separate occurrence of bullying behaviours but as well in the understanding of the transition from victim to victimizer.

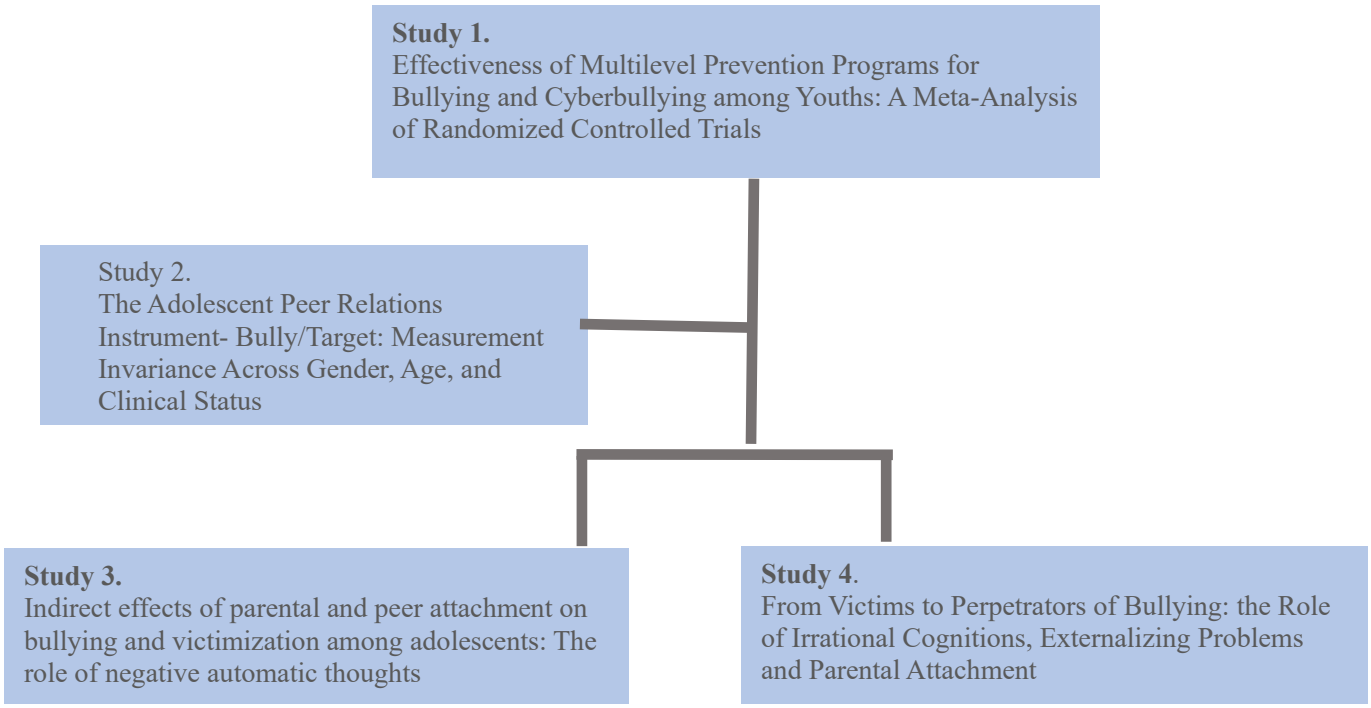


*Figure 1*. Overview of the research studies

# CHAPTER III. ORIGINAL RESEARCH

## 3.1. Study 1. Effectiveness of Multilevel Prevention Programs for Bullying and Cyberbullying among Youths: A Meta-Analysis of Randomized Controlled Trials

### 3.1.1. Introduction

Given the high prevalence and negative consequences of bullying and cyberbullying among youths, the development, and the evaluation of the prevention programs for these behaviours has become a priority in the last decades. Several systematic reviews and meta-analysis have been published on the effectiveness of school-based anti-bullying and cyberbullying programs among youths, with contradictory results (Gaffney, Farrington, Espelage, Ttofi, 2019; Hutson et al., 2018; Jiménez Barbero et al., 20 15; Ttofi & Farrington, 2011).

However, the ability to generalize the results of these meta-analyses is hampered by the theoretical framework as well as by the methodologies employed, in the context of an extremely heterogeneous literature on prevention programs. More specifically, from a theoretical point of view, despite substantial empirical research and extensive recommendations of the experts in the field towards complex programs designed following the principles of the social-ecological theory of bullying, targeting risk factors from multiple levels (e.g., individual, peers, family, classroom, school), how effective these complex prevention programs are remains unknown (Espelage, & Swearer, 2004). The previous meta-analyses failed to link the effectiveness of the prevention programs to a theoretical framework explaining bullying. This is of crucial relevance, since the evidence-based framework of prevention and interventions for psychological problems require not only having an impact on the outcome, but as well to be theory-driven and modify the mechanisms posited by that theory (Insel, 2015).

In addition, the potential of programs in preventing bullying behaviours in the long-term has not been addressed to date. An interesting question is whether the effects persist or reduce after longer periods, since the implementation of anti-bullying programs requires substantial efforts and expenses (Welsh, Farrington & Sherman, 2001). On the other hand, changing complex behaviours such as bullying is considered a long-term process therefore it is possible that anti-bullying and cyberbullying programs produce more favorable results in the long-term than immediately after the termination of the program (Prochaska &Velicer, 1997). Another methodological caveat concerns the estimation of effect sizes by combining programs with different goals; more specifically, previous meta-analyses calculated the effect sizes without disentangling between prevention and intervention (treatment) programs for bullying. This methodological approach raises questions about the real effect sizes of the effectiveness in preventing bullying because intervention (treatment) studies, usually yield higher effect sizes, because from the baseline the levels of bullying are posited to be significantly higher, which further may inflate the estimates for prevention programs (Werner-Seidler et al., 2017). Furthermore, some of the previous meta-analyses on efficacy of anti-bullying prevention

programs failed to distinguish between programs specifically designed to prevent bullying and more general interventions targeting peer violence and aggression as well as between their effects on each separate outcome (Jiménez Barbero et al., 2015). This could be problematic since bullying has been shown to have distinctive features and different underlying mechanisms from general aggression (Ostrov, Kamper-DeMarco, Blakely-McClure, Perry, & Mutignani, 2019).

Consequently, the present meta-analysis aims to address these issues and to provide a rigorous evaluation of multilevel prevention programs efficacy for bullying and cyberbullying among children and adolescents. More specifically, the objectives were twofold:

1. To investigate the effect of multilevel prevention programs on youths' bullying and cyberbullying behaviours, immediate post-intervention as well as the long-term impact
2. To investigate potentially relevant moderators of the program's effects

### 3.1.2. Methods

#### 3.1.2.1. Identification and selection of studies

A comprehensive literature search for identifying relevant studies was conducted in PsychInfo, PubMed, Scopus, Web of Science and Cochrane Library databases in March 2018, and updated in December 2018, using a combination of terms related to bullying behaviours (e.g., bullying, bully, bullied, bullies, cyberbullying, cybervictimization online bullying, victimization, bystander) to intervention (e.g., prevent, prevention, program, intervention, evaluation, effect, effectiveness, efficacy, impact) as well as terms indicating the design of the study (e.g., randomized, controlled, trial, RCT, cluster).

Eligible studies were: 1) evaluation of a prevention program specifically designed to address bullying and/or cyberbullying behaviour or targeting these behaviours was a core component of the program. In addition, it was required that the prevention programs target at least two levels from the social-ecological model of bullying (individual, peers, family, school, community); 2) reported bullying perpetration, bullying victimization, cyberbullying perpetration and/or cybervictimization as an outcome measure, assessed through self-report; 3) used an experimental design (randomized controlled trial); 4) study sample were children or adolescents, under age of 18, recruited from non-clinical population; 5) the study was published in an English language, in a peer reviewed journal.

#### 3.1.2.2. Data extraction and categorization

For each study included, the following information was extracted into a spreadsheet: authors, year of publication, type of outcome, age range of participants, name of the program tested, duration of the program, type of control group (no intervention, wait-list, active control, time point of assessment (post-intervention or follow-up and time point of the follow-up if applicable) and whether the program included a parental component or not (irrespective of the nature of the parental involvement). The primary outcomes of interest were the frequency/odds of traditional bullying perpetration, traditional bullying victimization, cyberbullying perpetration and cybervictimization, assessed through self-report.

#### 3.1.2.3. Quality assessment

Quality and risk of bias of primary studies was assessed using Cochrane Collaboration 'Risk of Bias'RoB 2.0 tool (Eldridge et al., 2016). Cluster RCTs were assessed for risk of bias arising from four sources: randomization process, identification, and recruitment of individual participants in relation to timing of cluster randomization timing, handling of incomplete data and selective reporting of the results. Given that most of the interventions included were school based, in which it is impossible to blind participants or researchers to the conditions, the criterion of blinding (participants, investigators and outcome) was excluded from the assessment. Further, for the purpose of conducting moderator analyses with the quality of primary studies, for each study an aggregated score for risk of bias was computed by assigning 2 points to each category of bias rated as low risk, 1 to those rated as having some concerns and 0 to each category of bias evaluated as having high risk.

#### 3.1.2.4. Meta-analytic procedure

All the statistical analyses were conducted using Comprehensive Meta-Analysis (CMA; Version 2.2.046) software. Post intervention effects were calculated separately for each category of outcome – bullying perpetration, bullying victimization, cyberbullying perpetration and cybervictimization – whereas follow-up effect size was computed only for face-to-face bullying behaviours, since only 2 studies reported follow-up data for cyberbullying programs. For each category of outcome, effect size was estimated using Cohen`s *d* (Cohen, 1988). Means, standard deviations and sample size were the primary statistics used to compute effect sizes for continuous data, whereas for the primary studies reporting outcomes in dichotomous forms, odd ratios with 95% confidence interval and percentages were used. Based on previous research on the field (Gaffney et al., 2019; Ttofi & Farrington, 2011), high heterogeneity among studies was expected, therefore, the effect sizes were calculated using a random effect model (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Heterogeneity among effect sizes was assessed with Q statistic and $I^2$ statistic (Borenstein et al 2009). The possibility of publication bias was first analyzed through the inspection of funnel plots and the Duval and Tweedie's trim and fill procedure, which provides an accurate estimate for the unbiased effect size (Duval & Tweedie, 2000). Sensitivity analysis were planned to be conducted: 1) with the exclusion of outliers. To be considered an outlier, the study had to have a pooled estimate size exceeding the 95% CI on both sides. 2) by parental involvement: analyses restricted to the programs with parental involvement and respectively to programs without parental involvement

For cases with significant heterogeneity and enough studies, two categories of moderators were investigated – categorical and continuous moderators. Categorical moderators were analyzed by subgroup analyses using mixed effects models, whereas continuous moderators (methodological quality of studies and sample size) were analyzed through meta-regression, using mixed-effects model (Borenstein et al., 2009).

In the first category, age of the participants (children – 10 years old or less vs. adolescents – greater than 10 years old), duration of the program (6 months or less vs. more than 6 months), type of control (active vs. non-active), whether the program tested had been developed by the same group of research vs. independent group were examined. For follow-up outcomes, in

addition, the type of follow-up was analyzed as a moderator (short follow-up up to 6 months post-intervention vs. long follow-up (more of 6 months). Continuous moderators included the sample size and the methodological quality of the studies.

### 3.1.3 Results

#### 3.1.3.1. Literature search

The flowchart of the study selection process is presented in Figure 2. A total of 11167 of candidate studies were identified through literature search. After removing duplicates, title and abstract of 7846 studies were screened. Of the 171 full-text studies, 44 met the inclusion criteria. Of the 44 studies, only 26 had sufficient data for effect size calculation. Therefore, the final meta-analyses results are based on 26 studies.

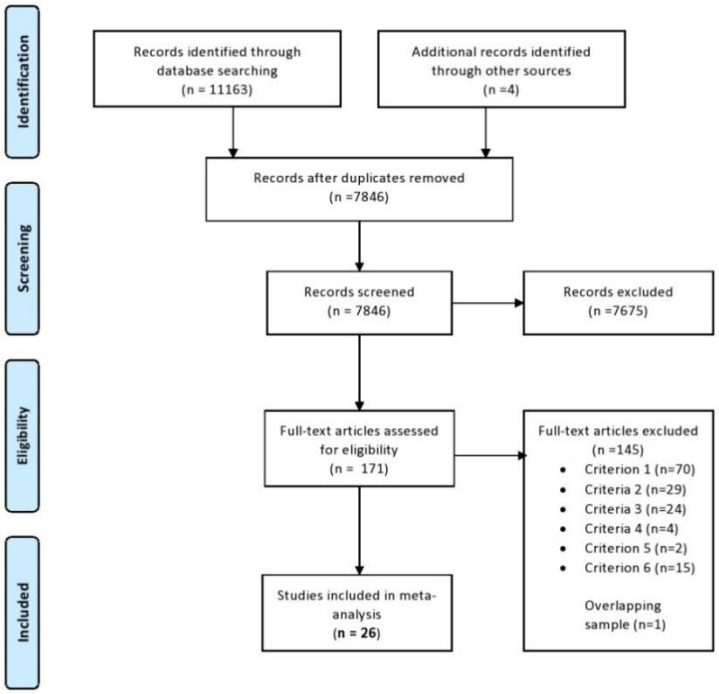


*Figure 2.* PRISMA flowchart of the study selection process

#### 3.1.3.2. Descriptive characteristics of included studies

Bullying perpetration measured at post-intervention was the outcome in 18 studies whereas bullying victimization at post intervention was reported in 17 studies. Post intervention cyberbullying perpetration as well as cybervictimization was measured in 5 studies each. At follow-up, bullying perpetration and bullying victimization outcomes were reported for 10 each. The follow-up length ranged from 1 month after the completion of the intervention to 1 year. The programs duration ranged from 1 day to 3 years, with most of the programs having a duration of 1 year. The age of the participants ranged 7 years from to 17 years. Of the 26 studies, 16 evaluated the effectiveness of prevention programs with parental involvement.

