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**Emotion regulation as a predictor of depression and psychosocial impairment in adolescence moderated by negative life events**

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### **Abstract**

Depression and psychosocial impairment have become serious health problems among adolescents. The choice in emotion regulation strategies implemented by these adolescents, when faced with negative life events, can function as a protective/risk factor for the development of depression. As such, the aim of this longitudinal study was to examine the moderating effect of negative life events in the relationship between these emotion regulation strategies and the presence of depressive symptoms and psychosocial impairment.

The sample consists of 117 adolescents aged between 13 and 16 years. In order to assess the variables mentioned above, data collection consisted of self-report measures namely the 1) the Children's Depression Inventory (CDI: Kovacs, 1983; Translation and adaptation by Marujo, 1994); 2) Cognitive emotion regulation questionnaire (CERQ: Garnefski, N., Kraaij, V., e Spinhoven, P., 2001; Translation and adaptation by Matos, Cherpe & Serra, 2012); 3) Daily Hassles Scale Microsystem (DHMS: Seidman et al., 1995; Translation and adaptation by Paiva & Matos., 2009); and 4) the Adolescent Longitudinal Interval Follow-up Evaluation (A-LIFE, Keller et al., 1993; Portuguese version: Matos & Costa, 2011).

Maladaptive emotion regulation strategies such as brooding and catastrophizing were found to be positive predictors of depressive symptomology and psychosocial impairment in the female sample, as well as self-blame in the total sample. On the other hand, emotion regulation strategies such as positive reappraisal and refocus on planning were found to be negative predictors of depressive symptomology and psychosocial impairment in both the total and female samples, whereas positive refocusing was found to be a negative predictor solely in the total sample. The school and peer hassles demonstrated being the main positive predictors of depressive symptomology and psychosocial impairment. Several moderating effects were found for negative life events in the relationship between adaptive/maladaptive emotion regulation strategies and depressive symptomology/psychosocial impairment.

**Key words:** depressive symptomology; psychosocial functioning; cognitive emotion regulation strategies; negative life events; moderating effect; adolescence.

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## **Introduction**

According to the World Health Organization (WHO), it is expected that by 2020 depression will be one of the most prevalent diseases among the world population (Murray & Lopez, 1996). A significant increase in the prevalence rates of this mental disorder among adolescents has also been verified (Twenge & Nolen-Hoeksema, 2002; Cardoso, Rodrigues, & Vilar, 2004; Hankin, Mermelstein, & Roesch, 2007; Jane Costello, Erkanli, & Angold, 2006).

Previous investigations suggest that depression in adolescence is often associated with a negative prognosis, inflicting a higher tendency for these individuals to experience recurrent episodes of depression after the onset of the disorder (Fergusson, Boden, & Horwood, 2007). According to these authors, aside from depression, anxiety disorders and suicidal behaviours may also be common repercussions found among depressed adolescents, during and subsequently to this developmental stage, increasing risk for future psychopathology and higher levels of general maladjustment. These implications are limiting, both short and long term, and recent investigation in this area has been focusing on prevention and intervention programmes in order to reduce the negative effects of depression.

Various forms of psychopathology are associated to emotion regulation (Berking & Wupperman, 2012; Kim & Cicchetti, 2010). Throughout literature, we have found various studies suggesting that certain strategies (e.g., suppression and catastrophizing) are generally more maladaptive than others (e.g., positive reappraisal), being that they have a more deleterious impact on emotional disposition in comparison with the relative absence of more adaptive strategies (Garnefski, Boon & Kraaij, 2003; Aldao, Nolen-Hoeksema, & Schweizer, 2010), especially when faced with adverse events. Negative life events have been shown to increase depressive symptomology, even more so when associated with maladaptive emotion regulation strategies which tend to increase the depressogenic effect of these events. Therefore, the implementation of maladaptive strategies has been found to increase the risk and vulnerability of adolescents in relation to stress and internalizing problems, including depression (Steinberg, 2005).

In this sense, we see fit to study the relationship between emotion regulation strategies and negative life events in the prediction of depression and psychosocial impairment in a sample of adolescence, analysing the moderating effect of these events as well as possible clinical implications and contributions for prevention and intervention programmes in depressed youth.

## **1. Conceptual framework**

### **1.1. Depression and psychosocial impairment in adolescence**

Adolescence can be defined as a developmental period marked by significant changes in the various physiological, emotional, social and intellectual domains. These changes are essential to a normative development, including individuation and greater emotional empowerment processes, and they are strongly influenced by the individual's personal characteristics and abilities to achieve goals and overcome developmental obstacles. Some authors consider that these transformations typically manifested during this developmental stage may justify the mood swings often observed, as well as depressive mood (Larson, Moneta, Richards, & Wilson, 2002; Gilbert, 2012). However, clinical symptoms of depression go beyond these typical oscillations, and their identification according to diagnostic criteria was only possible in 1975, for both children and adolescents (Monteiro & Laje, 2007). According to the data obtained in the study of 3PDA parental programme for prevention of depression in adolescence in Portugal, an investigation in which this study takes part, 8% of the community sample is depressed and 19% is considered at risk for depression, presenting results between the 75<sup>th</sup> and 90<sup>th</sup> percentile in the Children's Depression Inventory (CDI) (Pinheiro e Matos, 2015).

Depression in adolescence may be the result of psychological and social maladjustment due to the interaction between internal and external factors, leading to the onset of specific maladaptive emotional and behavioural patterns (Nolen-Hoeksema & Hilt, 2008). The developmental requirements may exceed the adolescent's current abilities, thus becoming risk factors that may increase vulnerability to psychopathology, resulting in an increase in negative affect and emotional reactivity which are frequently observed in depressed youth (Salvador, Oliveira, Matos, Arnarson, & Craighead, 2015). Among these risk factors, Nolen-Hoeksema & Hilt (2008) make reference to genetic and biological factors, negative cognitive styles, difficulties in interpersonal relationships, and negative events.

Studies suggest that differences in the manifestation of depressive symptomology begin to emerge at the age of 13, verifying a higher prevalence among female adolescents (Nolen-Hoeksema e Girgus, 1994; Ge, Conger, & Elder, 2001; Bahls, 2002). According to Nolen-Hoeksema and Girgus (1994), this discrepancy may be associated with the existence of a great number of risk factors (biological and psychosocial mechanisms) in girls throughout their development compared to male adolescents.

Depression in adolescence is associated with an acute and chronic course, mortality (10% of deaths in depressed adolescents are caused by suicide) (Bahls, 2002), and high levels of comorbidity with other disorders (Fleming, J. E., Offord, D. R., & Boyle, M. H., 1989, cited by Brito, 2011), such as anxiety disorders. DUNN's study (2006) suggests that about 18% of adolescents diagnosed with depression reported the permanence of their psychological condition in adulthood. According to McCabe, Ricciardelli, & Banfield (2011), depression also has a significant impact in various domains of psychosocial functioning (Hirschfeld et al., 2002), being that children with moderate and severe levels of depressive symptoms report psychosocial disturbances, more negative affect, and decreased positive affect and self-concept. Judd et al. (2000) point to the linear relationship established between psychosocial functioning and depressive symptoms, suggesting that an increase in depressive symptomology is associated with an increment in overall impairment ratings.

## **1.2. Emotion regulation and psychopathology**

Emotion regulation is an emotion processing competence that involves the implementation of strategies aimed to adjust the intensity and expression of our emotions in a given situation (Leahy, Tirch, & Napolitano, 2001). Throughout childhood emotion regulation is often extrinsic, given that the strategies to regulate children's emotions are commonly implemented by their caregivers. Only during adolescence do individuals develop cognitive skills of emotional self-regulation (Tooby & Cosmides, 1990; Goodyer, 1995; Yap et al., 2007; Nolen-Hoeksema & Hilt, 2008). It is also during this developmental stage in which the adolescent is faced with developmental challenges and stressful situations that may interfere with this learning process, thus compromising the acquisition of adaptive emotion regulation strategies.

