**The Role of Metacognitions and Thinking Styles in the Negative Outcomes of Adolescents’ Peer Victimization**

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**Abstract**

Psychological mechanisms that may explain the link between peer victimization and its adverse outcomes are still understudied. The current study aimed to apply the Self-Regulatory Executive Function (S-REF) model of psychopathology (Wells & Matthews, 1994; 1996) to help explain this link in a sample of adolescents. A total of 1169 Italian adolescents (47.7% females; *Mage*=15.79, *SD*=1.07) completed self-report measures of peer victimization, metacognitions, thinking styles (worry and rumination), and adjustment indices (somatic symptoms, anxiety, depression). The hypothesized model based on the S-REF model was tested through path analysis. Results confirmed that peer victimization was positively associated with both positive and negative metacognitions that, in turn, were linked to worry and rumination, which were associated with higher psychological and somatic problems. The strongest indirect links were found between peer victimization and anxiety via negative metacognitions and worry, and between victimization and depression via negative metacognitions and rumination. Overall, the results support to the application of the S-REF model to peer victimization experiences during adolescence. The clinical implications of these findings are discussed.

**Key words:** worry, rumination, metacognitions, depression, anxiety, somatic problems

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Peer victimization is one of the most common interpersonal stressors that students experience during their school careers, especially during adolescence. Large-scale, cross-national studies have estimated that about one-third of youth are involved in some forms of victimization by peers (Due et al., 2005; Molcho et al., 2006; Nansel, Craig, Overpeck, Saluja, & Ruan, 2004). Peer victimization can take various forms, both direct/overt and indirect/relational, including physical assaults, verbal harassment, threatening behavior, or it can involve psychological and social strategies (e.g., exclusion, rumor spreading) (Crick, Casas, & Ku, 1999). Although a long tradition of empirical studies has established the negative consequences of peer victimization (Casper & Card, 2017; Gini, Card, & Pozzoli, 2018; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Ttofi, Farrington, Losel, & Loeber, 2011; Van Geel, Vedder, & Tanilon, 2014), this field of research still lacks a theoretically grounded, systematic focus on the psychological mechanisms and processes that may explain the link between this negative interpersonal experience and its negative outcomes in adolescents’ lives. Understanding these mechanisms is important for the development of prevention and intervention programs able to lessen the suffering of victimized youth.

**Peer Victimization and Psychological and Somatic Problems**

Consistent with stress-health models (e.g., Bonanno & Hymel, 2010; Flack, Salmivalli, & Idsoe, 2011; McEwen, 1998; Swearer & Hymel, 2015), research has confirmed that peer victimization is a stressful life experience that is negatively associated with targets’ adjustment and well-being. Specifically, youth who are victimized by peers suffer from a variety of internalizing problems, among which anxiety and depression have been the most widely studied (e.g., Casper & Card, 2017; Gini et al., 2018; Reijntjes et al., 2010; Ttofi et al., 2011). Moreover, targets of peer aggression report frequent somatic problems, such as headaches, stomach aches, muscle pains, dizziness, and several other health problems (Gini & Pozzoli, 2009, 2013; Gini, Pozzoli, Vieno, & Lenzi, 2014). These problems have been also referred to as “psychosomatic problems” (Gini & Pozzoli, 2009) because psychosocial processes seem to act as a key factor negatively affecting youth’s health. These psychological and health consequences of childhood and adolescence victimization have been shown to persist into adulthood (Copeland, Wolke, Angold, & Costello, 2013; Kerr, Gini, & Capaldi, 2017; Takizawa, Maughan, & Arseneault, 2014).

Compared to the large number of studies that have assessed the negative correlates of peer victimization, surprisingly few of them have tried to identify the psychological mechanisms that may play a role in the association of adolescents’ peer victimization experiences with mental health and, even more apparently, with somatic problems. With reference to general models of coping, some studies have analyzed the coping strategies adopted by victimized youth. Overall, targeted youth tend to show passive, emotionally-oriented and avoidant coping styles, which are considered to be maladaptive styles and have been shown to be related to poor mental health (Bitsch Hansen, Steenberg, Palic, & Elklit, 2012). Other studies, however, have also found that even victims who used problem-focused strategies reported they still felt ineffective in solving their problems (Tenenbaum, Varjas, Meyers, & Parris, 2011). In sum, authors have claimed that inability to effectively handle peer victimization may compromise adolescents’ emotion regulation (Rudolph, Troop-Gordon, & Flynn, 2009) and lead to psychological maladjustment, including in particular depressive symptoms (Hanish & Guerra, 2002; Keenan, Hipwell, Feng, Rischall, Henneberger, & Klosterman, 2010; Prinstein, Boergers, & Vernberg, 2001).