#### 3.1.3.3. Quality assessment

The main sources of bias for the primary studies were the randomization process and the identification and recruitment of individual participants in relation to timing of cluster randomization timing. Of 26 studies, 12 have been rated as having high risk of bias arising from the randomization process, 12 as having some concerns and only 2 were rated as having low risk

of bias in this domain. Further, 14 studies were evaluated as having high risk of bias because of the identification and recruitment of individual participants in relation to timing of cluster randomization timing, 9 as having some concerns and 9 as low risk of bias. Bias from incomplete data was high in 8 studies whereas some concerns and low risk was identified in 8, respectively in 10 studies. With respect to the bias deriving from selective reporting, only 2 studies were rated as having a high risk of bias and 3 presented some concerns.

**3.1.3.4. Meta-analysis results**

*3.1.3.4.1 Main effects at post-intervention.*

The results for the main effects at post-intervention and follow-up are presented in Table1. There was a small but significant effect size at post-intervention on bullying perpetration (*d*= 0.11, 95% CI: 0.05-0.17, p=.00). Heterogeneity was high (Q (18) = 106.53, p = .000, $I^2$ = 84.01). Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests no significant publication bias. Sensitivity analyses with the exclusion of 6 outliers resulted in a small increase from a d of 0.11 to an adjusted d of 0.16 and a slightly decrease of heterogeneity from $I^2$ = 84.01 to $I^2$ = 77.55.

The effect size for bullying victimization post-intervention was statistically non-significant (d= 0.02, 95% CI: -0.09 - 0.14, p= .685). Heterogeneity was high (Q (16) = 548.75, p = .000, $I^2$= 97.08). Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests a potential significant publication bias. After trimming the missing studies on the left of the mean (n=5), the effect size decreased from a d of 0.01 to an adjusted d of -0.05, but remained non-significant. Sensitivity analyses with the exclusion of 3 identified outliers yielded a decrease of the effect size (d= -.004, 95% CI -0.13 – 0.12, p=.956), but the effect remained non-significant. However, the direction of the effect size became negative, which suggests adverse effects of the programs on preventing bullying victimization, compared to control groups. The exclusion of the outliers did not influence the heterogeneity.

There was a non-significant effect size at post-intervention on cyberbullying perpetration (d= 0.02, 95% CI: -0.01- 0.06, p=.30). The $I^2$ indicated homogeneity among the studies (Q (5) = 1.71, p = .78, I 2 = 0.00). Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests no significant publication bias.

There was a non-significant effect size at post-intervention on cybervictimization (d= 0.03, 95% CI: -0.03- 0.11, p=.28). Heterogeneity among studies was medium (Q (5) = 12.23, p = .01, $I^2$ = 67.31). Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests no significant publication bias.

3.1.3.4.2. Main effects at follow-up.

Since only 4 studies reported follow-up data for cyberbullying outcomes, the pooled estimates were calculated only for face-to-face bullying. There was a small but significant effect size at follow-up for bullying perpetration (d= 0.12, 95% CI: 0.04-0.22, p=.006). Heterogeneity was medium (Q (9) = 23.52, p= .005, $I^2$ = 61.73). Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests no significant publication bias, since no study was trimmed. Exclusion of 2 outliers resulted in a very small decrease of the effect size, from a d of 0.12 to an adjusted d of 0.11, and a slightly decrease of heterogeneity ($I^2$ = 57.39).

There was a small but significant effect size at follow-up for bullying victimization (d= 0.07, 95% CI: 0.01-0.14, p=.017). Heterogeneity was low (Q (9) = 15.49, p=.070, $I^2$ = 41.91. Inspection of funnel plots and Duval and Tweedie trim and fill procedure suggests no significant publication bias.

**Table 1.**
*Standardized mean differences for anti-bullying programs compared to control condition at post-intervention and follow-up*

| Outcome | N | *d* | 95% CI | *p* | $I^2$ |
|---|---|---|---|---|---|
| | | | Post-intervention | | |
| Bullying perpetration | 18 | 0.11 | 0.05 - 0.17 | .000 | 84 |
| *Outliers excluded* | 12 | 0.16 | 0.09 - 0.22 | .002 | 77 |
| Bullying victimization | 17 | 0.02 | -0.09 - 0.14 | .685 | 97 |
| *Outliers excluded* | 14 | -0.00 | -0.13- 0.12 | .956 | 97 |
| Cyberbullying perpetration | 5 | 0.02 | -0.01- 0.06 | .30 | 0 |
| Cybervictimization | 5 | 0.03 | -0.03 - 0.11 | .28 | 67 |
| | | | Follow-up | | |
| Bullying perpetration | 10 | 0.12 | 0.03-0.22 | .006 | 61 |
| *Outliers excluded* | 8 | 0.11 | 0.01-0.20 | .020 | 57 |
| Bullying victimization | 10 | 0.07 | 0.01-0.14 | .017 | 41 |

N- number of studies
*d* - Cohen's d, using a random effect model, positive effect indicates the superiority of the intervention groups compared to control

*3.1.3.4.3. Sensitivity analysis for programs with and without parental involvement.*

Sensitivity analyses were conducted by distinguishing between programs with and without parental involvement. The results are detailed in Table 2. At post-intervention, the effect sizes for bullying perpetration were significant only for those programs with parental involvement (*d*= 0.17, 95% CI: 0.09-0.24, p=.00). For post-intervention bullying victimization, the effect sizes were non-significant for both types of prevention programs, irrespective of whether included a parental component or not (with parental involvement: *d*= 0.04, 95% CI: -0.10-0.19, p=.56; without parental involvement: *d*= -0.10, 95% CI: -0.31-0.13, p=.34). Moreover, the effect sizes for the interventions without parental involvement, although not significant, were in a negative direction for bullying victimization (*d*= -.14, 95% CI: -0.33-0.05, p=.15), indicating that these interventions increase bullying victimization, compared to controls.

**Table 2.**

*Standardized mean differences for anti-bullying programs programs with and without parental involvement at post-intervention and follow-up*

| Outcome | N | *d* | 95% CI | *p* |
|---|---|---|---|---|
| | Post-intervention | | | |
| | *With parental involvement* | | | |
| Bullying perpetration | 8 | 0.17 | 0.07 - 0.24 | .00 |
| Bullying victimization | 9 | 0.04 | -0.10 - 0.19 | .56 |
| | *Without parental involvement* | | | |
| Bullying perpetration | 4 | 0.12 | -0.03 - 0.28 | .12 |
| Bullying victimization | 5 | -0.10 | -0.31- 0.13 | .34 |
| | Follow-up | | | |
| | *With parental involvement* | | | |
| Bullying perpetration | 6 | 0.16 | 0.04-0.28 | .00 |
| Bullying victimization | 5 | 0.10 | 0.00-0.20 | .03 |
| | *Without parental involvement* | | | |
| Bullying perpetration | 4 | 0.09 | -0.03-0.21 | .15 |
| Bullying victimization | 5 | 0.05 | -0.03-0.14 | .22 |

At follow-up, there was a significant effect of the interventions with parental involvement both on bullying victimization (*d*= 0.10, 95% CI: 0.00-0.20, p=.03) and on bullying perpetration (*d*= 0.16, 95% CI: 0.04-0.28, p=.00), but not for the interventions without parental involvement (bullying perpetration: *d*= 0.08, 95% CI: -0.03-0.21, p=.15; bullying victimization: *d*= 0.05, 95% CI: -0.01-0.14, p=.22).

**3.1.3.5. Moderator analysis**.

Moderator analyses were conducted on the sample of studies remained after the exclusion of the outliers. For bullying perpetration at post-intervention outcome, subgroup analyses found evidence for duration of the intervention as a significant moderator of the effectiveness (p= .01), with a higher effect size for interventions of 6 months or shorter (d= 0.26, 95% CI 0.15 – 0.36), compared to interventions longer than 6 months (d= 0.09, 95% CI 0.01 – 0.17). Also, whether the developers of the anti-bullying program being tested were among the authors of the study was a significant moderator on self-report bullying perpetration outcomes (p= .04). Higher effect size was found for those studies conducted by the developers of the programs (d= 0.25, 95% CI .14 - .35). No evidence for the moderator effects was found for age or for type of control. For the outcome of bullying victimization post-intervention, none of the categorical moderators was significant. At follow-up, subgroup analysis indicated that no significant moderators emerged for bullying perpetration outcome.

Meta-regression results indicated that sample size was not a significant moderator neither for post-intervention bullying perpetration (β= -.000, Q model=1.38, p=.23), neither for follow-up bullying perpetration (β= -.000, Q model=0.66, p=.41). The methodological quality of the

studies was a significant moderator for bullying perpetration at follow-up (β= -.04, Q model= 10.59, p=.00), but not for the post-intervention outcome (β= .014, Q model=0.73, p=.39). With respect to the moderating effect of quality of studies for bullying perpetration at follow-up, a negative relationship was found, indicating that as the methodological quality of the studies increases, the effect size decreases.

### 3.1.4 Discussions

Overall, the current meta-analysis showed that multilevel anti-bullying programs seem to be beneficial for bullying perpetration immediately after post-intervention, with higher effects for programs with shorter duration, although the effect size was trivial. For bullying victimization, the meta-analysis indicated potential delayed effects since these effects only were observed only at follow-up. In other words, our meta-analysis documented long-term sustained effects of the multilevel prevention programs for bullying perpetration and delayed effect for bullying victimization. The discrepancy between post-intervention and follow-up for bullying victimization outcome might be attributed to the sleeper effects or delayed effects of the intervention (van Aar, Leijten, Orobio de Castro, & Overbeek, 2017). Most of the anti-bullying programs address the underlying factors for perpetration of bullying (e.g., empathy, self-serving cognitions) and less the mechanisms and risk factors for bullying victimization (Bernard, 2012). This means that the impact of the prevention programs on bullying victimization is likely to be mediated by preventing behaviours of the perpetrators, which could delay the visible effects on bullying victimization.

The present findings also emphasize the importance of involving parents in the efforts to prevent bullying among youths. The superiority of prevention programs for bullying including a parental component could be explained through the social-ecological model positing that individual risk factors for becoming a victim or a bully are proximal risk factors which are influenced by the distal factors of the contexts where the individual lives (Espelage, & Swearer, 2004). Since here we refer to prevention, targeting the more distal contextual risk factors such as parental factors is more successful in preventing bullying among youths than programs targeting more proximal risk factors, such as individual risk factors or school level factors.

On the other hand, the results for cyberbullying behaviour were even less promising since the existing programs do not have an effect either on cyberperpetration or cybervictimization. A potential explanation for the absence of effects on cyberbullying outcomes could be the lack of tailoring the programs to the particularities of cyberbullying. Most of the studies reporting cyberbullying and cybervictimization data included in the statistical analyses investigated the effectiveness of interventions designed for face-to-face bullying on virtual bullying behaviours (Gradinger et al., 2015). However, empirical studies suggest that there are also unique risk factors for involvement in cyberbullying behaviours such as knowledge in using technology, that are not targeted by traditional programs for face-to-face bullying (Cross et al., 2016).

Subgroup analyses indicated that duration of the programs and whether the developers of the programs were among authors of the study moderated the effect size for post-intervention bullying perpetration. More specifically, the effect size for this outcome was higher for shorter interventions, lasting 6 months. A similar pattern emerged at follow-up for bullying perpetration outcome. Although the moderation analysis was not significant, it can be observed that shorter programs produce significant effects whereas longer programs do not. This finding suggests that short interventions do not necessarily imply poor quality, but instead may be more engaging for

youths because they are less demanding (Arënliu, Strohmeier, Konjufca, Yanagida, & Burge, 2019). Effect sizes were also higher for those studies that were conducted by non-independent groups, that did include program developers among authors. Although the type of control was not a significant moderator of the effect sizes, it must be noted that the differences between groups was significant only for those studies with non-active control conditions, but not for those with active controls, for bullying perpetration outcomes post-intervention as well as follow-up. Another significant moderator was the methodological quality of the primary studies at follow-up, with higher effect sizes for studies with low methodological quality. These results may point us that the conclusions regarding the small effectiveness on long-term for bullying perpetration may be too optimistic, since are drawn from studies with a questionable quality.

Several limitations of the present meta-analysis must be acknowledged. First, the results for cyberbullying programs as well as for the programs with and without parental involvement were based on a small sample of studies, limiting the generalizability of the conclusions. More RCTs testing the effectiveness of cyberbullying programs are needed, as well studies using multi-informant assessment in order to provide accurate conclusions. A second major limitation consists in the differences in operationalization of bullying behaviours. Although all the studies adopted the definition of bullying emphasizing the three criteria of bullying – repeatability, intentionality, and power imbalance – only a few studies used scales that incorporated all the three criteria in the measurement strategy (e.g., Karna et al., 2011; Wolfer & Scheithauer, 2014). Given the debate around the conceptual overlapping between aggression and bullying, future studies should adopt a unitary measurement strategy, reflecting all the three core criteria of bullying behaviour, that differentiate bullying from general aggression (Vivolo-Kantor et al., 2014). Third, although there was a high degree of heterogeneity, for some of the outcomes, no significant moderator was significant. Other potential variables could moderate the effectiveness of the anti-bullying programs (e.g., proportions of boys and girls in the sample), but insufficient data were reported by the studies. In addition, most of the subgroup analyses were underpowered, limiting the possibility to identify significant moderators. Fourth, there was a high diversity of the type of parental involvement into the anti-bullying programs, from psychoeducation on bullying to involvement of parents as co-therapists and targets of programs, but the small sample of studies did not allow to contrast each type of parental involvement. Therefore, future studies should test whether the type of parental involvement moderates the effects of the programs with a parental component. It would also important that future studies evaluate the additive effects of each of the components of the multilevel approach targeted in the social-ecological prevention programs. It is possible that components addressing certain levels to produce more and higher gains than others. By taking into the account also the costs associated with complex interventions, targeting multiple systems, knowing which levels produce the most benefits in terms of preventing bullying will allow to customize more cost-effective prevention programs.