Studies suggest that positive reappraisal is an effective strategy in reducing negative affect and increasing positive affect, having been shown positively associated with higher levels of subjective and psychological well-being in adolescents faced with adverse situations (Gross, 1998; Freire & Tavares, 2011; Rood, Roelofs, Bögels, & Arntz, 2011; Duarte, Matos, & Marques, 2015). According to a study conducted by Garnefski, Kraaij & Van Etten (2005) with a sample of adolescents, specific emotion regulation strategies such as self-blame and rumination (Muris & Ollendick, 2005; Garnefski, Kraaij & Van Etten, 2005; Garnefski & Kraaij, 2006; Eisenberg, et al., 2009; Pitzer, Jennen-Steinmetz, Esser, Schmidt, & Laucht, 2011; Conceição & Carvalho, 2013; Arnarson et al., 2015), as well as the lack of other



strategies like positive reappraisal, were strongly and exclusively associated to internalizing problems, such as depression. Salvador et al. (2015) also found that self-blame and rumination may be mediating factors in the relationship between depression and comorbid psychological disorders such as social anxiety. Another study found evidence that overthinking, as a maladaptive strategy of emotion regulation, contributes with a mediator effect between brooding and depressive symptoms, increasing the predictive ability of these variables of depressive symptomology at a later stage (Arnarson et al., 2015).

Yap et al. (2011) found in a sample of adolescents a significant mediating effect of the variable response to negative affect, in the relationship between temperament and depressive symptomology. According to the results, high levels of negative affect and low levels of effortful control were associated to more depressive symptoms as a result of a less frequent engagement in emotion coping responses and more maladaptive inhibition or dysregulated expressions.

Some empirical studies point to an increased risk for depressive symptomology in the use of maladaptive strategies for emotion regulation (Arnarson et al., 2015; Duarte, Matos, & Marques, 2015) or the insufficiency of adaptive strategies in the repertoire of emotion regulation strategies (Garnefski & Kraaij, 2006). Ge, Conger & Elder (2001) also indicate that emotional dysregulation may be a consequence of the incorrect implementation of adaptive strategies. As for discrepancies according to gender, a previous cross-sectional study found that adolescent girls have a higher tendency to implement more maladaptive emotion regulation strategies such as rumination and self-blame (Duarte, Matos, & Marques, 2015).

### **1.3. Negative life events and psychopathology**

Negative live events (NLE) can be considered external risk factors which contribute for the development of problems of psychological nature when interacting with genetic predispositions (Mash & Barkley, 1996, cited in Grant et al., 2006). In a study conducted with college students, attention was drawn to the interaction between positive life events (PLE), NLE and depressive symptoms. The results suggest that higher levels of NLE lead to higher levels of depressive symptoms. No significant direct relationship was found between depressive symptoms and PLE, however the latter did appear to have a buffering effect in the relationship between depressive symptoms and NLE, in the sense that the depressogenic effect of higher levels of NLE seem to be reduced when the participants had also experienced higher levels of PLE (Dixon & Reid, 2000).

Among the individual factors that interact with these stressful events, Hankin et al. (2004) focused their attention on cognitive vulnerability-stress models, namely the hopelessness theory and Beck's cognitive theory, and their interaction with NLE. According to the theories, cognitive vulnerability consists of depressogenic cognitive styles and dysfunctional attitudes in interaction with NLE, as well as the negative inferences regarding the cause, consequences and meaning of those adverse events. In their study conducted with a sample of undergraduate students, the authors concluded that the processes and mechanisms involved in their operationalization of cognitive vulnerability, when in interaction with NLE, predict an increase in depressive symptomology. According to Nakai et al. (2015), genetic predisposition characteristics such as temperament can also interact with life events, both positive and negative, childhood abuse and depressive symptoms. These authors found in a sample of adults that PLE reduced the depressogenic effect of temperament (in the cyclothymia and anxiety dimensions) on depressive symptoms. They also found that irritable temperament not only elevated depressive symptomology as well as increased the depressogenic effect of the NLE, while hyperthymic temperament inhibited this effect.

Previous studies suggest that during adolescence there is a tendency for a gradual increase in NLE associated with new biological, cognitive, and social demands, particularly in the family and school context (Pereira, Nunes, Lemos, & Nunes, 2013), verifying greater prevalence among female adolescents (Jose & Ratcliffe, 2004; Ruivo, Matos, & Oliveira, 2015). It is also important to note that girls appear to be more likely, in general, to experience traumatic events during childhood and adolescence when compared to boys, including situations of sexual and physical abuse (Rheingold et al., 2004).

This gender difference in exposure to NLE also appears to be linked to the way boys and girls experience these events and the areas in which they occur (Hankin, Mermelstein, & Roesch, 2007), given that girls tend to react more intensely to the same NLE than boys (José & Ratcliffe, 2004; Pereira, Nunes, Lemos, & Nunes, 2013). Female adolescents report that most of the NLE that they are exposed to are related to interpersonal content, such as conflicting relationships in the family setting (Seidman, Allen, & Aber, 2003; Pereira, Nunes, Lemos, Nunes, 2013; Ruivo, Matos, & Oliveira, 2015) and with peers (Hankin, Mermelstein, & Roesch, 2007; Ruivo, Matos, & Oliveira, 2015), as well as in the school context (Pereira, Nunes, Lemos, Nunes, 2013; Ruivo, Matos, & Oliveira, 2015). Male adolescents also report NLE associated with achievement capacity in the school context, in relationship with peers, as well as conflicts within the family setting (Pereira, Nunes, Lemos, Nunes, 2013, Ruivo, Matos, & Oliveira, 2015).

The NLE reported having a higher propensity for the development of depression in adolescents were the non-normative events associated to aspects of psychological and social well-being (Sobrinho, Campos, & Mesquita, 2013). Bahls (2002) also observed that a depressed adolescent who experiences NLE of this nature is at greater risk for suicidal behaviour. In general terms, the report of NLE during adolescence is a strong predictor of internalizing problems, including depression (Goodyer, 1995; Kim, Conger, Elder, & Lorenz, 2003; Cole, Nolen-Hoeksema, Girgus, & Paul, 2006; Grant et al., 2006; Stroud et al., 2009), and is associated with a higher level of general maladjustment (Jose & Ratcliffe, 2004).

#### **1.4. Emotion regulation, negative life events, depression and psychosocial impairment**

The implementation of maladaptive strategies of emotion regulation in the presence of adverse events can result in the inability to deal efficiently with emerging conflicts, especially interpersonal conflicts for female adolescents (Pereira, Nunes, Lemos, Nunes, 2013), given that they tend to resort to social support when faced with stressful events. In the case of male adolescents, the authors suggest that it is more common to find avoidance behaviours (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Zalewski, Lengua, Wilson, Trancik, & Bazinet, 2011), as well as externalizing behaviours and addiction problems (Pereira, Nunes, Lemos, Nunes, 2013). Both maladaptive strategies implemented by adolescents, as well as the negative emotional impact caused by the NLE experienced are associated with a more pessimistic perception regarding the quality of life, thus, constituting emotional dysregulation a predictor of depressive symptoms (Yap et al., 2011; Pereira, Nunes, Lemos, Nunes, 2013) and psychosocial impairment (McCabe, Ricciardelli, & Banfield, 2011).