Other researchers have more specifically focused on the role of cognitive regulation strategies that people use to manage stressful information and events (Garnefski, Kraaij, & Spinhoven, 2001). Some of the most common strategies include self-blaming, rumination, and catastrophizing that make people more vulnerable to emotional problems (Garnefski & Kraaij, 2014). In the case of peer victimization, the more victims believe the cause of victimization to be internal, and thus tending to blame (at least partially) themselves for victimization, the more the experience of being repeatedly victimized becomes stressful and more likely to lead to stress-related health problems (McDougall & Vaillancourt, 2015; Swearer & Hymel, 2015). Literature has indeed showed that such maladaptive attributional style is negatively associated with adjustment and well-being, for example with increased depressive thoughts and feelings of low self-worth (Graham & Juvonen, 1998).

Similarly, rumination has been proposed as a potential mechanism that increases the likelihood of being depressed after negative events by reducing active problem solving (Nolen-Hoeksema & Morrow, 1991). Indeed, being insulted, threatened, or excluded from the peer group may increase targets’ propensity to ruminate rather than actively doing something to stop the victimization that may, in turn, lead to depression (Barchia & Bussey, 2010). Although little research has explored the role of rumination in explaining the association between peer victimization and depression, studies on other forms of abuse have in fact reported that rumination mediated the link between victimization and depression (Conway, Mendelson, Giannopoulos, Csank, & Holm, 2004). Adolescents who are frequently harassed by peers may ruminate extensively about their poor relationships with peers and be preoccupied with being accepted and fitting in. This distress with peer relationships would then contribute to internalizing problems, such as depression, anxiety, and withdrawal (Crick, Grotpeter, & Bigbee, 2002; Rudolph & Clark, 2001; Troop-Gordon & Ladd, 2005).

On the other hand, victimized youth often show increased perceived risk of victimization, which, in turn, increases fear of victimization in terms of fear at school (Bachman, Randolph, & Brown, 2011; May & Dunaway, 2000; Swartz et al., 2011), diminished sense of safety at school (e.g., Gini, Marino, Pozzoli, & Holt, 2018), and fear going to and from school (Bachman et al., 2011). More generally, youth who are more vulnerable to victimization are more likely to experience fear of crime (Ferraro, 1995; Hale, 1996). Victimization and fear of victimization may therefore increase worrying thoughts, that is, intrusive thoughts about what may happen in the near future; worry, in turn, may exacerbate victims’ anxious feelings.

Though quite limited in number, this line of research has merits in that it has contributed to shed some light on the types of thinking styles elicited by experiences of victimization and the role these may play in linking peer victimization to psychological and health problems during adolescence. However, researchers and clinical psychologists would benefit from a more thorough analysis of what psychological processes come into play is such negative life circumstances based on established clinical theories of psychological problems (Wells & Matthews, 1994; 1996). Previous studies have also been limited by the fact that they almost exclusively focused on depressive symptoms reported by victimized youth. In the current study we aimed to expand the analysis of the psychological mechanisms that may link adolescents’ peer victimization to a set of three different problems, namely anxiety, depression, and somatic problems (Casper & Card, 2017; Gini & Pozzoli, 2013; Reijntjes et al., 2010; Ttofi et al., 2011). The theoretical model we adopted for understanding these psychological mechanisms is the Self-Regulatory Executive Function (S-REF) model of psychopathology developed by Adrian Wells and Gerald Matthews (1994; 1996).

**The S-REF Model of Psychopathology**

Briefly, the S-REF model of psychopathology (Wells & Matthews, 1994; 1996) emphasizes the role of processes and metacognitive beliefs implicated in problem maintenance, rather than focusing only on the content of thoughts and stressful experiences. This model, specifically, proposes that psychological distress is exacerbated and maintained by a style of coping with thoughts and emotions that involves perseverative thinking (e.g., worry and rumination), threat monitoring, avoidance, and thought suppression. Worry refers to a chain of negative thoughts, often in the form of “what if” questions, that are future-oriented, directed at anticipating danger and planning ways to avoid it, and involve catastrophizing. Rumination refers to the attempt to answer questions about the meaning of negative events (i.e., “why” questions), it is aimed at understanding the reasons for negative emotions and finding out ways of dealing with distressing feelings. Both worry and rumination are voluntary, but often experienced as difficult to control. This style of coping is termed the Cognitive Attentional Syndrome (CAS) and it becomes problematic, once activated, because it causes negative thoughts and emotions to persist and become perseverative (Wells, 2000, 2009).

According to the S-REF model the CAS is derived from underlying metacognitions, which are beliefs we hold about our cognition and strategies that impact on it (Wells, 2000). This form of knowledge provides plans for guiding processing, the rules of which may be more (explicit) or less (implicit) amenable to conscious awareness and verbal expression. Metacognitions take two forms: positive and negative. Positive metacognitions motivate the use of the CAS. They include beliefs such as: “Worry will help me be prepared” or “If I ruminate, I will be able to understand”. Negative metacognitions concern the significance, uncontrollability and danger of thoughts. Examples of these include: “I need to control my thoughts at all times” or “My thoughts may make me lose my mind”.