## 3.2. Study 2. The Adolescent Peer Relations Instrument Bully/Target: Measurement Invariance across Gender, Age and Clinical Status[1]

### 3.2.1. Introduction

Bullying is a widespread phenomenon among children and adolescents, with negative consequences for both victims and perpetrators. In order to identify the agents of bullying behaviour and to offer adequate interventions, evidenced-based assessment tools depicting both general and specific forms of bullying behaviours, with strong psychometric proprieties, are necessary. APRI-BT is a multidimensional scale measuring bullying and victimization, each in relation with 3 subdomains – physical, verbal, and social. Although psychometric proprieties and measurement invariance of APRI-BT has been tested, the research has been conducted with youths from individualistic countries (Marsh et al., 2011). This aspect might be problematic since a recent review suggests that these cultural values (individualism vs. collectivism) differentially impact how youths understand bullying behaviours (Sittichai & Smith, 2015). In addition, demonstration of measurement invariance for APRI-BT across mental health status had not been established. Evidence for measurement invariance across clinical and non-clinical groups is necessary to compare these two different groups on the latent construct, since previous studies highlighted differences in bullying rates between clinical and non-clinical population. (Neziroglu, Borda, Khemlani-Patel, & Bonasera, 2018; Rose & Gage (2017)).

Therefore, the objectives of the present study are 1) to investigate the factorial structure of APRI-BT, by testing an apriori six first-order factor structure and two second order factors (Bully including Bullying Physical, Bullying Verbal, Bullying Social and Victim including Physical Victimization, Verbal Victimization, Social Victimization) and 2) to investigate measurement invariance across age, gender and clinical status for APRI-BT in a Romanian sample of adolescents and pre-adolescents. The findings of this study will enhance the understanding of the measurement properties of the APRI-BT scale, aiding in the assurance that the bullying constructs are measured equally in boys and girl, in different ages, and in clinical and non-clinical population.

### 3.2.2. Methods

#### 3.2.2.1. Participants

[1] This study has been published in this form:

Balan, R., Dobrean, A., Balazsi, R., Parada, R. H., & Predescu, E. (2020). The Adolescent Peer Relations Instrument- Bully/Target: Measurement Invariance Across Gender, Age, and Clinical Status. *Journal of interpersonal violence*, Advance online publication. https://doi.org/10.1177/0886260520922350

The authors contributed to the article as follows: Balan, R.: study design, data analysis and interpretation, writing the manuscript; Dobrean, A.: study design, writing the manuscript; Balazsi, R :data analysis and interpretation, writing the manuscript; Parada, R..: study design, writing the manuscript; Predescu, E.: data collection, writing the manuscript.

Participants were recruited from both community (several Romanian schools) (n=847) and from a psychiatric inpatient unit (n=177). Participants from the clinical sample were diagnosed by a psychiatrist using according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (WHO, 1993). The final sample included 1024 youths (586 boys and 438 girls). The age of participants ranged from 10 to 18 years (M=13.99, SD=1.86). Two categories of age were created, in order to test cross-age measurement invariance: younger children (10 to 14 years, N=588) and older children (15-18 years, N=436).

**3.2.2.2. Measures**

*Adolescent Peer Relations Instrument, APRI-BT* (Parada, 2000) is a 36-item questionnaire, developed for measuring bullying perpetration and victimization among youths, each in relation with 3 subdomains – physical, verbal, and social. For the Bullying section, children are asked to rate the frequency of a series of behaviours perpetrated against other children, during the last school year (e.g.,"Got into a physical fight with a student because I didn't like them"). For the Victimization section, children are asked to evaluate the frequency with which they were the targets of these behaviours, during the last school year (e.g., "I was called names I didn't like"). The items are measured using a six-point Likert response scale (1 = Never; 2 = Sometimes; 3 = Once or twice a month; 4 = Once a week; 5 = Several times a week; 6 = Every day). Scores for each of the two sections range between 18 and 108, with higher scores indicating higher levels of bullying behaviour or victimization.

**3.2.2.3. Procedure**

Data were collected from several Romanian public schools and a psychiatric inpatient unit. After approval from school as well as from psychiatric unit boards was obtained, a letter with the study specifics was sent to the parents. Informed consent was obtained both from parents and youths prior to the enrollment in the study. The questionnaire was administered in the classroom and in the psychiatric inpatient unit in the presence of a trained research assistant. Time required for completion was about 30 minutes. The questionnaire was first translated from English into Romanian by a Romanian researcher and after that it was backtranslated into English by a second native Romanian speaking researcher. The back-translation and the original English version were then compared for accuracy.

**3.2.2.4. Data analysis**

Preliminary analyses were conducted with IBM SPSS Statistics 23. Confirmatory Factor Analysis (CFA) and Multiple-group confirmatory factor analysis (MGCFA) were conducted using Mplus 8.0 (Muthén & Muthén, 2017), in order to examine the hypothesized measurement model and to test for measurement invariance across gender, age and clinical status. Since the items exhibited a multivariate, non-normal distribution (Mardia skewness = 478.89, $p < 0.001$ and Mardia kurtosis = 2907.92, $p < 0.001$), the robust ML (MLR) estimation method was used, which adjusts standard errors of parameter estimates and chi-square statistics to account for non-normality (Satorra & Bentler, 1994). The full-information MLR estimator was used to account for missing data. FIMLR estimation is highly robust in the treatment of missingness efficiently, especially when missing response rate is low e.g., less than 5% (Enders, 2001). For the present investigation the mean missing rate was 4%.

The overall fit of each CFA model was assessed using: the $\chi 2$ (Jöreskog & Sörbom, 1993), the Comparative Fit Index (CFI; Bentler, 1990), and the Root Mean Square Error of Approximation (RMSEA).

Measurement invariance across groups was tested by using multiple-group CFA. First, the model fit for each group was assessed separately. Then, following the recommendations of Chen, Sousa & West (2005) and Dimitrov (2010) regarding second-order factor model invariance testing, several levels of group invariance were tested: i) an unconstrained baseline model (M0) in which all parameters differed between the two groups (configural invariance); ii) first order metric invariance model (M1) with all factor loadings were simultaneously constrained across groups; iii) second order metric invariance model (M2) obtained from Model 1 by adding equality constraints to second-order factor loadings across groups; iv) first order strong or scalar invariance (M3) a model in which all item intercepts were simultaneously constrained across groups. Invariance analysis started with the baseline model without invariance constraints, followed by the described sequence of nested models obtained by imposing constraints for invariance of model parameters. At each step, invariance across gender, age and clinical status was supported if, the $\Delta\chi 2$ difference between hierarchically consecutive models was found to be non-significant, the decrease in CFI and TLI was lesser than -.01, and the increase in RMSEA was lower than .015 (Chen, 2007).

### 3.2.3 Results

#### 3.2.3.1. Confirmatory factorial analysis

A second order confirmatory factor analysis, using the whole sample, was conducted to test whether the six first-order factor structure and two second order factors proposed by the authors of the scale was also supported in a Romanian sample. The model yielded an adequate fit to the data ($\chi^2 = 1321.17$, df = 587, CFI = .926, TLI = .92, RMSEA [90% CI] = .035 [.032, .037]). The standardized factor loadings are presented in Table 3.

The model was characterized by high factor loadings for the first-order factors (.556-.828) as well for the second order factors (.805-.972). Reliability measures derived from confirmatory factor analysis were also computed. The second-order factor model had the following composite reliability indices for the first order structure, respectively, for bully and victim: verbal bullying (CR=.85; .91), Social bullying (CR=.83; .88) and Physical bullying (CR=.85; .89). The composite reliability estimated for the second order structure yield a value CR=93 for the bullying factor and CR=.94 for the victimization factor. All CR was above the minimum level of 0.70, indicating a high degree of reliability (Fornell & Larcker, 1981). Average variance extracted (AVE) for the first-order factors, ranged between .44-.48 for bullying factors and between .56-61 for the victimization factors. The same estimates for the second order structure resulted, .80 for the bullying factor and .84 for the victimization factor. For first-order bullying factors the estimated AVE was less than 0.5, but their estimated composite reliability is higher than 0.6, the convergent validity of the construct is still adequate (Fornell & Larcker, 1981). Similar to previous studies, latent bullying factor and latent victimization factor positively correlated (r=.418) (Marsh et al., 2011). The second-order also shows good discriminant validity, given that the square root of the second-order AVE for each factor was above the correlation between second-order factors (Byrne, 2012).

**Table 3**

*CFA estimation of standardized factor loadings for APRI-BT*

| | Bully | | | | Victim | | | |
|---|---|---|---|---|---|---|---|---|
| | Verbal | Social | Physical | $R^2$ | Verbal | Social | Physical | $R^2$ |
| Verbal bullying | | | | | | | | |
| B1 | **.693** | .00 | .00 | .481 | | | | |
| B3 | **.749** | .00 | .00 | .561 | | | | |
| B5 | **.728** | .00 | .00 | .53 | | | | |
| B7 | **.726** | .00 | .00 | .527 | | | | |
| B10 | **.633** | .00 | .00 | .4 | | | | |
| B14 | **.621** | .00 | .00 | .385 | | | | |
| Social bullying | | | | | | | | |
| B4 | .00 | **.692** | .00 | .478 | | | | |
| B8 | .00 | **.723** | .00 | .523 | | | | |
| B11 | .00 | **.754** | .00 | .569 | | | | |
| B13 | .00 | **.675** | .00 | .456 | | | | |
| B17 | .00 | **.569** | .00 | .324 | | | | |
| B18 | .00 | **.556** | .00 | .31 | | | | |
| Physical bullying | | | | | | | | |
| B2 | .00 | .00 | **.73** | .533 | | | | |
| B6 | .00 | .00 | **.606** | .367 | | | | |
| B9 | .00 | .00 | **.668** | .446 | | | | |
| B12 | .00 | .00 | **.736** | .541 | | | | |
| B15 | .00 | .00 | **.696** | .485 | | | | |
| B16 | .00 | .00 | **.734** | .539 | | | | |
| Verbal victimization | | | | | | | | |
| V1 | | | | | **.757** | .00 | .00 | .574 |
| V4 | | | | | **.798** | .00 | .00 | .637 |
| V7 | | | | | **.828** | .00 | .00 | .685 |
| V11 | | | | | **.763** | .00 | .00 | .582 |
| V13 | | | | | **.809** | .00 | .00 | .655 |
| V18 | | | | | **.739** | .00 | .00 | .547 |
| Social victimization | | | | | | | | |
| V3 | | | | | .00 | **.764** | .00 | .583 |
| V6 | | | | | .00 | **.692** | .00 | .478 |
| V9 | | | | | .00 | **.771** | .00 | .594 |
| V12 | | | | | .00 | **.686** | .00 | .471 |
| V14 | | | | | .00 | **.771** | .00 | .595 |
| V17 | | | | | .00 | **.781** | .00 | .61 |
| Physical victimization | | | | | | | | |
| V2 | | | | | .00 | .00 | **.751** | .564 |
| V5 | | | | | .00 | .00 | **.742** | .551 |
| V8 | | | | | .00 | .00 | **.769** | .591 |
| V10 | | | | | .00 | .00 | **.701** | .492 |
| V15 | | | | | .00 | .00 | **.794** | .631 |
| V16 | | | | | .00 | .00 | **.816** | .666 |
| Second order factor loadings | | | | | | | | |
| Verbal bullying | | .909 | | .826 | | | | |
| Social bullying | | .805 | | .647 | | | | |
| Physical bullying | | .972 | | .945 | | | | |
| Verbal victimization | | | | | | .917 | | .842 |
| Social victimization | | | | | | .903 | | .815 |
| Physical victimization | | | | | | .935 | | .874 |

#### 3.2.3.2. Measurement invariance across gender

The results for MGCFA for cross-gender measurement invariance are presented in Table 10. Model 0, which included no cross-groups constraints (configural invariance), displayed a good fit. Thus, we could conclude that each construct was measured by the same items in each of the gender groups included in the analysis. Model 1, which includes equality constraints imposed to first order factor loadings, shows a good fit. The differences in CFI, TLI and RMSEA lower than 0.01, or 0.015, suggested that imposing constraints on factor loadings does not reduce the model fit, compared to Model 0. This indicates that the first-order factor loadings could be considered invariant across gender groups. Model 2 which tested the metric invariance of the second-order factors also demonstrated a good fit. As a consequence, we could conclude that second-order factor loadings are invariant across gender groups. Finally, we tested scalar invariance for items intercept (Model 3) and for second-order intercept (Model 4). Model 3 showed a good fit to data. Imposing equal constraints to items intercept resulted in a non-significant reduction of CFI, TLI and RMSEA, indicating that the scale shows scalar invariance across gender groups. Model 4 added to Model 3 equality constraints on second-order intercept. This model showed an acceptable fit to the data. Once again, CFI, TLI and RMSEA fit indices showed a non-significant modification.