In a study conducted with a sample of adolescents regarding the potential moderating and mediating effects of different coping strategies in the relationship between NLE and the subsequent impact this had on psychological health, the authors found that brooding was positively associated with distress and negatively associated with satisfaction with life (Thorsteinsson, Sveinbjornsdottir, Dinsti, & Rooke, 2013). According to the results obtained in this study, distraction, social seeking and self-care were not only positively associated with satisfaction with life, but also reduced the impact of NLE on distress. In addition, depression may contribute to the increased probability of stressful events interfering with adolescents' occupational and social functioning, thus further increasing the vulnerability of the individual

to stress (Nolen-Hoeksema, 2001) and depression. Another study also analysed the effect of cognitive coping strategies in the relationship between NLE and depressive symptoms in a sample of adolescence. Results suggest that adolescents with more depressive symptoms reported using self-blame, brooding and catastrophizing to a significantly higher extent, whereas strategies such as positive refocusing and positive reappraisal were used significantly less when faced with an adverse event (Kraaij & Garnefski, 2002).

Some controversial issues found in the studies used in this literature review refer to the diagnosis of depression in adolescents using solely self-response measures (Garnefski, Boon, & Kraaij, 2003; José & Ratcliffe, 2004; Arnarson et al., 2015; Duarte, Matos, & Marques, 2015; Ruivo, Matos, & Oliveira, 2015; Salvador, Oliveira, Matos, Arnarson, & Craighead 2015). Methodologically speaking, few longitudinal studies were used for this review (José & Ratcliffe, 2004; Arnarson et al., 2015), being most of the studies cross-sectional studies and not allowing, thereby, conclusions about the causal relations between variables.

In this longitudinal study, our focus will be on assessing the interaction between NLE and cognitive emotion regulation strategies and their prediction of depressive symptoms and detrimental psychosocial functioning in Portuguese adolescents. The underlying goal is to assess the moderating effect of NLE in the relationship between emotion regulation strategies and depressive symptomology/psychosocial impairment. We would like to understand, with this investigation, to what extent these emotion regulation strategies increase/decrease the depressogenic effect of these adverse situations experienced.

## **2. Objectives**

Based on the above literature, the present study aims to assess the predictive effect of NLE and emotion regulation strategies on depressive symptoms and psychosocial impairment, as well as on the composite index (an operationalized construct which incorporates both depressive symptomology and psychosocial impairment), a construct created for this study which includes the existence of both depressive symptomology and psychosocial impairment), in a 6 month follow-up period based on a community sample of adolescents aged from 13-16. In this sense, our focus will be directed to more specific aspects, such as (1) the assessment of differences in depressive symptoms and psychosocial functioning, NLE and emotion regulation strategies when taking into account gender; (2) assess the association between the number of NLE and emotion regulation strategies

implemented through a cross-sectional analysis seeing that both of these variables are assessed in T1; (3) assess whether there is any relationship between the frequency of NLE and cognitive emotion regulation strategies used (T1) and depressive symptoms, psychosocial impairment and the composite index (T2) through multiple regressions; and (5) assess the moderating effect of NLE in the relationship between cognitive emotion regulation strategies and depressive symptoms, psychosocial impairment and the composite index. Thus, the following hypotheses are placed:

**H1:** There are significant differences by gender with regards to the presence of depressive symptoms and psychosocial impairment, as well as the composite index, being that girls and report higher levels of depressive symptoms and psychosocial impairment compared to boys;

**H2:** The implementation of emotion regulation strategies varies significantly according to gender, being that girls have a higher tendency to implement more maladaptive emotion regulation strategies compared to boys;

**H3:** There are significant differences with regards to gender with regards to exposition and frequency of NLE, given that girls tend to experience more NLE when compared with boys;

**H4:** There is a significant correlation between maladaptive cognitive emotion regulation strategies (T1) and depressive symptomology and psychosocial impairment (or the composite index) in T2, being that adolescents with higher levels of depressive symptoms and psychosocial impairment tend to resort to more maladaptive emotion regulation strategies;

**H5:** There is a significant correlation between adaptive cognitive emotion regulation strategies (T1) and depressive symptomology and psychosocial impairment (or the composite index) in T2, being that adolescents with lower levels of depressive symptoms and psychosocial impairment tend to resort to more adaptive emotion regulation strategies;

**H6:** There is a significant correlation between a high number of NLE (T1) and depressive symptomology and psychosocial impairment (or the composite index) in T2, being that adolescents with higher levels of depressive symptomology and psychosocial impairment tend to experience more NLE;

**H7:** There is a moderating effect of NLE (T1) in the relationship between cognitive emotion regulation strategies (T1) and depression and psychosocial impairment (or the composite index) in adolescence in T2.

### **3. Methodology**

#### **3.1. Description of the sample**

The present longitudinal study analysed a community sample that consisted of 117 adolescents aged between 13-16 in T1, being the average age 13.94 (SD = 0.92), where 37 subjects are male and 80 are female. An independent-samples t-test was conducted in order to assess statistically significant age differences among gender. There were no significant age differences found between males (M=14.22; SD=1.13) and females (M=13.81; SD=.78;  $t(52.4)=1.96$ ,  $p=.055$ ) in this study. Their engagement in the investigation consisted in responding to self-report questionnaires and an interview (A-Life) administered by the research team.

The sample was collected from public and private schools from the urban ( $n = 59$ ; 50.4%) and rural ( $n = 57$ ; 48.7%) centre regions of Portugal. With regards to their academic performance, 2 (1.7%) adolescents assessed their school performance as “Insufficient”, 18 (15.4%) as “Sufficient”, 36 (30.8%) as “Satisfactory”, 53 (45.3%) as “Good”, and 7 (6 %) as “Very good”, being that the majority of the adolescents’ attain “Satisfactory” and “Good” school performance. With regards to school failures, majority of the adolescents’ claim to have never failed a school year ( $n = 96$ ; 82.1%), whereas 15 students refer to having failed at least once (12.8%) and 5 students more than once (4.3%). With regard to familial related variables, 77 (65.8%) of the adolescents’ composing the sample possessed a low socioeconomic status, 24 (20.5%) a medium/middle socioeconomic status, and 16 (13.7%) a high socioeconomic status. As for their parents’ marital status, 2 (1.7%) reported having single parents, 18 reported having divorced (12%) or separated (3.4%) parents, 96 reported having parents’ married (75.2%) or together (non-marital status) (6%), and 2 reported having widowed parents’ (1.7%).

## 3.2. Measures

This next section is dedicated to the description of the instruments used for the collection and statistical analyses of the present research data.

### 3.2.1. Children's depression inventory (CDI) (M. Kovacs P. D. D., 1983; Portuguese version: Marujo, 1994)

The Children's Depression Inventory (CDI) is a self-report measure aimed to assess the level and severity of depressive symptoms in children aged from 7 to 17 years. It is composed of 27 items distributed over 5 factors, such as negative mood, interpersonal problems, ineffectiveness, anhedonia and low self-esteem. Each factor includes 4 items except for anhedonia, which is composed of 6 items. For each item, the participant chooses one of the three statements ranging from 0 (absence of problem), 1 (moderate symptom) and 2 (definitive symptom) that best represents their emotional state in the last two weeks. The total score is calculated by summing up the answers attributed to all 27 items, varying between 0 and 54 values. In order to score the instrument correctly, the reversed items should be taken into account, namely items number 2, 5, 7, 8, 10, 11, 13, 15, 16, 18, 21, 24, and 25.

The original version of this instrument (Kovacs, 1985) revealed good psychometric qualities with regards to internal consistency and reliability, presenting Cronbach's alpha values ranging from .83 to .94. The Portuguese version of the CDI also reflected good accuracy and internal consistency when assessed with Cronbach's alpha (between 0.80 and 0.84), proving to be more effective as a unidimensional structure (Marujo, 1994). This psychometric study also found a univariate structure for the CDI. Dias & Gonçalves (1999) also an alpha value of .80, which is representative of good internal consistency for the total score of the scale. As for this study, the Cronbach's alpha value obtained was .90 for the total CDI score, revealing good internal consistency (see Table 1, page 22). With regards to the factors composing this scale, only *Negative humour* ( $\alpha = .80$ ) and *Negative self-esteem* ( $\alpha = .74$ ) revealed good internal consistency. As for the remaining factors, they all revealed low Cronbach's alpha values ( $\alpha < .70$ ), leading us to take into consideration the total score of the scale given the purpose of this investigation and its univariate structure.