In the last two decades, the S-REF model has been widely applied with both adolescents and adults and has led to the development of disorder-specific formulations and treatments for alcohol misuse (Spada, Caselli, & Wells, 2013; Spada, Caselli, Nikčević, & Wells, 2015), depression (Wells, 2009), generalized anxiety disorder (Wells, 1995), obsessive-compulsive disorder (Wells, 2000; Wells & Matthews, 1994), post-traumatic stress disorder (Wells, 2000; Wells & Sembi, 2004), and social anxiety disorder (Clark & Wells, 1995). Metacognitive therapy, the psychological treatment based on the S-REF model, has been extensively evaluated across a series of studies with preliminary results indicating superior outcomes to cognitive behavioral therapy (Normann, van Emmerik, & Nexhmedin, 2014; Wells, 2013).

**The Current Study**

To date, no attempt has been made to explain the link between peer victimization and adolescents’ psychological and health problems with the S-REF model investigating the possible associations between peer victimization, metacognitions, perseverative thinking and negative outcomes experienced by adolescents. The central tenet of the S-REF model is that negative thoughts and emotions triggered by stressful life experiences should persist and become perseverative through the activation of the CAS; the latter being driven by the presence of metacognitions (Wells, 2000, 2009). This line of reasoning suggests that it is plausible to assume that negative thoughts and emotions experienced as part of being victimized by peers (the stressor) may result in negative outcomes through the activation of the CAS (rumination and worry) driven by metacognitions. The current study, therefore, proposes and tests a model (illustrated in Figure 1) in which peer victimization is associated to both positive and negative metacognitions that, in turn, are associated to both rumination and worry leading to negative outcomes. The central aim of testing this model is to examine whether the identified psychological mechanisms do indeed mediate the relationship between peer victimization and negative outcomes. If they were to, it would possibly entail developing intervention packages that target these psychological constructs which may lie at the core of the perseveration of negative outcomes as a consequence of peer victimization.

This model was specifically tested with adolescents because this is a developmental period when, in general, internalizing problems tend to increase (e.g., Costello & Angold, 1995) and when social-relational stressors are crucial for the appearance of adjustment problems (Compas, Hiden, & Gerhardt, 1995). In adolescence, peer victimization more clearly assumes a key role for identity development and the social and psychological adjustment of those who are frequently targeted by peers (Hjern, Alfven, & Östberg, 2008; Troop-Gordon, 2017), and adolescents show heightened physiological and affective responses to rejection by peers and social exclusion (Troop-Gordon, 2017). Finally, it has been showed that adolescents’ metacognitive beliefs and perseverative thinking styles are fully developed by the age of 13 and can be reliably assessed in adolescence (Bacow, Pincus, Ehrenreich, & Brody, 2009). In fact the S-REF model has been previously successfully applied to adolescents’ psychopathology (e.g., Cartwright-Hatton, Mather, Illingworth, Brocki, Harrington, & Wells, 2004; Debbané, Van der Linden, Balanzin, Billieux, & Eliez, 2012; Esbjørn, Lønfeldt, Nielsen, Reinholdt-Dunne, Sømhovd, & Cartwright-Hatton, 2015).

Finally, previous research has repeatedly found gender differences in several of the variables tested in our model, such as frequency of peer victimization (more often higher in males; Nansel et al., 2001; Vieno, Lenzi, Gini, Pozzoli, & Cavallo, 2015), levels of reported psychological and somatic problems (usually higher in females; Lenzi et al., 2013; Vieno, Gini, Lenzi, Pozzoli, Canale, & Santinello, 2015), and worry and rumination (higher in females; Johnson & Whisman, 2013; Robichaud, Dugas, & Conway, 2003). Even though addressing gender differences was not a primary aim of the present study, after testing for the validity of the S-REF model in the whole sample, we explored whether gender groups differed in any of the tested associations.

**Method**

**Participants and Procedure**

A sample of 1375 adolescent students from public secondary schools in a Northern-East region of Italy was asked to voluntarily participate in the study. Permission was sought from the school principals and signed active consent was obtained from the 85.02% of the students’ parents. The final sample therefore consisted of 1169 students. The participants (47.7% females) ranged in age from 14 to 17 years (*M*=15.79, *SD*=1.07). Socioeconomic status was not directly measured. However, as in all public schools in Italy, our sample included students from a wide range of socioeconomic backgrounds.

All anonymous responses to the self-report instruments were collected during a regular school-day in school computer rooms and in the presence of the class teacher, from January to March 2017. Prior to data collection, participants were assured confidentiality and they were told that they could withdraw from the study at any time with no consequences. After completing the questionnaires, students were thanked for their participation in the survey and researchers answered any students’ questions. The research protocol was approved by the Ethics Committee for Psychological Research at the University of Padova, Italy.