#### 3.2.3.3. Measurement invariance across age

As seen in Table 10, the results of age group invariance analysis showed similar pattern to those obtained in the case of gender group invariance. The model fit of the measurement model with the data was acceptable in both age groups, 15-18 years adolescents showed a lower fit with the model compared to 10-14 aged pupils. The configural model (Model 0) showed a good fit to data, meaning that the pattern of factor loadings across age groups is similar. Imposing equality constraints to first order factor loadings (Model 1) does not modify significantly the fit of the model. Principal model fit indices (ΔCFI, ΔTLI and ΔRMSEA) did not decrease more than the cut-off values. This result suggests that the first-order factor loadings could be considered invariant across age groups. Imposing equality constraints to second-order factor loadings (Model 2) did not modified the fit of the model with the data, providing evidence of second-order factor loadings invariance. Further imposing equality constraints on item intercept (Model 3) and on second-order intercepts (Model 4) did not modified the model fit. In both cases, the fit indices that are not influenced by sample size (CFI, TLI and RMSEA) showed non-significant differences. These results provide evidence of invariant first-order factor loadings, second-order factor loadings, item intercepts and second-order intercepts across younger and older children (Chen, 2007)

#### 3.2.3.4. Measurement invariance across clinical status

Table 10 display the fit measures of the seven models tested for the measurement invariance across clinical and non-clinical groups. Model fit to data was found to be acceptable in both samples. The configural invariance model (Model 0) showed a good fit, indicating that construct has the same meaning in clinical and non- clinical population. Model 1 tested the first-order metric invariance, namely that item factor loadings are similar across clinical groups. The CFI, TLI and RMSEA differences were lower than the criterion of -.01, paired with changes in RMSEA lower than the cut-off of .015 suggest that there is no significant deterioration in the model fit compared to the previous model (Chen, 2007). The same pattern of results was found for Model 2, one that added one more constraints to those already imposed, namely equality of second-order factor loadings. The results support the invariance of second-order factor loadings across clinical groups. Model 3 and Model 4 are testing scalar

**Table 4**

*APRI-BT Second Order MGCFA Invariance across gender, age and clinical status*

| Model | $\chi^2$ | df | CFI | TLI | RMSEA[90%CI] | $\Delta\chi^2$ | ΔCFI | ΔTLI | ΔRMSEA | Decision |
|---|---|---|---|---|---|---|---|---|---|---|
| Gender invariance | | | | | | | | | | |
| Second-order model - Male | 1078.3 | 587 | .903 | .896 | .044 [.04, .048] | - | - | - | - | - |
| Second-order model - Female | 1048.25 | 587 | .914 | .908 | .037 [.033, .04] | - | - | - | - | - |
| Model 0 – Configural invariance | 2124.18 | 1174 | .909 | .903 | .04 [.037,.042] | - | - | - | - | - |
| Model 1 – Metric invariance of the first-order factors | 2159.23 | 1204 | .909 | .905 | .039 [.037, .042] | 35.05 | .000 | .002 | -.001 | Accept |
| Model 2 – Metric invariance of the first- and second-order factors | 2176.97 | 1208 | .907 | .903 | .04 [.037, .042] | 17.74* | -.002 | -.002 | .001 | Accept |
| Model 3 – Scalar invariance of the first-order factors | 2270.72 | 1242 | .902 | .900 | .04 [.038, .043] | 93.75* | -.005 | -.003 | .000 | Accept |
| Model 4 – Scalar invariance of the first- and second-order factors | 2309.06 | 1244 | .898 | .898 | .041 [.038, .043] | 38.34* | -.004 | -.002 | .001 | Accept |
| Age invariance | | | | | | | | | | |
| Second-order model - 10-14 years | 1101.83 | 587 | .922 | .917 | .039 [.035, .042] | - | - | - | - | - |
| Second-order model - 15-18 years | 1089.18 | 587 | .876 | .867 | .044 [.04, .048] | - | - | - | - | - |
| Model 0 – Configural invariance | 2190.5 | 1174 | .904 | .897 | .041 [.039,.044] | - | - | - | - | - |
| Model 1 – Metric invariance of the first-order factors | 2240.33 | 1204 | .902 | .898 | .041 [.038,.044] | 49.83* | -.001 | .001 | .000 | Accept |
| Model 2 – Metric invariance of the first- and second-order factors | 2259.79 | 1208 | .901 | .896 | .041 [.039,.044] | 19.46* | -.002 | -.002 | .000 | Accept |
| Model 3 – Scalar invariance of the first-order factors | 2350.54 | 1242 | .895 | .894 | .042 [.039,.044] | 90,75* | -.006 | -.002 | .001 | Accept |
| Model 4 – Scalar invariance of the first- and second-order factors | 2367.98 | 1244 | .894 | .892 | .042 [.039,.045] | 17.44* | -.001 | -.002 | .000 | Accept |
| Clinical invariance | | | | | | | | | | |
| Second-order model - Non-clinical | 1259.05 | 587 | .907 | .901 | .037 [.034, .04] | - | - | - | - | - |
| Second-order model - Clinical | 924.69 | 587 | .86 | .878 | .057 [.05, .064] | - | - | - | - | - |
| Model 0 – Configural invariance | 2238.62 | 1174 | .902 | .895 | .042 [.039,.045] | - | - | - | - | - |
| Model 1 – Metric invariance of the first-order factors | 2280.32 | 1204 | .901 | .897 | .042 [.039,.044] | 41.7 | -.001 | .002 | .000 | Accept |
| Model 2 – Metric invariance of the first- and second-order factors | 2284.48 | 1208 | .901 | .897 | 042 [.039,.044] | 4.16 | .000 | .000 | .000 | Accept |
| Model 3 – Scalar invariance of the first-order factors | 2349.86 | 1242 | .898 | .897 | .042 [.039,.044] | 65.38* | -.003 | .000 | .000 | Accept |
| Model 4 – Scalar invariance of the first- and second-order factors | 2373.91 | 1244 | .896 | .895 | .042 [.04,.045] | 24.05* | -.002 | -.002 | .000 | Accept |

* $p < .05$

invariance at item level and at the level of first-order factors intercept. ΔCFI, ΔTLI and ΔRMSEA were lower than the established cut-offs.

### 3.2.4. Discussions

Overall, our results confirm the factorial structure of the APRI-BT scale as well as measurement invariance across gender, age and clinical status in a Romanian sample of preadolescents and adolescents. With respect to the factorial structure of the Romanian version of APRI-BT, an a priori six first-order factor structure and two second order factors (Bully including Bullying Physical, Bullying Verbal, Bullying Social and Victim including Physical Victimization, Verbal Victimization, Social Victimization) of the APRI-BT had been investigated. The statistical fit indicators indicated a good fit of our data with both the six first-order factor as well with the two second order factors. These results are in concordance with the confirmed factorial structure proposed and tested by the authors of the scale on adolescents and preadolescents (Marsh et al., 2011). These findings emphasize the versatility of the APRI-BT measure, which can be used for both overall bullying and target of bullying behaviour assessment as well as for specific forms of bullying perpetration and victimization. The flexible use of the APRI-BT scale is important to further empirical research depicting the differential impact of specific types of bullying and victimization on youths' psychosocial adjustment (Baldry, 2004). Another aspect that has been investigated was the measurement invariance across age, gender, and clinical status for the Romanian version of APRI-BT. The findings of the current study demonstrate measurement invariance for the APRI-BT, across boys and girls, younger and older children as well as across clinical and non-clinical samples. There was support for configural invariance, which suggests that similar latent factors were presented across all groups. Results also offer evidence for metric invariance, which implies that factor loadings were similar for boys and girls, for younger and older children, for clinical and non-clinical samples. In addition, support was found for scalar invariance; individuals who have the same score on the latent construct will have the same score on the observed variable, irrespective of gender, age, or clinical status. This is of significant importance as the ability to justify mean comparisons across groups is established by attaining scalar or strong invariance. Scalar invariance was evidenced for both the first- and second-order factors in the model, means of the three first-order factors (verbal, social and physical) as well as the mean of the second-order factors (bullying and victimization) may be compared with confidence across gender, age, and clinical status groups. The findings of our study facilitate the advances in bullying research, theory, and intervention by identifying an instrument with solid psychometric proprieties for measuring bullying and victimization among preadolescents and adolescents.

Several limitations of the current study must be acknowledged. First, the cross-sectional nature of the study precludes us to make inferences about the scale's accuracy when assessing bullying and victimization over time. Therefore, future research should investigate the longitudinal invariance of Romanian version of APRI-BT. Second, there was an unequal distribution of youths between clinical and non-clinical sample. Given the differences documented in bullying and victimization frequency between community and clinical populations, future studies might benefit from more balanced mental health distributions in investigating measurement invariance across these groups (Neziroglu et al., 2018; Rose & Gage, 2017).

## 3.3. Study 3. Indirect Effects of Parental and Peer Attachment on Bullying and Victimization among Adolescents: The Role of Negative Automatic Thoughts[2]

### 3.3.1. Introduction

The association between parental and peer attachment and youths' bullying involvement is well documented in the literature (Murphy, Laible, & Augustine, 2017; Nikiforou, Georgiou, & Stavrinides, 2013). However, there is little research examining mechanisms linking the quality of relationships with parents and peers to bullying perpetration and victimization. A potential mechanism linking parent and peer attachment to bullying could be through youths' dysfunctional thinking, specifically negative automatic thoughts. This idea is supported by both Bowlby attachment theory and Beck's cognitive theory (Beck, 1987; Bowlby, 1969/82). Traditional attachment theories suggest that unhealthy internal working models of self and others originating from poor attachment experiences with early caregivers set the stage for later dysfunctional patterns in construing and responding to daily social interactions with others (Allen et al., 2004; Bowlby, 1988). Similarly, Beck's cognitive theory postulates that children develop maladaptive cognitive schemas through negative experiences with both their caregivers and peers. Further, these cognitive schemas are held to manifest on daily life through negative automatic thoughts about self, the world, and others, and to guide people's behaviour in multiple contexts, including social interactions (Rush & Beck, 1988). Previous studies have shown that attachment to both peers and parents plays an essential role in the development of adaptive and maladaptive beliefs in adults and adolescents samples (Gamble & Roberts, 2005; Lee & Hankin, 2009). Distorted cognitions, in turn, have been emphasized as a risk factor for social and behavioural maladjustment, such as bullying perpetration and victimization (Cook et al., 2010; Owens, Skrzypiec, & Wadham, 2014).

Drawing on these previous findings, the present study aims to test the indirect effects of attachment to mothers, fathers, and peers on youths' involvement in bullying as perpetrators as well as victims via adolescents' negative automatic thoughts, and by promoting understanding of the mechanisms involved in youths' bullying behaviour from an integrated interpersonal-cognitive framework. It was predicted that quality of attachment to the mother, to the father, and peers will be each negatively associated with adolescents' negative automatic thoughts, which in turn, will be positively associated with youths' bullying perpetration and victimization. Our second objective was to explore the role of specific themes of the negative automatic thoughts in the association between attachment to parents and peers and involvement in bullying perpetration and victimization. More specifically, we tested the indirect effects of poor relationships with

[2] This study has been published in this form:

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The authors contributed to the article as follows: Balan, R.: study design, data analysis and interpretation, writing the manuscript; Dobrean, A.: study design, writing the manuscript; Balazsi, R :data analysis, writing the manuscript.

parents and peers on bullying perpetration and victimization via specific cognitive contents of negative automatic thoughts— physical threat, social threat, failure, and hostility.

### 3.3.2. Methods

#### 3.3.2.1. Participants

Participants included 476 adolescents (199 boys and 277 girls), enrolled in public middle and high schools. The age of participants ranged from 10 to 17 years (M=14.00, SD=1.97). The initial sample was randomly split in two subsamples, sample N1=226, used for analyzing the theoretical model, and a cross-validation sample, N2=250 (Cudeck & Browne, 1983).

#### 3.3.2.2. Procedure

Data were collected from several Romanian public schools. After the approval of school boards was obtained, children were invited to participate in the study and a leaflet with the study specifics was sent to their parents. Both parents and students gave their informed consent prior to being enrolled in the study. Questionnaires were administrated in the classrooms during school hours, in the presence of a trained research assistant. The time required for completion was between 40 to 60 minutes.

#### 3.3.2.3. Measures

Inventory for Parent and Peer Attachment – Revised, IPPA – R (Gullone & Robinson, 2005) is a self-report scale designed to assess youths' perceptions of relationships with parents and peers in terms of trust, communication, and alienation. Scores range from 28 to 84 for the parent section, and from 25 to 75 for the peer section, with higher scores reflecting higher degree of attachment.

Children's Automatic Thoughts Scale-Negative/Positive, CATS-N/P (Hogendoorn et al., 2010) is a 50-item questionnaire measuring negative and positive self-cognitions in young people. Items are scored on a five-point scale, ranging from "not at all" (0) to "all the time" (4). CATS-N/P yields a total scale score as well as scores for five subscales: physical threat, social threat, personal failure, hostility, and positive thoughts.

Adolescent Peer Relations Instrument, APRI-BT (Parada, 2000) is a 36-item questionnaire, designed to assess traditional bullying and victimization, each in relation with 3 subdomains – physical, social, and relational. Scores for each of the two sections range between 18 and 108, with higher scores reflecting higher levels of bullying behaviour or victimization.