**3.2.2. Cognitive emotion regulation questionnaire (CERQ)** (Garnefski, N., Kraaij, V., e Spinhoven, P., 2001; Translation and adaptation by Matos, Cherpe & Serra, 2012)

The CERQ is a multidimensional questionnaire consisting of 36 items designed to assess aspects and cognitive styles of emotion regulation with difficult and stressful situations. It is a measure administered to individuals of 12 years of age or older, since it's considered that from this age the subject already has cognitive abilities to realize the significance of the issues of the items. Items are rated on a Likert scale ranging from 1 (almost never) to 5 (almost always), and these are grouped into nine dimensions (each of which is composed of four items). The nine dimensions are as follows: self-blame (thought of blaming yourself for what you have experienced), blaming others (thoughts of blaming others for what you have experienced), brooding or rumination (focus on thoughts and feelings associated to a negative event), catastrophizing (thoughts of emphasizing terror associated to an experience), putting into perspective (thoughts about emphasizing the relativity of the situation when compared with other events), positive refocusing (thinking about joyful and pleasant issues instead of thinking about the negative event), positive reappraisal (thoughts of attaching a positive meaning to the negative event), acceptance (thoughts of accepting and resigning yourself to what you have experienced) and refocus on planning (thoughts regarding what steps to take in order to handle the negative situation).

In the original version of this scale (Garnefski, Kraaij & Spinhoven, 2001), results achieved varied between factors. Some revealed weak internal consistency obtaining low Cronbach's alpha such as Positive reappraisal ( $\alpha = .41$ ) and Refocus on planning ( $\alpha = .63$ ), whereas others revealed good internal consistency with higher values such as Self-blame ( $\alpha = .82$ ) and Brooding ( $\alpha = .80$ ).

In the present study, the Cronbach's alpha value obtained for all the factors composing this scale revealed good internal consistency ( $\alpha > .70$ ), with the exception of the acceptance factor ( $\alpha = .67$ ) (see Table 1, page 22). However, this alpha value was considered acceptable and, therefore, all CERQ factors were taken in consideration for the analysis given the purpose of this investigation.



**3.2.3. Daily Hassles Microsystems Scale (DHMS)** (Seidman et al., 1995; Translation and adaptation by Paiva & Matos., 2009)

The DHMS is a self-report questionnaire that aims to measure minor daily hassles that have occurred in the last month. The DHMS version used for this investigation is composed of 46 items, being the last 4 items of optional completion which involve situations that have not been accounted for in the instrument (Seidman et al., 1995). This assessment scale evaluates 5 factors involved in the occurrence of minor negative life events, such as problems related to school, family, peers, neighbours, and resources content. The first four factors are straightforward regarding the area they comprise. As for the resources hassles factor, it includes the most basic physical and social needs, primarily those that are restricted to the home environment. Each item is assessed on a Likert point scale, varying from 1 (“It wasn’t a problem”) to 4 (“It was a big problem”) (Seidman et al., 2003), in order to assess the severity of the problem in the event of its occurrence.

In its original version, internal consistency scores were considered good for both the total score of the scale ( $\alpha = .89$ ) as well as the factors that constitute it. The Cronbach’s alpha values obtained varied among the school hassles factor ( $\alpha = .79$ ), the family hassles factor ( $\alpha = .75$ ), the peer hassles factor ( $\alpha = .74$ ), the neighbourhood hassles factor ( $\alpha = .71$ ) and the resources hassles factor ( $\alpha = .69$ ) (Seidman et al., 1995). In the Portuguese version, the total score presented a Cronbach’s alpha value of .82, being this value representative of good internal consistency. However, these values were slightly low, yet acceptable, for the school hassles ( $\alpha = .69$ ) and family hassles ( $\alpha = .62$ ) factors. The peer hassles factor obtained a reasonable value for internal consistency ( $\alpha = .72$ ), whereas the remaining factors such as neighbourhood hassles ( $\alpha = .50$ ) and resources hassles ( $\alpha = .48$ ) obtained inadmissible values for internal consistency (Paiva & Matos, 2009).

In the present study, the Cronbach’s alpha value obtained was .93 for the total DHMS score, revealing good internal consistency see (Table 1, page 22). With regards to the factors composing this scale, relatively low alpha values were obtained ( $\alpha < .70$ ), with the exception of the peer hassles factor which obtained a considerably higher alpha value ( $\alpha = .81$ ). However the remaining factors present acceptable alpha values for this analysis, given that the values did not differ significantly from cut-off point ( $\alpha = .70$ ), namely school hassles ( $\alpha = .63$ ), family hassles ( $\alpha = .64$ ) and resources hassles ( $\alpha = .67$ ). Neighbourhood hassles was the only factor that presented a lower alpha value ( $\alpha = .54$ ). Therefore, all the DHMS factors (with the

exception of the neighbourhood hassles factor), as well as the total score of the scale were used for the present statistical analysis.

#### **3.2.4. A-Life Interview (Adolescent – Longitudinal Interval Follow-up Evaluation)**

(Keller, et al., 1993; Translation and adaptation by Matos & Costa, 2011)

The A-Life Interview was developed from another instrument named LIFE (Longitudinal Interval Follow-up Evaluation) (Keller et al., 1987), a clinical interview for adults. A-Life is a semi-structured interview used to assess the longitudinal course of psychiatric disorders in sufficient detail, allowing researchers to date episodes of any of these disorders. With this level of accuracy, it is then possible to calculate the recovery time, the duration of the welfare (the period between episodes, if any), and the time for having subsequent relapse or recurrence. It consists of an instruction booklet and a coding sheet. The interview is divided into three general sections, including psychopathology, psychosocial functioning and general severity of the disorder (GSD). The first domain, psychopathology, gives us an understanding of the criteria and symptoms present in each disorder throughout the initiation and development during follow-up. Psychosocial functioning includes various areas in which the adolescent takes part of such as school performance, interpersonal relationships with the family, interpersonal relationships with friends and recreational activities. Ratings attributed may vary from 1 (very good), 2 (good), 3 (fair/slightly impaired), 4 (poor/moderately impaired), and 5 (poor/severely impaired), and they reflect the adolescent's functioning during the worst week of the preceding month. The total score for psychosocial functioning is calculated by summing the results obtained in the each dimension, divided by the total number of dimensions. Following the classifications assigned in this domain, the interviewer allocates a general classification regarding the adolescents' Global Social Adjustment (GSA). Lastly, the section analysing the general severity of the disorder (GSD) contains a 100 point scale which is completed based on the worst week of each month, allowing researchers to obtain a basis for comparison with other studies (Keller et al., 1987), as well as examine the evolution of the psychiatric disorder over a period of six months.

With regards to psychometric properties, Keller et al. (1987) found correlation coefficients between items ranging from .52 to .98. Inter-rater reliability was also found to be

to be considerably high for most of the psychosocial functioning and psychopathology measures.

## **4. Methodological procedures**

### **4.1. Procedure**

This study regarding high school students and their participation was conducted under the authorization of national bodies that regulate scientific research. All participants of this investigation were assured of confidentiality and requested to sign an informed consent. Parents and legal guardians were asked to sign informed consents in cases where students were minors. This investigation took place in high schools located in the centre region of Portugal, where the subjects were evaluated under the supervision of the research team and interviewed.

### **4.2. Analytical Strategy**

For the insertion and analysis of the data used in this investigation, the Statistical Package for Social Sciences (SPSS), version 23.0 for Windows, was used.