**Measurement of Study Variables**

Although we employed scales that have been previously used and validated, a confirmatory factor analysis (CFA) was performed to test for the construct validity of each measure in the current sample. Analyses were performed in Mplus 8 (Muthén & Muthén, 1998-2017), with the WLSMV estimator (Jöreskog & Sörbom, 1993). Because students were nested within classrooms, the “Complex” feature of Mplus was used to estimate robust standard errors and take into account the non-independence of the data. The following indices were used to evaluate the fit of a model: Comparative-Fit Index (CFI); Tucker Lewis Index (TLI); and Root Mean Square Error of Approximation (RMSEA) (e.g., Browne & Cudeck, 1993; Hu & Bentler, 1999). Reliability of scale’s scores in the current sample was also computed as Cronbach’s alpha, with its relative confidence interval (95% CI).

**Peer victimization.** Victimization by peers was measured with an Italian scale composed of 12 items (Gini, 2008a). Participants were asked to rate the frequency with which they received each aggressive behavior from peers (e.g., threatening, excluding from the group, spreading rumors) during the current school year. The items were rated on a 5-point scale (from (1) “never” to (5) “almost always”). The 1-factor CFA confirmed an adequate fit between the model and the data: χ2(50) = 398.27, *p*< .001; CFI= .93; TLI = .91; RMSEA = .077, 90% CI [.070, .084]. The scale has previously showed good reliability with Italian adolescents (Gini, 2008a). The Cronbach’s alpha for the scale in this sample was .83 (95% CI .81-.84). Therefore, item scores were averaged to obtain a continuous score for victimization. Higher scores on the scale indicate higher levels of victimization.

**Metacognitions.** Metacognitions were assessed using the Italian version of the Metacognitive Questionnaire (MCQ-30; Quattropani, Lenzo, Mucciardi, & Toffle, 2014). The whole scale consists of five factors assessed by 6 items each (namely, positive beliefs about worry, negative beliefs about uncontrollability and danger, lack of cognitive confidence, beliefs about the need to control thoughts, and cognitive self-consciousness). For the purpose of the present study, and consistent with previous studies (Debbané et al., 2012), only two subscales were included: positive beliefs about worry (e.g., “Worrying helps me cope”) and negative beliefs about uncontrollability and danger (e.g., “When I start worrying I cannot stop”). The items were rated on a 4-point scale (from (1) “definitely disagree” to (4) “definitely agree”). The two-factor CFA for this sample confirmed that all items loaded on their respective factor: χ2(52)= 498.65, *p*< .001; CFI= .964; TLI= .954; RMSEA = .086, 90% CI [.079, .093]. The Cronbach’s alpha for the positive and negative subscales was .88 (95% CI .86-.89) and .77 (95% CI .75-.79) respectively. Higher scores indicate higher use of maladaptive metacognitions.

**Worry.** Worry was assessed using the Italian version of the Penn State Worry Questionnaire for Children (PSWQ-C; Chorpita, Tracey, Brown, Collica, & Barlow, 1997; Benedetto, Di Blasi, & Pacicca, 2014). Participants were asked to rate the extent to which each of the 14 items (e.g., “My worries really bother me”, “Once I start worrying, I cannot stop”, “I worry all the time”) was true for them. Items were rated on a 4-point scale (from (1) “not true at all” to (4) “always true”). The CFA confirmed an adequate fit between the model and the data: χ2(76) = 535.97, *p*< .001; CFI = .969; TLI = .963; RMSEA = .072, 90% CI [.066, .078]. The Cronbach’s alpha for the scale was .89 (95% CI .88-.90).

**Rumination.** Rumination was assessed using the Italian version of the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991; Palmieri, Gasparre, & Lanciano, 2007). Participants were asked to rate how often they think or do things listed in the 22 items (e.g. “I think ‘What did I do to deserve this?’”, “I think, ‘Why do I react this way?’”, “Think about all your shortcomings, failings, faults, mistakes”). Items were rated on a 4-point scale (from (1) “never” to (4) “always”). The CFA confirmed an adequate fit between the model and the data: χ2(206) = 1063.71, *p*< .001; CFI = .946; TLI = .939; RMSEA = .060, 90% CI [.056, .063]. The Cronbach’s alpha for the scale was .93 (95% CI .92-.94).

**Anxiety.** Anxiety was assessed using the 7-item Generalized Anxiety Disorder scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006). Participants were asked to rate how many times, during the current school year, they felt in certain ways as listed in the 7 items (e.g., “Feeling nervous, anxious or on the edge”; “Feeling afraid as if something awful might happen”). Items were rated on a 5-point scale (from (1) “never” to (5) “almost every day”). The CFA for this sample confirmed an adequate fit of the model to the data: χ2(13) = 127.05, *p*< .001; CFI = .989; TLI = .982; RMSEA = .087, 90% CI [.073, .101]. The Cronbach’s alpha for the scale was .89 (95% CI .88-.90).