#### 3.3.2.4. Data analysis

The models, presented in Figure 3 and Figure 4, were tested using a path analysis (i.e., a structural model with observed variables) with AMOS (Version 23.0) (Arbuckle, 2014). In order to estimate free parameters Maximum likelihood (ML) estimation method was used. Bootstrap analyses were used to test the predicted indirect effects in these models. Model-data fit was considered acceptable if Chi square fit statistic was non-significant, CFI and TLI above .9, RMSEA smaller than .05 and SRMR below .05 (Kline, 1998). Statistical significance of path coefficients was also analyzed.

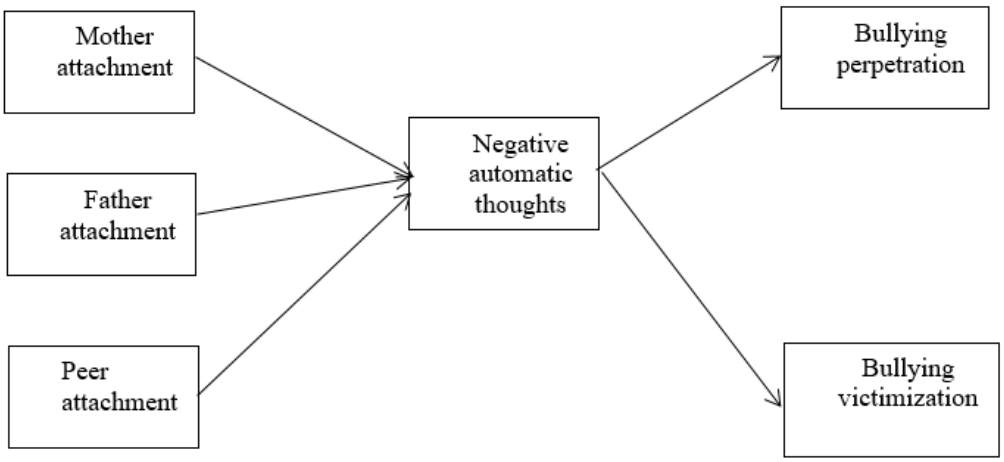


*Figure 3.* Proposed model of the relationships between parental and peer attachment, adolescents' negative automatic thoughts and bullying involvement

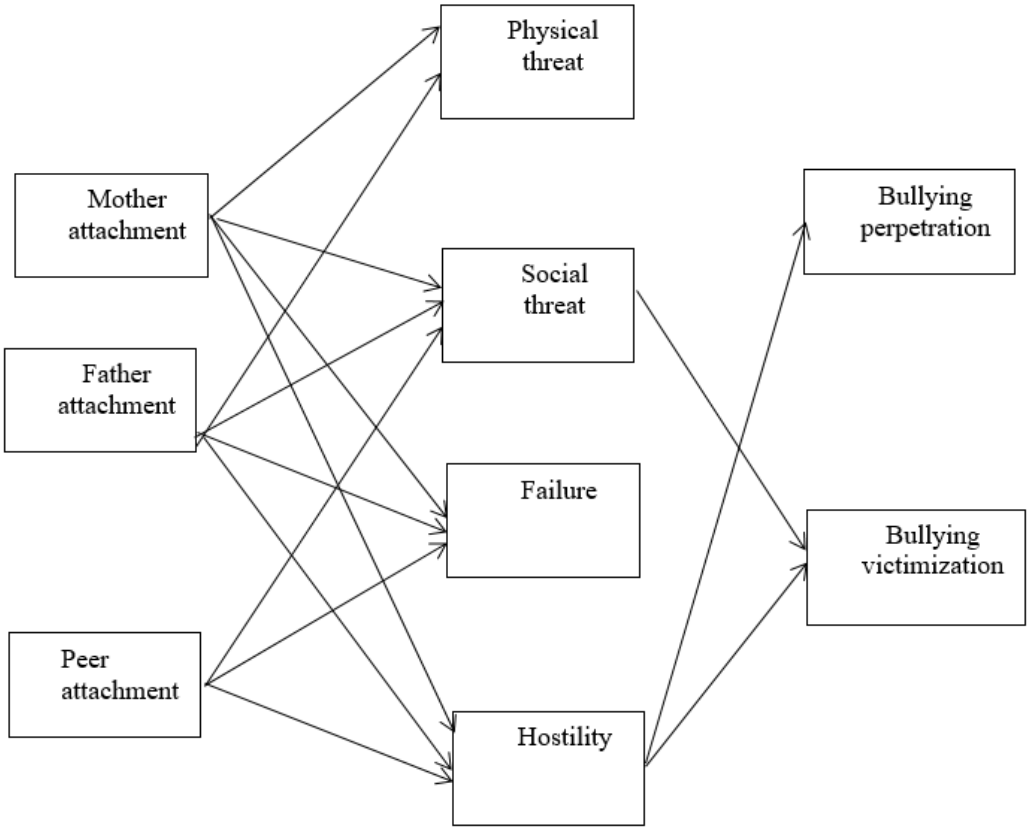


*Figure 4.* The re-specified model of the relationships between parental and peer attachment, contents of negative automatic thoughts and bullying involvement

### 3.3.3. Results

#### 3.3.3.3. Path analysis Model 1

First, path analysis was conducted to investigate whether attachment to mother, to father and peers were indirect predictors of adolescent bullying perpetration and victimization through elevated levels of negative automatic thoughts, using the testing sample (Sample 1). Results of the path analysis revealed satisfactory fit of the model to the data, showing the following fit indices: $\chi^2$ (df=6, N=226) =12.448, p = .053, CFI = .98, TLI = .95, RMSEA = .069, 90% CI [.000, .124] and SRMR = .0377.

Unstandardized bootstrap estimates of direct and indirect effects with 95% confidence intervals and significance test for both samples are shown in Table 4. All estimated paths were statistically significant. Attachment to each socialization agent was a significant predictor of adolescents' negative automatic thoughts, such that all the estimated unstandardized path coefficients were significant. Attachment to mother had a direct effect ($\beta$ = -.66, p <.01) on negative automatic thoughts. Attachment to father also had a direct effect ($\beta$ = -.74, p <.01) negative automatic thoughts. Peer attachment had a direct ($\beta$ = -.55, p <.01) effect on negative automatic thoughts. Adolescents' negative automatic thoughts significantly and positively predicted bullying perpetration ($\beta$ =.13, p <.01) as well victimization ($\beta$ =.19, p <.01).

All indirect effects were statistically significant in sample 1. Attachment to each parent as well as attachment to peers was indirectly related to bullying perpetration via negative automatic thoughts. Similarly, perceived attachment to each socialization agent was indirectly associated with youths' victimization through negative automatic thoughts.

For the purpose of cross-validating the initial model an independent sample was used (cross-validation Sample 2). In sample 2 the model also showed an acceptable fit to the data. The chi-square value was significant, $\chi 2$ (df = 6, N = 250) = 16.182, p =.013. However, because the chi-square statistic is sensitive to sample size, it's weight in our decision regarding model fit will be diminished (Sharma, 1996; Kline, 1998). Other fit indices were relatively high; Non-Normed Fit Index (NNFI) = .938, Comparative Fit index (CFI) = .975, Root Mean Square Error of Approximation (RMSEA) = .083 [.035; 0.132], and the Standardized Root Mean Square Residual (SRMR) = .051.

Findings from the path analysis showed that attachment to mother had a direct effect ($\beta$ = -.98, p <.01) on negative automatic thoughts. Attachment to father also had a direct effect ($\beta$ = -.50, p <.01) on negative automatic thoughts. Peer attachment had a direct ($\beta$ = -.54, p <.01) effect on negative automatic thoughts. Adolescents' negative automatic thoughts significantly and positively predicted bullying perpetration ($\beta$ =.09, p <.001) as well as victimization ($\beta$ =.22, p <.01). All indirect effects were found to be statistically significant. Overall, cross validation results provided strong support for the proposed model postulated in Figure 3.

#### 3.3.3.4. Path analysis Model 2

To address the second objective of the study, the predictors (attachment to mother, father, and peers) were configured into a model with bullying perpetration and victimization as criterion variables and physical threat, failure, social threat, and hostility as intervening variables. The predicted model failed to fit the data. Modification indices were used to explore how the model fit could be improved. The direct effects from attachment to peers to physical threat, from failure and physical threat to bullying victimization and from failure, physical threat, and social threat to bullying perpetration were not significant, so they were excluded from the model. The re-specified model is presented in Fig. 4. Results from path analysis using the testing sample

revealed good fit to the data: sample 1, $\chi^2$ (df=12, N=226) = 29.024, p = .004, CFI = .97, TLI = .93, RMSEA = .079, 90% CI [.043, .117]. Unstandardized bootstrap estimates of direct and indirect effects for model 2 are displayed in Table 5. In the testing sample, attachment to each parent was a significant predictor for thoughts of physical threat (attachment to mother, β = -.25, p <.01; attachment to father, β = -.21, p <.01), social threat (attachment to mother, β = -.16, p <.01; attachment to father, β = -.23, p <.01), failure (attachment to mother, β = -.17, p <.01; attachment to father, β = -.17, p <.01), and hostility (attachment to mother, β = -.12, p <.05; attachment to father, β = -.15, p <.0). Peer attachment was a significant predictor for social threat (β = -.10, p <.05), failure (β = -.21, p <.01) and hostility (β = -.14, p <.01). Further, social threat (β = .41, p <.01) and hostility (β = .41, p <.01) had a direct effect on bullying victimization while only hostility had a a direct effect on bullying perpetration (β = .68, p <.01).

All indirect effects were statistically significant in sample 1. Attachment to each parent as well as attachment to peers was indirectly related to bullying perpetration via hostility. Perceived attachment to each socialization agent was indirectly associated with youths' victimization through thoughts of social threat and hostility.

In the cross-validation sample the model also showed an acceptable fit to the data: $\chi^2$ (df=12, N=250) = 24.020, p = .02, CFI = .98, TLI = .96, RMSEA = .063, 90% CI [.024, .100]. Findings from the path analysis in sample 2 indicated that attachment to each agent of socialization had a direct effect on thoughts of failure (attachment to mother, β = -.30, p <.01; attachment to father, β = -.10, p <.05 ; peer attachment, β = -.10, p <.05) and hostility (attachment to mother, β = -.26, p <.01; attachment to father, β = -.11, p <.01; peer attachment, β = -.11, p <.05). Attachment to mother and peers also had a clear direct effect on thoughts of social threat (attachment to mother, β = -.28, p <.01; peer attachment, β = -.19, p <.01) whereas the direct path from attachment to father to social threat thoughts only showed a tendency toward significance (β = -.10, p = .055). In addition, attachment to each parent had a direct effect on thought of physical threat (attachment to mother, β = -.26, p <.01; attachment to father, β = -.18, p <.01). Further, social threat significantly and positively predicted bullying victimization (β = .55, p <.01) whereas hostility predicted bullying perpetration (β = .63, p <.01) as well victimization (β = .34, p <.01). All indirect effects were found to be statistically significant. Overall, cross-validation results provided strong support for the proposed model postulated in Figure 4.

**Table 4**

*Unstandardized bootstrap estimates of direct and indirect effects with 95% confidence intervals and significance test for model 1*

| | | | *Sample 1* | | *Sample 2* | |
|---|---|---|---|---|---|---|
| | | | Estimate [95%CI] | *P* | Estimate [95%CI] | *p* |
| Direct effects | | | | | | |
| Mother attachment | → | Negative automatic thoughts | -.66 [-.95, -.37] | .001 | -.98 [-1.35, -.60] | .001 |
| Father attachment | → | Negative automatic thoughts | -.74 [-1.02, -.49 | .001 | -.50 [-.84, -.21] | .003 |
| Peer attachment | → | Negative automatic thoughts | -.55 [-.85, -.24] | .003 | -.54 [-.83, -.21] | .006 |
| Negative automatic thoughts | → | Bullying perpetration | .13 [.06, .22] | .001 | .09 [.04, .14] | .001 |
| Negative automatic thoughts | → | Bullying victimization | .19 [.14, .25] | .001 | .22 [.16, .31] | .001 |
| Indirect effects | | | | | | |
| Mother attachment | → | Bullying perpetration | -.09 [-.16, -.04] | .001 | -.09 [-.17, -.04] | .001 |
| Father attachment | → | Bullying perpetration | -.10 [-.19, -.04] | .001 | -.04 [-.09, -.01] | .002 |
| Peer attachment | → | Bullying perpetration | -.07 [-.15, -.03] | .001 | -.05 [-.10, -.01] | .003 |
| Mother attachment | → | Bullying victimization | -.13 [-.20, -.07] | .001 | -.22 [-.34, -.13] | .001 |
| Father attachment | → | Bullying victimization | -.14 [-.21, -.08] | .001 | -.11 [-.20, -.05] | .002 |
| Peer attachment | → | Bullying victimization | -.10 [-.17, -.05] | .002 | -.12 [-.24, -.04] | .003 |

### 3.3.4. Discussions

The current study emphasizes the impact of parental and peer attachment on youths' involvement in bullying behaviour and identifies dysfunctional cognitions in the form of negative automatic thoughts as a mechanism linking negative attachment experiences with mothers, fathers, and peers to bullying perpetration as well to victimization. In addition, our study suggests that not all negative automatic thoughts are relevant for explaining the association between poor relationships and bullying involvement. It is only hostility and social threat thoughts that are.