In order to understand if gender differences were significant, student t-tests were conducted (see Table 1, page 22). Results were considered to be statistically significant when  $p \leq .05$  (Marôco, 2010). Pearson correlations were used in order to study the existing relationships between variables. Values equivalent to  $r < .20$  were considered to determine a very low correlation;  $.20 < r < .39$  low correlation;  $.40 < r < .69$  moderate correlation;  $.70 < r < .89$  high correlation; and  $> .90$  very high correlation (Pestana & Gageiro, 2008).

The possible moderator effect of NLE in the relationship between emotion regulation strategies and depressive symptomology, psychosocial functioning and the composite index was also studied. A variable is defined as a moderator when it affects the direction and/or strength of the relationship between the two variables (Baron & Kenny, 1986). For this purpose, the independent and moderator variables were standardized, reducing the multicollinearity effects (Marôco, 2010). Subsequently, the interaction term variables were created by multiplying the predictor variable (CERQ factors) and moderator variable (DHMS factors and total score). Hierarchical multiple linear regressions were conducted, where the criterion variable alternated between depressive symptomology, psychosocial functioning

and the composite index. In the procedure of the regression, the first variable entered was one of the factors of the predictor variable, followed by a factor or the total score of the moderator variable and, finally, the interaction between the two. We can indicate the presence of an interaction effect when the interaction term is significant ( $p \leq .05$ ). Graphical representations of the moderating effects found were generated and displayed.

## **5. Results**

### **5.1. Preliminary analysis of the data**

Assumptions of normality were analysed for all variables using the Kolmogorov-Smirnov test. The results suggest that the sample does not possess a normal distribution (K-S,  $p \leq .001$ ) in all the variables used in this study. Levene's test was also conducted in order to verify the variance homogeneity, due to its robustness in the face of normal deviations, and the results obtained lead to conclude that the assumption of normality was not fulfilled (Pallant, 2010). However, skewness ( $sk < |3|$ ) and kurtosis ( $ku < |10|$ ) values demonstrate that there was no significant bias regarding the mean. Therefore, the bias did not compromise the normal distribution of the data (Kline, 2011).

Outliers were detected through the graphical representation of the results produced during the analysis process. However, the removal of these extreme observations produced no significant changes to the results and, therefore, remained accounted for in the observation of the data (Tabachnick & Fidell, 2007). Linearity and homoscedasticity assumptions were fulfilled through scatterplot analysis, where normally distributed residuals were also observed and confirmed using the Durbin-Watson test. No multicollinearity problems were found (tolerance values  $> .10$  and Variance Inflation Values (VIF)  $< 10$ ), suggesting an independent relationship between independent variables (Field, 2009). Thus, data were considered appropriate, as well as the sample size (Tabachnick & Fidell, 2001), for the realization of the hierarchical multiple regression.

### **5.2. Gender differences**

Student t-tests for independent samples were conducted with the purpose of analyzing the existence of differences according to gender among the various variables. Higher levels of depressive symptomology were demonstrated among girls (see Table 1). As for emotion

regulation strategies, both brooding and blaming others appeared to be statistically different between genders. Given that higher values indicate higher implementation, results showed that girls present higher levels of brooding, whereas boys manifest a higher tendency to blame others. As for the magnitude of the differences in the means, results suggest that brooding was the only variable presenting a medium effect size ( $>.5$ ) (Cohen, 1988), whereas the remaining variables with statistically significant differences between gender revealed small effect sizes. No statistically significant differences were found among gender with regard to psychosocial functioning and NLE.

Table 1. Cronbach's alpha ( $\alpha$ ), Means (M) and Standard Deviations (SD) for the total sample and for male and female groups, with t tests to analyse differences according to gender and Cohen's d analysis to test effect sizes

	$\alpha$	Total sample (N=117)		Male (n=37)		Female (n=80)		t	P	d
		M	SD	M	SD	M	SD			
<b>Measures</b>										
<b>Depressive symptomology (CDI)</b>	0,9	9,38	6,89	7,54	4,8	10,15	7,54	-2,34	0,021	0,43
<b>Psychosocial functioning (A-life)</b>	-	1,85	0,57	1,83	0,67	1,86	0,53	-0,272	0,786	0,05
<b>Self-blame (CERQ)</b>	0,71	9,33	3,14	8,97	2,64	9,5	3,35	-0,843	0,401	0,18
<b>Blaming others (CERQ)</b>	0,7	7,22	2,5	8,05	2,53	6,84	2,4	2,508	0,014	0,28
<b>Brooding (CERQ)</b>	0,79	11,41	3,69	9,78	3,5	12,16	3,55	-3,384	0,001	0,68
<b>Catastrophizing (CERQ)</b>	0,77	8,77	3,55	8,73	3,3	8,79	3,68	-0,082	0,935	0,14
<b>Putting into perspective (CERQ)</b>	0,76	11,32	3,61	10,84	3,79	11,54	3,52	-,975	0,331	0,24
<b>Positive refocusing (CERQ)</b>	0,86	11,77	4,19	11,38	4,1	11,95	4,24	-0,685	0,495	0,16
<b>Positive reappraisal (CERQ)</b>	0,84	12,38	3,94	11,97	3,66	12,58	4,07	-0,768	0,444	0,19
<b>Acceptance (CERQ)</b>	0,67	11,74	3,35	11,11	3,07	12,03	3,45	-1,383	0,169	0,02
<b>Refocus on planning (CERQ)</b>	0,82	12,88	3,71	12,27	3,55	13,16	3,77	-1,212	0,228	0,49
<b>School hassles (DHMS)</b>	0,63	1,59	0,74	1,53	0,66	1,63	0,77	-0,667	0,506	0,14
<b>Family hassles (DHMS)</b>	0,64	1,06	0,75	1,07	0,83	1,05	0,71	0,142	0,887	0,03
<b>Peer hassles (DHMS)</b>	0,81	1,14	0,89	1,01	0,79	1,2	0,93	-1,097	0,275	0,22
<b>Resources hassles (DHMS)</b>	0,67	0,71	0,67	0,68	0,72	0,73	0,65	-0,428	0,67	0,07
<b>DHMS (total)</b>	0,93	21,76	11,73	21,05	13,04	22,09	11,15	-,442	0,66	0,09

Note. M = Mean; SD = Standard Deviation; CDI = *Children's Depression Inventory*; CERQ = *Cognitive Emotion Regulation Questionnaire*; DHMS = *Daily Hassles Microsystem Scale*.

### 5.3. Study of the correlations

Pearson correlations were conducted in order to identify the relationships between variables. From the analysis, high and moderate correlations were found between all dependent variables, namely the CDI, psychosocial functioning and the composite index (see attachment - Table 2). With regard to correlations established between the dependent variables (T2) and the independent variables (T2), results suggest that the CDI established significant moderate and positive correlations with self-blame, and low correlations with brooding, catastrophizing, positive refocusing, positive reappraisal and refocus on planning.

Concerning the DHMS, moderate and positive correlations were established between the CDI and school and peer hassles, as well the total score, and positive yet low correlations were observed with family and resources hassles. These results suggest that higher levels of self-blame promote an increase in depressive symptomology, as well as an elevated total score on the DHMS scale and the school and peer hassles factors.

Similar correlations were verified for the composite index, for both independent variables. Moderate and positive correlations were established between the composite index and both self-blame and catastrophizing, and a low yet positive correlation was obtained for brooding. As for adaptive emotion regulation strategies, low and negative correlations were established with positive refocusing, positive reappraisal and refocus on planning. These results suggest that higher levels of self-blame and catastrophizing lead to an increase in the composite index.