**Depression.** Depression was assessed using the Short Depression-Happiness Scale (SDHS; Joseph, Linley, Harwood, Lewis, & McCollam, 2004). It consists of 6 items rated on a 5-point scale (from (1) “never” to (5) “almost every day”). Participant were asked to rate how many times, during the current school year, they felt in the way described in each item (e.g., “I felt that life was meaningless”, “I felt happy” – reversed scored). The CFA for this sample confirmed the factorial structure of the original validated scale: χ2(6) = 22.69, *p*< .001; CFI = .996; TLI = .991; RMSEA = .049, 90% CI [.029, .071]. The Cronbach’s alpha for the scale was .78 (95% CI .76-.80).

**Somatic symptoms.** Somatic symptoms were assessed using 5 items derived from the Health Behavior in School-Aged Children Symptoms Checklist (HBSC-SCL; Haugland & Wold, 2001; Gini, 2008b). Participants were asked to rate “How often have you had the following symptoms during the current school year? [headache, stomachache, leg/neck/back muscle pain, sleeping problems, poor appetite]. Responses ranged from (1) “rarely or never” to (5) “almost every day”. Results of the CFA for this sample were the following: χ2(5) = 27.39, *p*< .001; CFI = .989; TLI = .978; RMSEA = .062, 90% CI [.041, .086]. The Cronbach’s alpha for the scale was .77 (95% CI .75-.79).

**Data Analyses**

First, correlation analyses were conducted to explore the associations between the variables of the study. The pattern of relationships specified by our theoretical model (Figure 1) was then tested through path analysis, using Mplus 8.2 (Muthén & Muthén, 1998-2017), utilizing a single observed score for each construct included in the model. The Robust Maximum Likelihood method estimator was used and bias-corrected bootstrap confidence intervals with 5000 bootstrapped iterations were used for calculating indirect effects, which were considered significant if their 95% confidence interval did not include zero. Moreover, the non-independence of observations (that is, students nested within school classrooms) was handled using the ‘Type=complex’ function as implemented in Mplus. To evaluate the goodness of fit of the model we considered both the indices of fit (i.e., CFI, TLI, and RMSEA) and the R2 of each endogenous variable. In the tested model, the three indicators of psychological distress (anxiety, depression, and somatic symptoms) were the outcome variables, peer victimization was the independent variable, and the two types of metacognitions (positive and negative) and two thinking styles (worry and rumination) were the mediators between victimization and psychological distress (Figure 1).

After fitting the model for whole sample, we tested it independently in the two gender groups. Then, the null hypothesis of equality of the path coefficients across gender groups was tested with a series of Wald chi-square tests of parameter equalities in Mplus (Muthén & Muthén, 1998-2017; Wang & Wang, 2012, pp. 276-278; for recent applications of this method see also Gini, Marino et al., 2018; Pan, Zhang, Liu, Ran, & Teng, 2016). In other words, unstandardized coefficients were compared between groups (with the “Model test” command) to test for gender differences in the associations between the study constructs (Loehlin, 1998).

**Results**

Table 1 shows the means, standard deviations, and bivariate correlations between the variables included in the study. As expected, all the study variables were correlated with each other. In particular, a large positive correlation was found between victimization and the outcome variables, and between rumination and the outcome variables. The weakest link was observed between positive metacognitions and depression. Moreover, the mediators correlated with each other.

A first version of the theoretical model was tested including all the anticipated links. However, the path coefficient between worry and depression did not reach statistical significance and was very small in size (*b*=.05, *p*=.28). Therefore, this link was removed and the model was tested again.

**Results of the path analysis indicated an adequate fit to the data: χ2(8)= 65.34, *p*<.001; CFI=.982, TLI=.936, RMSEA=0.078 [90% CI: .061, .096].** All path coefficients were significant at the *p*<.001 level. The squared multiple correlations for the outcome variables indicate that the model accounted for considerable amount of variance for the three outcomes (i.e., 54% of the variance for anxiety, 36% of the variance for depression, and 26% of the variance for somatic symptoms). As regard mediators, the model accounted for 47% and 36% of the variance for thinking styles (worry and rumination respectively), whereas lower variance was observed for the other mediators (6% for negative and only 1% for positive metacognitions).

As shown in the Figure 2, victimization was found to be positively associated with the two metacognitions which, in turn, were positively linked to the two thinking styles that differently predicted the three outcomes. Specifically, negative metacognitions appeared as the strongest metacognitions leading to worry and rumination. As regard the associations between the proximal mediators for the dependents, rumination was more strongly associated with somatic symptoms than was worry, whereas the opposite result was found for anxiety. Finally, direct positive, but weaker associations between victimization and the three outcomes emerged.