The findings of the present investigation have several implications for research and practice. Our study is the first to model indirect pathways among attachment to parents and peers, youths' negative automatic thoughts and bullying involvement. Our results suggest common as well unique underlying processes across both bullying status groups. The fact that some youth with poor attachment relationships may come to engage in bullying perpetration behaviour, while others are more likely to become victims of bullying points to the possibility that attachment to significant others is a distal transdiagnostic risk factor, that leads to multiple dissimilar outcomes, whereas negative inferential cognitions may be the proximal transdiagnostic risk factor that explain the relationship between poor attachment and bullying perpetration as well victimization, and that launch youths with problematic attachment on pathways that are related to various maladaptive outcomes (Ein-Dor & Doron, 2015). With respect to particular contents of negative automatic thoughts, our results provide preliminary evidence for both a shared and a

**Table 5**

*Unstandardized bootstrap estimates of direct and indirect effects with 95% confidence intervals and significance test for model 2*

| | | | *Sample 1* | | *Sample 2* | |
|---|---|---|---|---|---|---|
| | | | Estimate [95%CI] | *P* | Estimate [95%CI] | *p* |
| Direct effects | | | | | | |
| Mother attachment | → | Physical threat | -.25 [-.35, -.14] | .000 | -.26 [-.40, -.14] | .000 |
| Mother attachment | → | Social threat | -.16 [-.29, -.05] | .005 | -.28 [-.44, -.16] | .000 |
| Mother attachment | → | Failure | -.17 [-.29, -.07] | .003 | -.30 [-.42, -.19] | .000 |
| Mother attachment | → | Hostility | -.12 [-.21, -.02] | .012 | -.26 [-.38, -.14] | .000 |
| Father attachment | → | Physical threat | -.21 [-.31, -.13] | .000 | -.18 [-.30, -.08] | .000 |
| Father attachment | → | Social threat | -.23 [-.33, -.14] | .000 | -.10 [-.21, .01] | .055 |
| Father attachment | → | Failure | -.17 [-.25, -.09] | .000 | -.10 [-.19, -.01] | .042 |
| Father attachment | → | Hostility | -.15 [-.24, -.06] | .000 | -.11 [-.21, -.01] | .000 |
| Peer attachment | → | Social threat | -.10 [-.21, -.02] | .036 | -.19 [-.29, -.10] | .000 |
| Peer attachment | → | Failure | -.21 [-.31, -.12] | .000 | -.10 [-.18, -.02] | .019 |
| Peer attachment | → | Hostility | -.14 [-.24, -.04] | .007 | -.11 [-.21, -.03] | .021 |
| Hostility | → | Bullying perpetration | .68 [.48, .91] | .000 | .63 [.46, .83] | .000 |
| Social threat | → | Bullying victimization | .41 [.26, .60] | .000 | .55 [.35, .84] | .000 |
| Hostility | → | Bullying victimization | .41 [.22, .63] | .000 | .34 [.16, .50] | .000 |
| Indirect effects | | | | | | |
| Mother attachment | → | Bullying perpetration | -.08 [-.13, -.02] | .013 | -.16 [-.27, -.09] | .000 |
| Father attachment | → | Bullying perpetration | -.10 [-.17, -.04] | .001 | -.07 [-.14, -.01] | .050 |
| Peer attachment | → | Bullying perpetration | -.09 [-.14, -.02] | .016 | -.07 [-.15, -.02] | .017 |
| Mother attachment | → | Bullying victimization | -.12 [-.18, -.05] | .001 | -.24 [-.39, -.16] | .000 |
| Father attachment | → | Bullying victimization | -.16 [-.25, -.12] | .000 | -.09 [-.19, -.01] | .033 |
| Peer attachment | → | Bullying victimization | -.10 [-.14, -.03] | .003 | -.14 [-.25, -.07] | .001 |

and a unique cognitive mechanism. While other related cognitions in the form of hostility appear to be a vehicle linking attachment to bullying perpetration, a combination of other and self-related cognitions explain the association between attachment and victimization. Furthermore, these findings can serve as a guide to improve existing prevention and interventions programs for traditional bullying. An important tenet of anti-bullying prevention and intervention programs might be targeting youth's negative automatic thoughts, particularly social threat and hostility thoughts. Previous research have shown the effectiveness of cognitive behavioural interventions for the prevention and remediation of specific behavioural and social problems among adolescents (Smith, Lochman, & Daunic, 2005). In addition to targeting cognitive factors in anti-bullying interventions, our results suggest that it may be also important to address parental and peer factors. This is in line with the social-ecological framework, which postulates that bullying is not just a simply dyadic problem, resulting only from individual characteristics of bully and victim, but it is also influenced by multiple relationships with family, peers or teachers (Espelage, Rao, & Rue, 2013). Another important consideration regarding our findings is that perceived attachment to parents and peers as well negative automatic thoughts, particularly hostility, appear to be shared risk factors for both bullying perpetration and victimization. Consequently, challenging negative automatic thoughts of hostility and improving quality of relationships with parents and peers would be shared intervention components implemented across both bully status groups, as well as suitable targets in universal prevention programs, whereas disputing social threat thoughts would be a unique component of programs for victims of bullying (Cook et al., 2010).

Several limitations of this study must be noted. First, the cross-sectional design of the study does not allow us to draw firm causal inferences about the relationships between parental and peer attachment, adolescents' negative automatic thoughts and their involvement in bullying behaviour. Indeed, previous studies indicate possible bidirectional effects between quality of peer relationships and bullying victimization (Pellegrini & Bartini, 2000). It is likely that adolescents with poor affective bonds with peers may be at risk for bullying victimization, but it is also possible that victimization experiences hinder the quality of future relationships with peers. Similarly, adolescents' distorted cognitions may function both as an antecedent and consequence of being the target of bullying (Calvete et al., 2018; Cook et al., 2010). Longitudinal studies are needed further to disentangle the direction of causality. Second, our data rely exclusively on self-report measures, which may result in under-reporting of behaviour. Victims are often reluctant to report bullying incidents as they fear retaliation, whereas perpetrators may fail to recognize their own behaviour as bullying perpetration (Newman & Murray, 2005). Future studies could involve collecting data through multiple informants, such as peers, teachers or parents. Furthermore, the current paper has focused on traditional forms of bullying. Despite considerable overlap between traditional and cyberbullying, future studies may examine whether the same mechanism explains the association between poor relationships with parents and peers and involvement in harassment via new virtual technologies. There is also a limitation regarding the instrument used to measure bullying, since APRI-BT does not capture all components of the definition of bullying such as power imbalance, intent to harm and repetition or potential for repetition.

## 3.4. Study 4. From Victims to Perpetrators of Bullying: The Role of Irrational Cognitions, Externalizing Problems and Parental Attachment

### 3.4.1. Introduction

Transition from victims of bullying to perpetrators is well documented in the literature (Chan & Wong, 2015; Haltigan & Vaillancourt, 2014). However, the mechanisms explaining how victims became perpetrators themselves received little attention, despite the severe long-term detrimental effects for this category of youths involved in bullying (Kochel et al., 2015).

Literature on consequences of victimization and antecedents of perpetration suggests several distinct potential pathways that could explain the link between bullying victimization and subsequent perpetration. One such plausible pathway is through the behavioural problems, which victims are likely to develop following exposure to bullying victimization (Ttofi et al, 2012). Indeed, numerous studies indicate that bullying victimization increases the risk of externalizing problems, such as conduct disorder and oppositional-defiant disorder (Ttofi et al., 2012). On the other hand, according to several meta-analyses conducted both on cross-sectional and longitudinal studies externalizing problems are one of the strongest predictors for involvement in bullying as a perpetrator (Cook et al., 2010; Natesan, Mitchell, Glover, 2018).

Evaluative cognitions or the way targets of bullying appraise the bullying incidents could be another factor that may account for the link between bullying victimization and perpetration (Cook et al., 2010; Fullchange & Furlong, 2016; Radliff et al., 2015). Bullying victimization had been consistently shown to impact the appraisals of the self, other and of the world (Fullchange & Furlong, 2016; Radliff et al., 2015). On the other hand, existing evidence emphasizes irrational cognitions as an antecedent to bullying perpetration behaviours (Cook et al., 2010; Sabanc & Çekiç, 2019). For example, the meta-analysis of Cook et al. (2010) showed that an irrational way of thinking characterized by negative global evaluations of others is a strong predictor for involvement in bullying as a perpetrator. In addition, amount of research has documented the role of irrational cognitions in the onset and maintain of youths' externalizing behaviours (Fives, Kong, Fuller, & DiGiuseppe, 2011; Silverman & DiGiuseppe, 2001). These findings together suggest that it is possible that bullying victimization does not operate exclusively through irrational cognitions or exclusively through externalizing problems to lead to further bullying perpetration, but, rather through the serial pathway where irrational cognitions serve as first mediator and externalizing problems as the second mediator.

However, not all children who are victims of bullying fall in the cascade of negative thinking and behavioural problems that would amplify the risk to become offender in the bullying dynamics. A protective factor that could interop the cognitive and behavioural mechanisms leading to bullying perpetration could be the parent-child attachment bond (Cole et al., 2010). Attachment to parents have been shown to be a significant factor impacting the cognitive lens through which youths interpret the world, as well as the behaviour that children enact (Abrams & Ellis, 1994; Kamkar, Doyle, & Markiewicz, 2012).

Building upon these previous findings, we aimed to conduct a preliminary study investigating the role of irrational cognitions and externalizing problems in accounting for the association between bullying victimization and bullying perpetration among adolescents. More specifically, using a cross-sectional design, a model with three alternative indirect pathways between bullying victimization and perpetration were considered – one through irrational

cognitions, one through externalizing problems, and one serial pathway through irrational cognitions leading to further externalizing problems. The conceptual model of the relationship between bullying victimization, bullying perpetration, irrational cognitions, externalizing problems is presented in Figure 5.

The second aim was to explore the moderating role of the type of parental attachment in the proposed model in explaining the association of bullying victimization and bullying perpetration. Considerable evidence points to potential differences between youths with a secure vs. insecure attachment bond towards parents in respect to the course of their well-being after being exposed to social adverse events such as peer victimization, with secure attachment mitigating the adverse outcomes associated with victimization (Cole et al., 2010). Therefore, it was hypothesized that type of attachment toward parents (secure vs. insecure) will moderate each of the indirect paths from the proposed model, such that each association between victimization and bullying via irrational cognitions, externalizing and the sequential path via cognitions and externalizing problems will be stronger for youths with insecure attachment, compared to those with secure attachment. The conceptual model of the moderated serial mediation is presented in Figure 6.

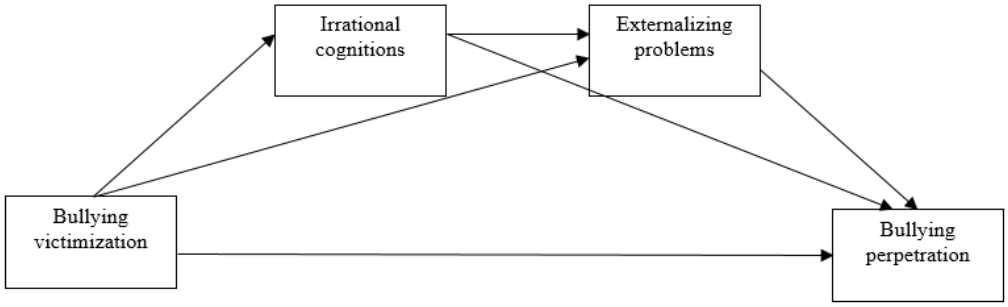


*Figure 5.* The conceptual model of the relationships between bullying victimization, irrational cognitions, externalizing problems, bullying perpetration

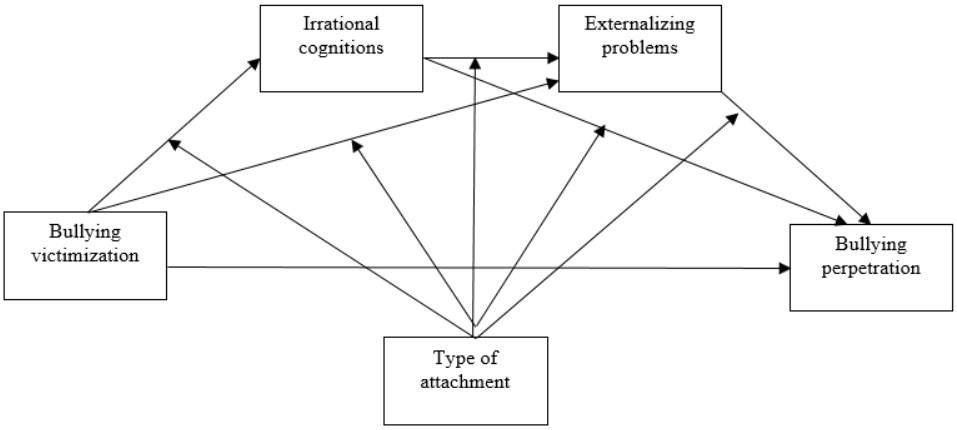


*Figure 6.* The conceptual model of the moderated serial mediation

### 3.4.2. Methods

#### 3.4.2.1. Participants

The sample for the current investigation comprised 269 adolescents (138 boys and 131 girls) aged 11 to 15 years, enrolled in middle public schools from Cluj-Napoca county. The mean age of the participants was 11.98 (SD=.68).

#### 3.4.2.2. Measures

The Adolescent Peer Relations Instrument, APRI-BT (Parada, 2000) is a self-report questionnaire designed to assess school bullying and victimization among adolescents aged 10-18 years. Higher scores on each subscale reflecting higher levels of bullying perpetration or victimization.

The Children and Adolescents Scale of Irrationality, CASI (Bernard & Cronan, 1999) is a self-report questionnaire assessing irrational cognitions in youths aged 10 to 17 years. Children are asked to rate on a 5 Likert-scale the extent to which they agree with 28 statements reflecting irrational cognitions.