As for the psychosocial functioning, fewer significant correlations were noted. Low and positive correlations were found for self-blame and catastrophizing, whereas low and negative correlations were found for positive refocusing, positive reappraisal and refocus on planning. With regard to the DHMS, moderate and positive correlations were found between psychosocial functioning and the family hassles factor as well as the total score of the scale. Low and positive correlations were found for the school, peers and resources factors. These results suggest that higher scores obtained on the family hassles factor as well as on the total score of the DHMS scale promote an increase in psychosocial impairment.

Several significant correlations were also found between the CERQ and DHMS factors and total score in a cross-sectional analysis (both variables assessed in T1), having been verified only two moderate and positive correlations between catastrophizing and peer hassles, as well as with the total score of the DHMS scale. The remaining correlations established were low.

#### **5.4. Analysis of moderation effects**

Hierarchical multiple regression analysis were conducted in order to determine whether the existence of a moderating effect of NLE in the relationship between emotion regulation strategies and depressive symptomology, psychosocial functioning and the composite index in the present longitudinal study.

Several interaction effects were found in the relationship between emotion regulation strategies and depressive symptomology, as well as in the relationship between these strategies and the composite index. As for these interaction effects in the relationship between emotion regulation strategies and psychosocial functioning, no significant results were found, with the exception of the moderating effect of family hassles in the relationship between putting into perspective and psychosocial functioning. Next we will present the significant moderating effects found. In order to provide a better understanding of the results obtained, moderation effects observed in the relationship between maladaptive emotion regulation strategies and the dependent variables will be presented first, followed by moderation effects attained with more adaptive strategies.

#### 5.4.1. The moderating effect of the NLE between emotion regulation strategies and the depressive symptomology

After conducting a hierarchical multiple regression analysis, we can verify that the **total score of DHMS** has a significant predictor effect as well as a moderator effect in the relationship between **self-blame** and depressive symptomology, establishing a significant interaction ( $\beta = .155, p < .05$ ) (see Table 3). Both variables were found to be significant **positive predictors of depressive symptomology** when analysed separately (self-blame factor:  $\beta = .568, p < .05$ ; DHMS (total):  $\beta = .339, p < .001$ ).

Table 3. Regression coefficients of the three steps produced by a hierarchical multiple regression with self-blame, the total score of the DHMS scale and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R <sup>2</sup>	F	$\beta$	T	p
1	Self-blame factor	0,323	54,829	0,568	7,405	,000
2	Self-blame factor	0,423	41,845	0,449	5,903	,000
	DHMS (total)			0,339	4,457	,000
3	Self-blame factor	0,444	30,120	0,389	4,843	,000
	DHMS (total)			0,365	4,804	,000
	Self-blame * DHMS (total)			0,155	2,066	0,041

These variables originated statistically significant models in all three steps: Model 1:  $R^2 = .323, F_{(1,115)} = 54.829, p < .001$ ; Model 2:  $R^2 = .423, F_{(2, 114)} = 41.845, p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .444, F_{(3, 113)} = 30.120, p < .001$ . These results suggest an increase in the variance explained in relation to depressive symptomology at the time of interaction. This statistically significant coefficient (**44.4%**) indicates that the

slope that predicts the change in depressive symptoms according to the self-blame factor differs significantly depending on high or low DHMS (total) values.

In order to interpret the moderating effect, a graphical representation of the results was computed (see Figure 1). We can consider two levels for the self-blame factor and two levels for the total score of DHMS (below and above average). Considering main effects, it is possible to observe that higher levels of self-blame are associated with higher levels of depressive symptomology, and that lower levels obtained in the total score of DHMS predict lower levels of depressive symptomology. Both variables present a positive slope, meaning that they both positively predict depressive symptoms.

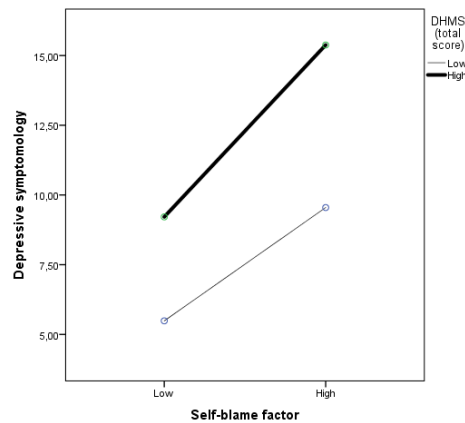


Figure 1. Graphic of the moderating effect of the total score of DHMS in the relationship between self-blame and depressive symptomology.

As for the interaction, it is noted that when self-blame levels are high, higher levels of NLE lead to increased levels of depressive symptomology, compared with lower levels of NLE. However, when self-blame is low, depressive symptomology tends to decrease regardless of the value obtained on the total score of the DHMS scale – visible through the alignment of the lines of the two levels of the total score (DHMS).

#### 5.4.2. The moderating effect of school hassles between emotion regulation strategies and depressive symptomology

With regards to the **school hassles** factor (DHMS), results suggest a significant interaction effect in the prediction of depressive symptomology when the independent variable was **self-blame** ( $\beta = .157, p < .001$ ). Both variables were found to be significant



**positive predictors of depressive symptomology** when analysed separately (self-blame factor:  $\beta = .568, p < .001$ ; school hassles factor:  $\beta = .292, p < .001$ ) (see Table 4).

Table 4. Regression coefficients of the three steps produced by a hierarchical multiple regression with self-blame, school hassles factor and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R2	F	B	T	P
1	Self-blame factor	0,323	54,829	0,568	7,405	,000
2	Self-blame factor	0,397	37,531	0,462	5,910	,000
	School hassles factor			0,292	3,745	,000
3	Self-blame factor	0,420	27,268	0,423	5,350	,000
	School hassles factor			0,285	3,705	,000
	Self-blame * School hassles factor			0,157	2,112	0,037

In the above analysis, the variables produced statistically significant models in all three steps: Model 1:  $R^2 = .323, F_{(1,115)} = 54.829, p < .001$ ; Model 2:  $R^2 = .397, F_{(2, 114)} = 37.531, p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .420, F_{(3, 113)} = 27.268, p < .001$ . In the third step (interaction term), the significant model produced show an increase in the percentage of variance explained in relation to depressive symptomology. In other words, the interaction between the predictor variable and moderator variable produced a statistically significant coefficient (**42%**), indicating that the slope that predicts the change in depressive symptoms according to the self-blame factor differs significantly depending on high or low school hassles values.

In Figure 2 we can observe the graphical result of the moderation effect for the interaction term between self-blame and school hassles in the prediction of depressive symptomology. Two levels (below and above average) were created for both the predictor and moderator variables. The chart allows us to verify that higher levels of self-criticism are associated with higher levels of depressive symptoms, and that lower levels obtained in the school hassles factor predict lower levels of depressive symptomology. Both variables present a positive slope, meaning that they both positively predict depressive symptoms.

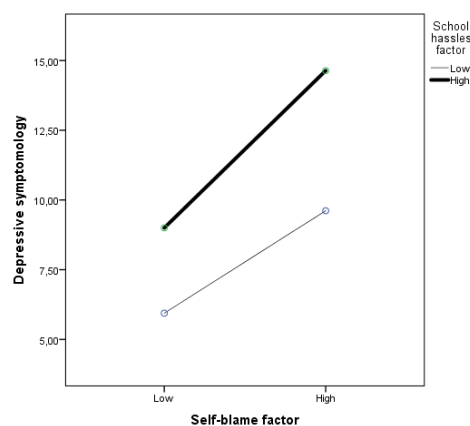


Figure 2. Graphic of the moderating effect of school hassles in the relationship between self-blame and depressive symptomology.

With regards to the interaction, it can be said that when the levels of self-criticism are high, high levels on the school hassles factor lead to increased levels of depressive symptomology, compared to lower levels obtained on this DHMS factor. On the other hand, when self-blame levels are low, depressive symptoms appear to be lower regardless of the value obtained in the school hassles factor (high or low).