Along with the direct paths, as shown in Table 2, all indirect effects were statistically significant. Specifically, the strongest indirect links were found between victimization and anxiety via negative metacognitions and worry, and between victimization and depression via negative metacognitions and rumination.

Before testing for gender differences in the paths of the model, this was estimated separately for the two groups (males: **χ2(8)= 37.23, *p*<.001; CFI=.976, TLI=.916, RMSEA=0.077 [90% CI: .053, .103]; females: χ2(8)= 32.69, *p*<.001; CFI=.982, TLI=.936, RMSEA=0.074 [90% CI: .049, .102]**). We then compared unstandardized path estimates between gender groups to test for significant differences in the associations between the study constructs. The omnibus Wald test of parameter constraints was not statistically significant (Wald χ2(15)=19.92, *p* = .17), indicating that gender did not influence the magnitude of the model paths, which do not significantly differ between males and females.

**Discussion**

While the associations between peer victimization and anxiety, depression, and somatic problems have been widely documented, both concurrently and longitudinally (Casper & Card, 2017; Gini & Pozzoli, 2013; Reijntjes et al., 2010; Ttofi et al., 2011), little empirical investigation, grounded in established clinical models, has been devoted to the understanding of the psychological mechanisms that may explain these associations; in addition, such investigations have rarely considered the three different outcomes together in a single model. The aim of the current study was the novel application of the Self-Regulatory Executive Function (S-REF) model of psychopathology (Wells & Matthews, 1994; 1996) to understanding the poor psychological adjustment associated with adolescents’ peer victimization.

With the exception of the path between worry and depression that was not statistically significant, the hypothesized model based on this application was confirmed in a large sample of adolescents. Briefly, findings of the current study showed that, consistent with past research (Gini & Pozzoli, 2013; Reijintjes et al., 2010; Ttofi et al., 2011), students who reported more peer victimization also reported more anxiety, depression, and somatic symptoms. However, in the path model the size of the direct links between peer victimization and the three outcome variables was quite small and reduced to about one-third of their bivariate correlations. Importantly, these links were significantly mediated by metacognitions and negative thinking styles (i.e., worry and rumination), as the S-REF model would predict (Wells & Matthews, 1994; 1996). First, peer victimization was positively associated both with positive and, more strongly, with negative metacognitions. Metacognitions were then linked to worry and rumination that, in turn, were associated with psychological and somatic problems. Overall, the results from the model tested in this study may be interpreted as giving support to the application of the S-REF model to peer victimization experiences. Even though replications of the validity of this model for the explanation of the psychological distress experienced by victimized adolescents are warranted, this first use of such model in the context of harsh peer relationships seems promising and may engender future research questions. For example, it would be valuable to test what other individual characteristics (e.g., coping strategies, personality traits, academic engagement) or contextual factors (e.g., social support from parents or peers, quality of teacher-student relationships, school responses to bullying episodes) may exacerbate or decrease the use of maladaptive thinking styles that follow the experience of being victimized by peers. Moreover, it would be interesting to analyze whether youth who are target of peer aggression frequently engage in so-called “co-rumination”, that is, the process of extensively revisiting problems and focusing on negative feelings within a dyadic peer relationship, such as with a friend (Rose, 2002), and how this mechanism relates to their psychological distress.

Interestingly, the analysis of indirect effects showed that the strongest indirect paths were those linking peer victimization to anxiety via negative metacognitions and worry, on one hand, and peer victimization to depression via negative metacognitions and rumination, on the other hand. That is, they suggest that negative metacognitions (i.e., beliefs about the uncontrollability and danger of thoughts) may be more relevant than positive metacognitions in exacerbating negative emotional states of targets of peer aggression. This is consistent with previous findings (e.g., Debbané et al., 2012) and the metacognitive theoretical tenet that argues that the key markers of psychopathology are negative metacognitions (Wells & Matthews, 1994; 1996). Moreover, the somewhat “differential” role of worry and rumination in respect to anxiety and depression is also consistent with both the S-REF model (Wells, 2009) and previous empirical research (e.g., Hong, 2007; Raes, 2010) showing that worry is a stronger predictor for anxiety and rumination for depression. The current study adds to this line of investigation showing that rumination is also more strongly associated than worry to somatic problems, at least for peer victimized adolescents.

As a final note, it should be noted that we measured worry and rumination in general, not explicitly related to peer victimization experiences. This is important, because the evidence that these thinking styles play a role in the association between peer victimization and adolescents’ psychological distress supports the validity of the S-REF model in this context. Nonetheless, our understanding of the psychological processes that underlie victimized youth’s adjustment could benefit from the development and validation of an instrument that allows collecting information about adolescents’ worry and rumination about their own experiences of being victimized by peers. This is an important venue for future research.