Strengths and Difficulties Questionnaire-self report, SDQ (Goodman, 1997) is a 25-item screening instrument for emotional and behavioural problems among youths aged 4 to 17 years. SDQ comprises 5 subscales (Emotional problems, Conduct Problems, Hyperactivity, Peer problems and Prosocial subscale). The Conduct and Hyperactivity scale can be combined to obtain an externalizing problems score, whereas the emotional and peer problems scales yield an internalizing problems score. The scores for the Externalizing and Internalizing problems subscale ranged from 0 to 20, with higher scores reflecting higher emotional and behavioural problems. For the current study, only the externalizing problems subscale was used.

Experiences in Close Relationships Scale, ECR (Fraley, Heffernan, Vicary, & Brumbaugh, 2011) is a 9-item scale designed to assess the attachment styles towards various figures of attachment – parents, romantic partner, and best friend. For each figure of attachment, two scores are computed, one for attachment-related anxiety and one for attachment-related avoidance. For the purpose of the current study, 2 categories of attachment type towards parents were created, based on Fraley recommendations. Those with both anxiety and avoidance scores lower or equal to the median value (median anxiety = 1; median avoidance = 2.5) were assign to the secure group, whereas those having at least one dimension of attachment scores higher than the median were assigned to the insecure attachment group.

#### 3.4.2.3. Procedure

Several public schools were contacted to participate in the study. After the consent from schools' principals was obtained, parents were informed about the scope of the study through a leaflet and were asked to give informed consent for the children participation in the study. Questionnaires were administered during the classes, in the presence of a research assistant. The time required for the completion of the questionnaires was about 50 minutes.

#### 3.4.2.4. Data analyses

Path analysis with Mplus 8.1 (Muthén & Muthén, 2017), using Maximum Likelihood estimation method (ML), was conducted to test the indirect effects of bullying victimization on

bullying perpetration via irrational cognitions and externalizing. Next, a moderated path analysis was conducted in Mplus, in order to determine whether the indirect effects of victimization on perpetration via irrational cognitions and externalizing problems as well as the through the serial path with irrational as first mediator and externalizing problems as second mediator are moderated by the type of attachment toward parents. The moderation effects are considered to take place at each of the following paths: paths from predictor to M1, predictor to M2, from M1 to M2, from M1 to criterion and from M2 to criterion. In order to retain the assumption of the moderation, conditional indirect effects based on type of attachment for each the proposed paths have to be statically significant, such as the bootstrap confidence interval do not include zero (Hayes, 2013).

### 3.4.3. Results

#### 3.4.3.1. Path analysis

To investigate the interplay between bullying victimization, bullying perpetration, irrational cognitions and externalizing problems among adolescents, path analysis was conducted, with bullying victimization as predictor, bullying perpetration as criterion variable and, externalizing problems and irrationality as intervening variables. Inspection of the model fit indicators showed that the model is just-identified. Standardized bootstrap estimates of direct and indirect effects with 95% confidence intervals and significance test are shown in Table 6. All direct estimated paths were statistically significant. Bullying victimization was a significant predictor of youths' irrational cognitions ($\beta$ = .27, p <.01), externalizing problems ($\beta$ = .16, p <.05) as well as of bullying perpetration involvement ($\beta$ =.37, p <.01). Irrational cognitions had a direct effect both on externalizing problems ($\beta$ = .46, p <.01) and bullying perpetration ($\beta$ = .20, p <.01). Externalizing problems were a significant predictor for bullying perpetration ($\beta$ = .27, p <.01). All indirect effects were also statistically significant. Bullying victimization was indirectly related to bullying perpetration separately through youths' irrational cognition ($\beta$ = .05, p <.05) as well as through externalizing problems $\beta$ =.04, p <.05). The serial indirect pathway from victimization to perpetration through irrational cognitions leading further to externalizing problems was also significant ($\beta$ = .03, p <.01).

#### 3.4.3.2. Moderated path analyses

Next, a moderated path analysis was performed to test whether type of attachment towards parents, namely secure and insecure attachment, moderates the proposed indirect paths from bullying victimization to bullying perpetration. Type of parental attachment (secure vs. insecure) did not moderate neither the path from bullying victimization to irrational cognitions ($\beta$ = .09, 95% CI [-.13, .32], p =.51) nor to externalizing problems ($\beta$ = -.02, 95% CI [-.52, .05], p =.21), as suggested by the non-significant interaction terms. Similarly, type of attachment was not a significant moderator neither for the path from irrational cognition to externalizing problems ($\beta$ = .37, 95% CI [-.08, .90], p =.21), nor from irrationality to bullying perpetration ($\beta$ = -.37, 95% CI [-.79, .07], p =.15) nor from externalizing problems to bullying perpetration ($\beta$ =.-.02, 95% CI [-.15, .17], p =.83), since all the interaction terms were not statistically significant.

**Table 6**

*Standardized bootstrap estimates of direct and indirect effects with 95% confidence intervals and significance test for the model*

| | | | | Estimate [95%CI] | *p* |
|---|---|---|---|---|---|
| **Direct effects** | | | | | |
| Bullying victimization | → | Bullying perpetration | | .37 [.23, .59] | .00 |
| Bullying victimization | → | Irrational cognitions | | .27 [.18, .41] | .00 |
| Bullying victimization | → | Externalizing problems | | .16 [.95, .33] | .01 |
| Irrational cognitions | → | Externalizing problems | | .46 [.36, .62] | .00 |
| Irrational cognitions | → | Bullying perpetration | | .20 [.10, .37] | .00 |
| Externalizing problems | → | Bullying perpetration | | .27 [.18, .40] | .00 |
| **Indirect effects** | | | | | |
| Bullying victimization → | Irrational cognitions | | → Bullying perpetration | .05 [.02, .11] | .01 |
| Bullying victimization → | Externalizing problems | | → Bullying perpetration | .04 [.01, -.09] | .02 |
| Bullying victimization → | Irrational cognitions → | Externalizing problems | → Bullying perpetration | .03 [.01, .06] | .00 |

### 3.4.5 Discussions

The results of our study provide preliminary evidence for three potential pathways through which victims of bullying can become perpetrators – one through their irrational cognitions, one through externalizing problems and one through the chain from irrationality to externalizing problems. These results are in line with previous studies indicating that cognitive and behavioural factors are the most stable and salient mechanisms accounting for the victim-offender overlap among youths (Walters & Espelage, 2018). However, the moderation hypotheses were not supported, suggesting that a secure attachment toward parents do not necessary protect adolescents from developing the negative consequences associated with exposure to victimization that further put them at risk to bully others. A potential explanation for this result is suggested by the study of Schacter & Margolin (2019) which showed that parental support and emotional closeness do not compensate for adolescents' lack of daily positive meaningful peer relationships. In other words, when adolescents experience repeatedly negative interactions with peers, sometimes even on a daily basis, such as bullying victimization, parents are not able to compensate and fulfil the role

peers have in youths' life, compared to the situations when adolescents experience isolated, accidental negative interactions with peers, such as a simple conflict or misunderstanding (Schacter & Margolin, 2019).

Several theoretical and practical implications of the current investigation must be noted. From a theoretical point of view, the current study advances the current state of the art by providing a preliminary comprehensive model with potential to explain the processes though which victims adopt perpetration behaviours, with three alternative pathways accounting for the association between bullying victimization and perpetration. Using a serial two stage mediators approach allowed us to disentangle a complex model surrounding the trajectory from victim to victimizers of bullying – a cognitive path, a behavioural path, and a two-stage path from irrational cognitions to externalizing problems. In addition, the fact that all the three alternative pathways were significant emphasizes the heterogeneity of the victim-bullies profiles, which is in accord with the recent studies questioning the homogeneity of bullies and victims characteristics (Eastman et al., 2018). From a practical point of view, the findings of the present study call for the need of assessment of irrational cognitions and behavioural problems among victims of bullying, in order to identify the victims at risk for becoming victimizers as well as the profiles of mechanisms for each bullied adolescent. Second, the results of the current study provide some preliminary evidence with respect to putative mechanism that could be targeted in the prevention and intervention programs for victims of bullying. Reducing childhood behavioural problems or/and irrational cognitions should be critical components of the interventions for victims of bullying, that could reduce the risk of victimized youths to become bullying perpetrators. For example, Markopoulos and Bernard (2015) found that a short cognitive behavioural intervention addressing irrational cognitions dysfunctional overt behaviours reduced the irrationality and improved the coping strategies among youths victims of bullying (Markopoulos & Bernard, 2015). By promoting a rational evaluation of situations and effective behavioural coping strategies, as opposed to externalizing problems, such intervention programs not only will mitigate the negative emotional consequences of bullying on but also could prevent victims to make the transition to the bullying perpetrator role (Fung, 2012). Third, by depicting three alternative pathways through which targets of bullying may become bullies, the current study points to the need of tailoring prevention and intervention programs for interrupting the vicious cycle of victimization – perpetration, based on the constellation of the mechanisms identified – either high levels of irrationality or externalizing problems only, either higher levels of both cognitions and behavioural problems.

The findings of the present study must be interpreted in t the light of several limitations. The cross-sectional nature of the data precludes us to determine the causality between variables. However, the preliminary results coming from the current cross-sectional study, regarding the role of youths' irrationality and externalizing problems in explaining the association between bullying victimization and perpetration, call for the need to conduct future longitudinal studies, in order to confirm the temporal sequences of mediators as proposed by our study. For example, it would be interesting to examine whether the same pathways operate to explain the reversed transition, from perpetrators to victims, which is also documented in the bullying dynamics, although less

frequently (Baker et al., 2008). In addition, the direct effect of bullying victimization on perpetration remained significant after the introduction of the two mediators in the model, suggesting that there might be other variables that explain the association between the two roles of bullying. Indeed, our study focused only on cognitive and behavioural pathways, while the affective constructs (e.g., anger, depression) could also play an important role in explaining how targets of bullying become perpetrators (Camodeca & Goossens, 2005; Walters & Espelage, 2018).

# CHAPTER IV. GENERAL CONCLUSIONS AND IMPLICATIONS

## 4.1. General Conclusions

The general purpose of the present thesis was to investigate the effectiveness of prevention programs and the mechanisms underlying bullying behaviours among youths through the lens of a multilevel approach, based on the social-ecological model. As a secondary aim, we aimed to improve the methodology employed in the field of bullying research.

The first step was to provide a comprehensive overview on the effectiveness of the multilevel programs in preventing bullying and cyberbullying among children and adolescents, by conducting a meta-analysis of randomized controlled trials (Study 1)

The results of the meta-analyses indicated that the existing multilevel programs are effective in preventing bullying perpetration, both on short and long term, but the magnitude of the effect was small. For preventing bullying victimization, delayed effects of the programs were detected – there was a significant effect of prevention programs on bullying victimization only at follow-up, but not immediately after the completion of the program. When sensitivity analyses were performed for prevention programs with and without a parental component, our results pointed out that only programs including parents were successful in preventing bullying perpetration, both on short and long-term, whereas for bullying victimization the parental involvement made a positive difference on the long-term. The impact that parental involvement made in the prevention programs for bullying stresses once again the importance of a multilevel approach in understanding and preventing bullying (Espelage & Swearer, 2010; Swearer & Hymel, 2015). With respect to online bullying, the prevention programs did not produce a significant effect nor on cyberperpetration nor on cybervictimization. These less optimist findings for the prevention of cyberbullying could be due to the insufficient tailoring of these programs to address the specific mechanisms underlying bullying perpetrated through technology (Cross et al., 2015). Subsequently, moderator analyses showed that programs lasting 6 months or less tend to produce better effects for bullying perpetration compared to programs with a longer duration. Differences in the effect sizes for bullying perpetration post-intervention were also found between studies conducted by independent researchers and studies that included the developers of the program among authors, with a higher effect size for the second category. Quality of the studies was also a significant moderator of the effect size for bullying perpetration at follow-up – higher quality of the studies was associated with lower effect sizes. These two results raise questions about the reliability of the conclusion regarding the effectiveness of the anti-bullying prevention programs.

Next, a methodological study (Study 2) was conducted aiming to adapt and test the factorial structure and the measurement invariance across age, gender, and clinical status of Adolescent Peer Relationships Instrument – Bully/Target (APRI-BT), a multidimensional questionnaire assessing bullying perpetration and victimization among pre-adolescents and adolescents (Parada,

2000). The confirmatory factorial analyses result from Study 2 indicated that the second order structure of the APRI-BT with a six first-order factor structure and two second order factors (Bully including Bullying Physical, Bullying Verbal, Bullying Social and Victim including Physical Victimization, Verbal Victimization, Social Victimization) proposed by the authors of the scale was also supported in a Romanian sample. Further, measurement invariance for the APRI-BT, across boys and girls, younger and older children as well as across clinical and non-clinical samples was demonstrated.

After having a scale with strong psychometric proprieties and evidence from the meta-analysis supporting the importance of targeting multiple levels (especially parental factors) in the anti-bullying prevention programs, we conducted further a cross-sectional study following the multilevel approach, in which we investigated the role of parental and peer factors attachment and individual cognitive factors in predicting bullying perpetration and victimization among adolescents. More specifically, we examined the indirect effects of attachment to mother, father and to peers on bullying victimization and perpetration through adolescents' negative automatic thoughts. The results showed that poor attachment bonds with mothers, fathers and peers are negatively associated with youths' negative automatic thoughts, which further predict higher frequency of both bullying perpetration and victimization. In addition, when we explored the role of the specific contents of the negative automatic thoughts in the relationship between attachment to parents and peers and bullying involvement, hostility thoughts emerged as the only intermediate between attachment to each of the three figures of attachment and bullying perpetration whereas a combination of hostility and social threat thoughts was relevant in explaining the association between attachment and bullying victimization.