As mentioned above, significant moderation effects were also attained for adaptive emotion regulation strategies. Given the page limit, a brief reference to the interaction effects found for the more adaptive emotion regulation strategies will be made. It is possible to find the tables and figures representatives of this data in the appendix for further analysis.

Findings suggest that the **school hassles** factor (DHMS) has also established a significant interaction effect in the prediction of depressive symptomology, when the predictor variable was **refocus on planning** ( $\beta = -.198, p < .05$ ) or **positive reappraisal** ( $\beta = -.216, p < .05$ ). Each of these variables were found to be individual **negative predictors of depressive symptomology** when analysed separately in interaction with the school hassles factor (see attachment - Tables 5 and 6), and in both cases statistically significant models were produced in the three steps indicating an increase in the percentage of variance explained in relation to depressive symptomology. As for the interaction term between these variables, we can see by analysing the charts that lower levels on the refocus on planning factor, as well as on the positive reappraisal factor, were associated with higher levels of depressive symptomology, and that lower levels on the school hassles factor predict lower levels of depressive symptomology. With regard to the interaction, it can be noted that when the levels of refocus on planning and positive reappraisal were lower, higher levels on the school hassles factor lead to increased levels of depressive symptomology. Nonetheless, when higher levels

were obtained on the refocus on planning and positive reappraisal factor, depressive symptomology was lower regardless of the results obtained on the school hassles factor (see attachment – Figures [3](#) and [4](#)).

#### **5.4.3. The moderating effect of peer hassles between emotion regulation strategies and depressive symptomology**

**Peer hassles** also produced a moderator effect in the relationship between emotion regulation strategies and depressive symptomology. However, interaction effects were only found for more adaptive strategies, such as **positive refocusing** ( $\beta = -.195, p < .05$ ), **refocus on planning** ( $\beta = -.265, p < .05$ ) and **positive reappraisal** ( $\beta = -.299, p < .05$ ). All variables were found to be significant **negative predictors of depressive symptomology** when analysed separately in interaction with the peer hassles factor (see attachment - Tables [7](#), [8](#) and [9](#)). In all of the above cases, statistically significant models were produced in the three steps indicating an increase in the percentage of variance explained in relation to depressive symptomology. As for the interaction term between these variables, we can see that similar results were found for these variables as when school hassles produced a moderating effect in previous analysis (point 5.4.2.) (see attachment – Figures [5](#), [6](#) and [7](#)).

#### **5.4.4. The moderating effect of DHMS factors (school hassles and peer hassles) between emotion regulation strategies and the composite index**

With regards to the **school hassles factor**, it was observed that it produced a significant moderating effect when interacting with **refocus on planning** ( $\beta = -.175, p < .05$ ). Both variables were found to be significant predictors of the composite index when analysed separately (see attachment - Table [10](#)). In the third step (interaction term), the statistically significant model produced indicated an increase in the percentage of variance explained in relation to the depressive symptomology and psychosocial functioning. As for the interaction term between these variables, we can see that similar results were found for these variables when analysed for the prediction of depressive symptomology only (CDI) (see attachment – Figure [8](#)).

As for the moderating effects found for **peer hassles**, statistically significant interaction effects were found when the predictor variables were **acceptance** ( $\beta = -.175, p < .05$ ), **positive refocusing** ( $\beta = -.175, p < .05$ ), **refocus on planning** ( $\beta = -.210, p < .05$ ) or

**positive reappraisal** ( $\beta = -.211, p < .05$ ). All of the above variables were found to be significant **negative predictors of the composite index** when analysed separately in interaction with the peer hassles factor (with the exception of the acceptance factor) (see attachment – Tables [11](#), [12](#), [13](#) and [14](#)). In the third model (interaction term), all variables produced statistically significant models, thus leading to an increase in the percentage of variance explained in relation to the depressive symptomology/psychosocial functioning. With regards to the interaction between the acceptance factor and peer hassles, it is possible to observe that higher levels of acceptance were associated to lower levels of the composite index, and lower levels of peer hassles predicted lower levels of the composite index. Additionally, it can be noted that when levels of acceptance are lower, higher levels of peer hassles lead to increased levels of the composite index compared to a low score on this DHMS factor. However, when higher levels of acceptance are observed, the composite index is higher regardless of the results obtained on the peer hassles factor (see attachment – Figure [9](#)). Finally, as for the remaining factors with which peer hassles established significant interaction effects (positive refocusing, refocus on planning and positive reappraisal), similar results were found for these variables when analysed for the prediction of depressive symptomology only (CDI) (see attachment – Figures [10](#), [11](#) and [12](#)).

Given the fact that some significant gender differences were found in some of the variables in the preliminary analysis, it was decided to analyse the existence of moderation effects separately for males and females. No significant moderation effects were found for the male sample. Therefore, the following analysis will refer to the female sample only.

#### **5.4.5. The moderating effect of school hassles between emotion regulation strategies and depressive symptomology for the female sample**

**School hassles** factor also produced a significant moderating effect for the female sample when in interaction with **self-blame** ( $\beta = .193, p < .001$ ). Both variables were found to be significant **positive predictors of depressive symptomology** when analysed separately (self-blame factor:  $\beta = .631, p < .001$ ; school hassles factor:  $\beta = .273, p < .01$ ) (see Table 15).

Table 15. Regression coefficients of the three steps produced by a hierarchical multiple regression with self-blame, school hassles factor and the interaction term in the prediction of depressive symptomology in the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	β	t	P
1	Self-blame factor	0,399	51,685	0,631	7,189	,000
2	Self-blame factor	0,461	32,912	0,520	5,675	,000
	School hassles factor			0,273	2,984	0,004
3	Self-blame factor	0,495	24,834	0,478	5,248	,000
	School hassles factor			0,248	2,753	0,007
	Self-blame factor *School hassles factor			0,193	2,267	0,026

In the above analysis, the variables produced statistically significant models in all three steps: Model 1:  $R^2 = .399$ ,  $F_{(1,78)} = 51.685$ ,  $p < .001$ ; Model 2:  $R^2 = .461$ ,  $F_{(2,77)} = 32.912$ ,  $p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .495$ ,  $F_{(3,76)} = 24.834$ ,  $p < .001$ . In the third step (interaction term), the significant model produced show an increase in the percentage of variance explained in relation to depressive symptomology. Therefore, the interaction between the predictor variable and moderator variable produced a statistically significant coefficient (**49.5%**), indicating that the slope that predicts the change in depressive symptoms according to the self-blame factor differs significantly depending on high or low school hassles values.

In Figure 13 we can observe the graphical result of the moderation effect for the interaction term between self-blame and school hassles in the prediction of depressive symptomology. Two levels (below and above average) were created for both the predictor and moderator variables. The chart allows us to verify that higher levels of self-criticism are associated with higher levels of depressive symptoms, and that lower levels obtained in the school hassles factor predict lower levels of depressive symptomology. Both variables present a positive slope, meaning that they both positively predict depressive symptoms.

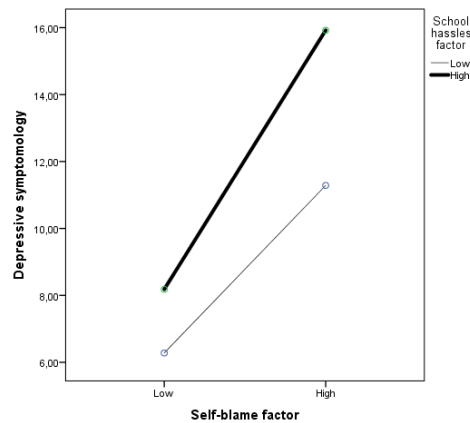


Figure 13. Graphic of the moderating effect of school hassles in the relationship between self-blame and depressive symptomology for the female sample.