**Limitations**

There are a number of limitations to this study that warrant consideration. First, consistent with much of the research in this area, the study utilizes a cross-sectional design. As such, conclusions regarding the directionality of associations cannot be made. The links hypothesized and tested in this study have both theoretical and empirical support (Spada et al., 2013; 2015; Wells & Matthews, 1994; 1996); however, in theory, the opposite direction may be possible. For example, the manifestation of depression may result in higher levels of worry and rumination, which may invite more victimization within the peer group. In addition, information was collected from adolescents themselves through self-reports. The individual is often the best informant for his/her own life experiences, such as victimization (especially in adolescence, when covert forms of victimization are quite common), and even more apparently for the related thoughts and feelings; nonetheless the current findings would be strengthened if replicated in future studies with a multi-informant approach, including peer nominations for victimization and clinical assessment for anxiety, depression, and somatic symptoms. Furthermore, in this study we only analyzed traditional victimization, but future studies should aim at testing the same model with cybervictimization, that is, victimization that occurs online. Finally, because this was the first attempt to apply the S-REF model to peer victimization, it was tested with a community sample of adolescents. This choice was also consistent with indications and current practice in bullying research that conceive involvement in peer victimization as more continuous than categorical (Casper, Meter, & Card, 2015). However, it would also be meaningful in future studies to replicate the same model with clinical samples, that is, with subgroups of peer victimized adolescents who have been diagnosed for depression or anxiety.

**Implications**

Despite limitations, findings from this study have a number of applied implications for clinical psychologists and for professionals working in clinical or school settings. First, this study confirms the importance of providing supports to students who are targets of peer victimization, given links to compromised mental and physical health, which can sometimes lead to extremely serious consequences (Gini & Espelage, 2014; Holt et al., 2015). Evidence-based anti-bullying interventions usually propose a “whole school” approach that aims to reduce overall rates of peer victimization (Storer, Casey, & Herrenkohl, 2017; Zych, Farrington, Llorent, & Ttofi, 2017), however overall decreases in victimization do not necessarily reduce its negative impact among those students who continue to be targeted. Youth identified as experiencing peer victimization would benefit from referrals to the school psychologist or counselor for further evaluation such that appropriate mental health support can be put in place. When clinical treatment would be deemed necessary for victimized youth, clinicians should consider using metacognitive therapy to help them interrupt perseverative thinking and free valuable cognitive resources needed for effective problem-solving (Spada, Nikčević, Moneta, & Wells, 2008; Wells & Simons, 2009). Second, from a broader point of view, psycho-educational programs for adolescents may be used to increase their knowledge of how the negative thinking styles work, to make them more aware about their own use of such styles in everyday situations, and to teach them how to challenge metacognitive beliefs and the possible alternative strategies to deal with stressful peer relationships and related negative feelings.

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**Figure 1. Hypothesized theoretical model of the links between peer victimization and negative outcomes through metacognitions, worry and rumination**