In the fourth study, we conducted a preliminary analysis on the explanatory role of irrationality and externalizing problems in the dynamic relationship between bullying victimization and bullying perpetration. More specifically, we tested a model of an indirect serial pathway from bullying victimization to bullying perpetration through cognitive factors (irrational cognitions) and behavioral factors (externalizing symptoms). In addition, we tested whether the pathways operate the same for youths with secure versus secure parental attachment. All the three indirect pathways were significant in explaining the association between bullying victimization and bullying perpetration: path 1 – via irrational cognitions; path 2 – via externalizing problems; path 3 – via irrational cognition as first mediator and externalizing problems as second mediator in the chain. On the other hand, contrary to our predictions, the type of attachment toward parents did not moderated the indirect effects of bullying victimization on bullying perpetration, neither through the level of irrationality nor through externalizing problems, nor through the serial link from irrational cognitions to externalizing problems. We can conclude that a secure emotional bond toward parents do not necessary protects the victims from developing maladaptive cognitive evaluations and externalizing problems, and indirectly from becoming further involved in bullying as perpetrators.

## 4.2. Implications of the Thesis

### 4.2.1. Theoretical Implications

The theoretical implications of the present thesis were the primary output of study 3 and study 4, which aimed to advance the understanding of mechanism involved in bullying perpetration and victimization by adopting a multilevel approach. Study 3 was the first attempt in the empirical literature to model the indirect effects of attachment to mother, father and peers on bullying victimization and perpetration via adolescents' negative automatic thoughts. This study prompts the understanding of potential mechanism behind bullying behaviours among adolescents by integrating individual (cognitions) and interpersonal factors (parental and peer quality of attachment). The findings of the study 3 indicate common as well unique underlying processes across both bullying victimization and perpetration. Since some adolescent with poor attachment relationships may come to engage in bullying as perpetrators, while others are more likely to become targets of bullying, attachment to significant others could represent a distal transdiagnostic risk factor, that leads to multiple distinct outcomes, whereas negative inferential cognitions may be the proximal transdiagnostic risk factor that explain the relationship between poor attachment and bullying perpetration as well victimization, and that launch youths with problematic attachment on pathways that are related to various maladaptive outcomes (Ein-Dor & Doron, 2015). However, when we look at the specific contents of negative automatic thoughts, our results provide preliminary evidence for both a shared and a unique cognitive mechanism. Hostility thoughts act as a shared cognitive mechanism in the link between attachment and bullying perpetration as well as victimization, whereas social threat automatic thoughts are relevant only in explaining the relationship between attachment and bullying victimization.

In study 4, we advance the fundamental research in the domain of bullying by using the multilevel approach in understanding the transition from bullying victimization to bullying perpetration. This study provides preliminary insights into a potential complex mechanism explaining how bullying victimization is associated with further bullying perpetration. More specifically, we identified three potential pathways explaining the association between bullying victimization and bullying perpetration – one through youths' irrational cognitions, one through externalizing problems and one serial pathway from irrational cognitions leading to externalizing problems and further to bullying perpetration. Study 4 also uses a multilevel approach by exploring the role of type of attachment towards parents as a potential protective factor in interupting the pathways from victims to victimizers. The moderation hypotheses were not supported, suggesting that secure emotional bonds between youths and their parents do not protect victims to fall into the negative cycle of irrational evaluation and behavioral problems, which finally put them at risk to become perpetrators of bullying.

### 4.2.2. Methodological Implications

The methodological advances were the primary outputs of the first two studies. Study 1 was the first meta-analysis quantifying the overall effect sizes of the multilevel programs in preventing bullying and cyberbullying among children and adolescents. Through Study 1 we also addressed some major methodological limitations of the previous meta-analysis on the topic. First, we evaluated the overall effects of prevention programs for bullying not only immediately after the completion of the programs, but also at follow-up. This is the first meta-analysis in the field of anti-bullying programs research that performed separate analysis depending on the timepoint when the outcomes of interest were assessed, offering a refined methodological approach in conducting future meta-analyses on the effectiveness of bullying prevention or intervention programs. In addition, the potential delayed effects of prevention programs on bullying victimization documented by our meta-analysis emphasize the need that future evaluation studies to conduct follow-up assessments before drawing conclusions about the effectiveness of a program in preventing bullying victimization. Second, through our meta-analysis, we provide an overall effect of prevention programs with and without parental involvement also on short and long-term. Again, in this way, we advanced the methodological approach in how to quantify the effects of multi-systemic prevention programs.

Through the study 2, our work contributes to the field of evidence-based assessment of bullying. By confirming the factorial structure and by documenting the measurement invariance across gender, age, and clinical status of the APRI-BT, we validated in Romanian language an instrument that measure bullying perpetration and victimization along with the three specific forms of this behavior. Our study also provides a strong psychometric basis for meaningful comparisons across different populations with respect to bullying behaviors. APRI-BT can be used to compare boys and girl, younger and older children as well as community and clinical samples both on general bullying and victimization involvement and on specific types of bullying behaviors, ruling out the possibility that the differences in the frequency of general and specific types of bullying and victimization are accounted by measurement artefacts. The present study also responds to the need of a unitary assessment strategy for bullying behavior, in order to assure the comparability of bullying prevalence across different countries (Modecki et al., 2014).

### 4.2.3. Practical Implications

Through the findings from the study 1, we provide valuable insights that could guide practitioners, policymakers, and stakeholders in the decision-making process with respect to the selection and implementation of prevention programs for bullying and cyberbullying. More specifically, social-ecological based prevention programs, targeting multiple levels, are effective in preventing especially bullying perpetration, prompting the practitioners and policymakers to adopt and implement prevention programs guided by this theoretical approach. In addition, by documenting delayed effects of prevention programs on bullying victimization, we draw attention to the need to enhance the existing programs by adding a component targeting the specific mechanisms involved in bullying victimization, in order to accelerate the gains for youths that are at risk to become victims of bullying. Also, our meta-analysis could prompt the clinical practice

and the anti-bullying policies to involve parents in the efforts to prevent bullying and to select and implement short prevention programs, lasting no more than 6 months. The finding related to the optimal duration of the prevention programs is especially important because, at the moment, most of the prevention programs included in the anti-bullying schools or national policies have longer duration, of at least 1 year or even more (Gaffney et al., 2019). This raises questions about the balance of costs and benefits, showing that engaging more time resources as well as personal and financial resources in the prevention programs for bullying doesn't improve the outcomes. Finally, the less optimistic results concerning cybebullying outcomes also represent valuable information for policy makers and stakeholders, since they raise awareness concerning their limited effectiveness.

Through the study 2 we provide practitioners from clinical practice and from schools with a multidimensional instrument assessing youths' bullying involvement as perpetrator and victims. At the national level, this aspect is critical given the recent enactment of the national anti-bullying law, calling for the assessment of bullying in schools and accurate identification of perpetrators and victims of bullying, as a first step in the management of bullying behaviours.

The findings from study 3 and 4 also have potential practical implication, by providing insights for practitioners with respect to the potential mechanisms that should be targeted at multiple levels in the prevention and intervention programs for bullying behaviours. More specifically, the results of the study 3 show that when implementing prevention or intervention programs for bullying, improving the quality of attachment bonds with both parents as well as with peers and cognitive restructuring of hostility thoughts should be a common component of the programs for both those being at risk to become perpetrators and victims or those who already are victims and bullies, whereas modifying the negative automatic thought of social threat should be addressed only in relation to bullying victimization. Moreover, through study 4, we showed which mechanisms should be addressed for those being victims of bullying in order to prevent their transition to bullying perpetrators. Study 4 indicates that cognitive factors in the form of irrational thinking as well as externalizing problems should represent core targets of indicated interventions for victims of bullying. However, our preliminary evidence from Study 4 suggests that strengthening the emotional bond with parents should not necessarily be seen as an essential component of the programs aiming to disrupt the transition from victim to perpetrators.

### 4.3. Limitations and Future Directions of Research

Although the present thesis made important contribution at theoretical, methodological, and practical level, there are several limitations that should been considered when interpreting the main findings. In the first study, the overall effect size for multilevel prevention programs on cyberbullying perpetration and victimization among youths was based on a small sample of primary studies (n=5). However, this aspect is due to the stringent inclusion criteria, since we opted to include in the meta-analysis only studies using the most rigorous design – randomized controlled trials. Moreover, although significant heterogeneity was documented among the effect sizes, only

a few moderating variables were able to explain the high heterogeneity. Despite preliminary evidence coming from empirical studies emphasizing that variables such as the proportion of boys vs. girls in the sample or the informants for assessing bullying (youths, peer, parent, teachers) could impact the effect of anti-bullying programs, we were not able to include these moderators in our analysis, because insufficient data reported in the primary studies (Slattery, George, & Kern, 2019; Vivolo-Kantor et al., 2014). It is also important to mention that the primary studies included in the meta-analysis had a high risk of bias. In the meta-regression analyses, the risk of bias of the primary studies was negatively associated with the effect size for bullying perpetration outcome, in that the effect size of the prevention programs decreased as the quality of the studies increased. This raise questions about the reliability of the conclusions we draw regarding the real effectiveness of anti-bullying prevention programs. Therefore, it is imperative that future studies conduct evaluation studies in which the risk of bias is minimized as much as possible.

Another major limitation concerns the cross-sectional design used in study 3 and 4 to test indirect effects that preclude us to draw firm conclusions with respect to the causal relationships hypothesized. Therefore, future studies should use a longitudinal design to better capture the directions of the relationship between parental and peer attachment, negative automatic thoughts and involvement in bullying perpetration and victimization. Similarly, the dynamic transitions between bullying victimization and perpetration and the mechanisms explaining this transition could benefit from using repeated measurement over time in order to clarify the temporal sequence of the proposed mechanisms in the dynamic between roles. The cross-sectional nature of the study is also a limit for study 2, precluding us to make inferences about the scale's accuracy when assessing bullying and victimization over time. Therefore, future research should investigate the longitudinal invariance of Romanian version of APRI-BT.

In study 3 and 4 we focused on the role of attachment to parents and peers, negative automatic thoughts, and irrational cognitions as well as externalizing problems in bullying involvement. However, an important future line of research would be to investigate from a multilevel perspective other parental factors such as parenting behaviours or parental psychopathology as distal risk factors, as well as other proximal individual cogntive (e.g., self-serving cognitions or implicit cognitions) and affective factors (e.g., anger, anxiety, depression, guilt) for explaining youths bullying behaviours (Cook et al., 2010; Lereya et al., 2013). In addition, it would be interesting for future research to expand the investigation of the models tested by us in study 2 and 3, by integrating risk or protective factors from the other levels of the system where bullying happens, such as school or community factors. For example, it has been consistently shown that the quality of relationship between students and teachers predicts the frequency of bullying behaviours (Bacchini et al., 2009). Therefore, an important avenue for future research would be to examine whether a good quality of relationship between students and teacher would protect those youths at risk because of the individual and parental vulnerabilities to become perpetrators or targets of bullying.

## 4.4. Summary of General Conclusions

Based on the studies of the current thesis and the limitations acknowledged previously, several general conclusions can be drawn:

1) The current status of the existing multilevel programs in preventing face to face bullying among children and adolescents is at least encouraging. Anti-bullying programs are effective in preventing bullying perpetration immediately after the completion of the programs and these effects are sustained at follow-up, whereas for bullying victimization the effects were documented only at follow-up, but the magnitude of the sizes was small. Less promising results were found with respect to current effectiveness of prevention programs on cyberbullying perpetration and cybervictimization on short-term. More specifically, there was no differences post-intervention between experimental and control groups for cyberbullying outcomes.

2) However, a promising direction in improving the current status of existing multilevel prevention programs lies in the involvement of parents in program for preventing face to face bullying perpetration and victimization, since the programs with a parental component were superior to the programs without a parental involvement, especially on long-term.

3) Programs lasting 6 months at most produce higher effects in prevention of bullying perpetration, compared to longer programs. Therefore, shortening the duration of the prevention programs would lead to benefits not only with respect to the effect sizes but as well as on the financial and staff resources spent on the implementation of these programs.

4) The Romanian version of the Adolescent Peer Relationship Instrument – Bully/Target proved to be invariant across gender, age, and clinical status. This implies that latent factors, factor loading's and latent means are similar across boys and girls, younger and older children as well as across clinical and non-clinical samples. Therefore, APRI-BT can be used to conduct valid comparisons across these groups, by assuring that the potential observed differences in the frequency of bullying reflect real differences and are not due to the measurement artefacts.

5) Parental and peer attachment is indirectly linked to youths' bullying perpetration and victimization through youths' negative automatic thoughts. In other words, the quality of attachment to mother, father and peers impacts the way youths think about themselves, others, and the world, which further put them at risk to engage in bullying behaviors both as victims and perpetrators.

6) The specific contents of youths' negative automatic thoughts are relevant in differently explaining the association between attachment to each mother, father and peers and bullying perpetration on one hand, and bullying victimization, on the hand. Only hostility emerged as a significant pathway from attachment to bullying perpetration, whereas a combination of hostility and social threat thoughts explained the association between attachment and bullying victimization.

7) Irrational cognitions and externalizing symptoms are a potential mechanism in explaining the transition from the role of victims of bullying to perpetrators, each separately as well as a serial path from irrational cognitions leading further to externalizing problems. If in study 3 we demonstrated that attachment toward parents is important in predicting occurrence of bullying behaviours, in study 4 we showed that parental attachment has no impact on the indirect pathways that explained the transition from bullying victimization to bullying perpetration.

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