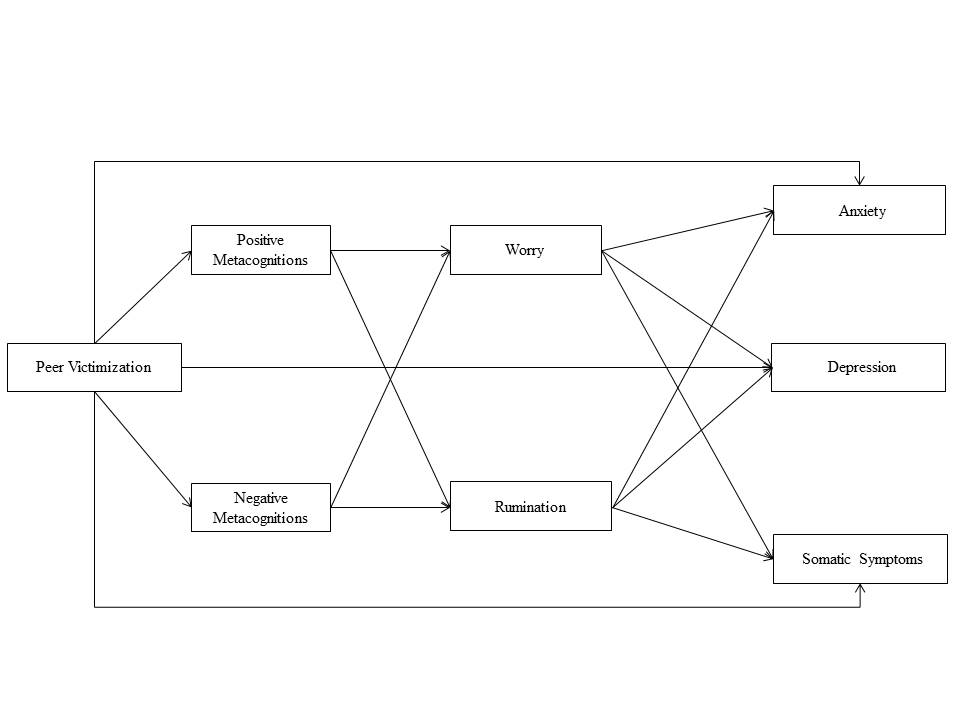
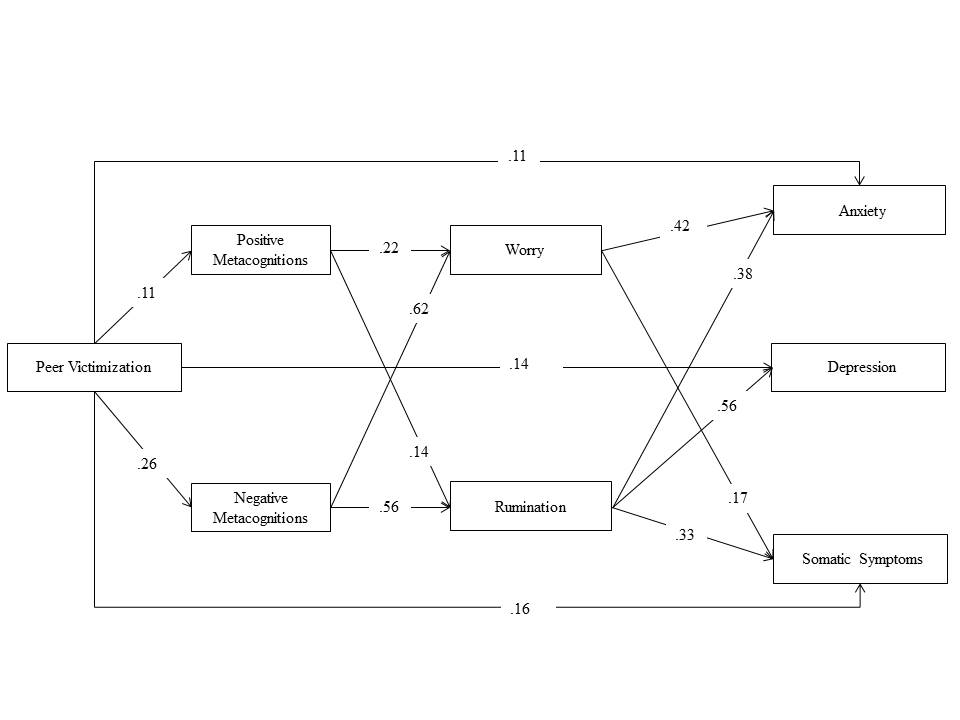
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Figure 2. Results of path analytical model.



Notes: *N*=1169; all coefficients are significant at *p*<0.001.

Table1. Descriptive statistics and bivariate correlations among the study variables.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Peer victimization | 1.44 | .44 | - |  |  |  |  |  |  |
| 2. Anxiety | 2.81 | .99 | .32 | - |  |  |  |  |  |
| 3. Depression | 2.49 | .83 | .34 | .52 | - |  |  |  |  |
| 4. Somatic symptoms | 2.61 | .92 | .31 | .59 | .38 | - |  |  |  |
| 5. Positive metacognitions | 2.04 | .70 | .11 | .22 | .07\* | .10 | - |  |  |
| 6. Negative metacognitions | 1.94 | .64 | .26 | .60 | .46 | .41 | .16 | - |  |
| 7. Worry | 2.39 | .59 | .18 | .66 | .38 | .40 | .32 | .65 | - |
| 8. Rumination | 2.15 | .58 | .37 | .66 | .60 | .49 | .23 | .59 | .60 |

Notes: *N*=1169; \**p*<0.05, all other *p*<0.001.

Table 2. Standardized indirect effects of the independent (victimization) on the three outcomes (anxiety, depression, and somatic symptoms) via the mediators (metacognitions and thinking styles).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Independent | Metacognitions | Thinking style | Outcome | | | | | | | | |
| Anxiety | | | Depression | | | Somatic Symptoms | | |
|  |  |  | Est. | 95% CI | | Est. | 95% CI | | Est. | 95% CI | |
| Victimization | Positive | Worry | .010 | .004 | .017 | / |  |  | .004 | .002 | .008 |
| Victimization | Positive | Rumination | .006 | .002 | .012 | .008 | -.033 | -.017 | .005 | .002 | .011 |
| Victimization | Negative | Worry | .066 | .049 | .085 | / |  |  | .027 | .016 | .041 |
| Victimization | Negative | Rumination | .055 | .038 | .076 | .081 | .058 | .108 | .048 | .030 | .073 |

Note: 95% CI = bias-corrected bootstrapped confidence interval