When analysing the interaction term, we are able to observe that when the levels of self-criticism are high, high levels on the school hassles factor lead to increased levels of depressive symptomology, compared to lower levels obtained on this DHMS factor. On the other hand, when self-blame levels are low, depressive symptoms appear to be lower regardless of the value obtained in the school hassles factor (high or low).

Another significant moderating effect for **school hassles** was found in the relationship between **catastrophizing** and depressive symptomology for the female sample ( $\beta = .283, p < .05$ ). Both variables were found to be significant **positive predictors of depressive symptomology** when analysed separately (catastrophizing factor:  $\beta = .461, p < .05$ ; school hassles factor:  $\beta = .37, p < .05$ ) (see Table 16).

Table 16. Regression coefficients of the three steps produced by a hierarchical multiple regression with catastrophizing, school hassles factor and the interaction term in the prediction of depressive symptomology in the female sample (N=80)

Model	Predictors	R2	F	$\beta$	t	p
1	Catastrophizing factor	0,213	21,082	0,461	4,591	,000
2	Catastrophizing factor	0,320	18,142	0,318	3,102	0,003
	School hassles factor			0,358	3,490	,001
3	Catastrophizing factor	0,359	14,201	0,304	3,026	0,003
	School hassles factor			0,311	3,031	0,003
	Catastrophizing factor * School hassles factor			0,205	2,148	0,035

As we can see in the table above, the variables produced statistically significant models in all three steps: Model 1:  $R^2 = .213, F_{(1,78)} = 21.082, p < .001$ ; Model 2:  $R^2 = .320, F_{(2,77)} = 18.142, p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .359, F_{(3,76)} = 14.201, p < .001$ . In the third step (interaction term), the significant model produced show an increase in the percentage of variance explained in relation to depressive symptomology. Therefore, the interaction between the catastrophizing and school hassles produced a statistically significant coefficient (35.9%), indicating that the slope that predicts the change in depressive symptoms according to the catastrophizing factor differs significantly depending on high or low school hassles values.

A graphical representation the moderation effect was conducted (see Figure 14). Two levels (below and above average) were created for both the predictor and moderator variables. The chart allows us to verify that higher levels of catastrophizing are associated with higher levels of depressive symptoms, and that lower levels obtained in the school hassles factor

predict lower levels of depressive symptomology. Both variables present a positive slope, meaning that they both positively predict depressive symptoms.

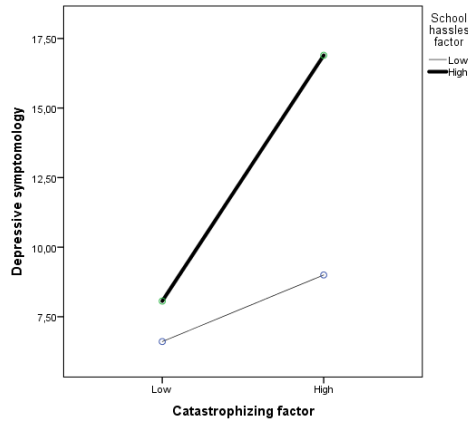


Figure 14. Graphic of the moderating effect of school hassles in the relationship between catastrophizing and depressive symptomology for the female sample.

When analysing the interaction term, we are able to observe that when the levels of catastrophizing are high, high levels on the school hassles factor lead to increased levels of depressive symptomology, compared to lower levels obtained on this DHMS factor. On the other hand, when catastrophizing levels are low, depressive symptoms appear to be lower regardless of the value obtained in the school hassles factor (high or low).

Other significant moderating effects for **school hassles** were found. This DHMS factor appears to have established a significant interaction term with more adaptive emotion regulation strategies such as **refocus on planning** ( $\beta = -.246, p < .05$ ) and **positive reappraisal** ( $\beta = -.226, p < .05$ ). All the designated variables were found to be significant **negative predictors of depressive symptomology** when analysed separately in interaction with the school hassles factor (see attachment - Tables [17](#) and [18](#)). In both cases, the statistically significant model produced in the third step (interaction term) indicated an increase in the percentage of variance explained in relation to the depressive symptomology. As for the interaction term between these variables, we can see that similar results were found for these variables when analysed for the prediction of depressive symptomology for the total sample (see attachment– Figures [15](#) and [16](#)).

#### 5.4.6. The moderating effect of peer hassles between emotion regulation strategies and depressive symptomology for the female sample

**Peer hassles** factor also produced a significant moderating effect for the female sample when in interaction with **brooding** ( $\beta = .258, p < .01$ ). Both variables were found to be significant **positive predictors of depressive symptomology** when analysed separately (brooding factor:  $\beta = .223, p < .05$ ; peer hassles factor:  $\beta = .463, p < .001$ ) (see Table 19).

Table 19. Regression coefficients of the three steps produced by a hierarchical multiple regression with brooding, peer hassles factor and the interaction term in the prediction of depressive symptomology in the female sample (N=80)

Model	Predictors	R2	F	$\beta$	t	P
1	Brooding factor	0,050	4,063	0,223	2,016	0,047
2	Brooding factor	0,233	11,722	0,049	0,456	0,650
	Peer hassles factor			0,463	4,298	,000
3	Brooding factor	0,286	10,161	0,051	0,486	0,628
	Peer hassles factor			0,579	5,014	,000
	Brooding factor * Peer hassles factor			-0,258	-2,373	0,020

As illustrated in the table above, the variables produced statistically significant models in all three steps: Model 1:  $R^2 = .05, F_{(1,78)} = 4.063, p < .05$ ; Model 2:  $R^2 = .233, F_{(2,77)} = 11.722, p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .286, F_{(3,76)} = 10.161, p < .001$ . In the third step (interaction term), the significant model produced show an increase in the percentage of variance explained in relation to depressive symptomology. Therefore, the interaction between the brooding and peer hassles produced a statistically significant coefficient (28.6%), indicating that the slope that predicts the change in depressive symptoms according to the brooding factor differs significantly depending on high or low peer hassles values.

A graphical representation the moderation effect was conducted (see Figure 17). Two levels (below and above average) were created for both the predictor and moderator variables. The chart allows us to verify that higher levels of brooding are associated with higher levels of depressive symptoms, and that lower levels obtained in the peer hassles factor predict lower levels of depressive symptomology.



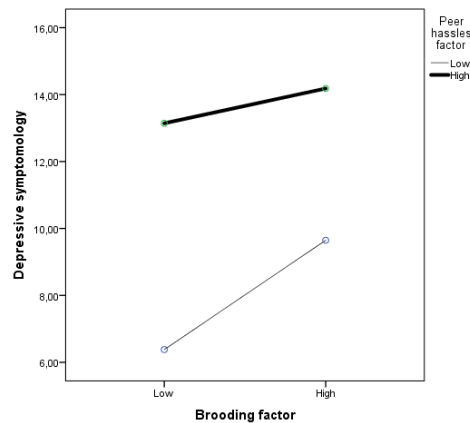


Figure 17. Graphic of the moderating effect of peer hassles in the relationship between brooding and depressive symptomatology for the female sample.

When analysing the interaction term, we are able to observe that when brooding levels are low, depressive symptoms appear to be lower, mostly when the value obtained in the peer hassles factor is low. On the other hand, when the levels of brooding are high, high levels on the school hassles factor lead to increased levels of depressive symptomatology, compared to lower levels obtained on this DHMS factor.

Other significant moderating effects for **peer hassles** were found. This DHMS factor appears to have established a significant interaction term with more adaptive emotion regulation strategies such as **refocus on planning** ( $\beta = -.260, p < .05$ ) and **positive reappraisal** ( $\beta = -.307, p < .05$ ). All the designated variables were found to be significant **negative predictors of depressive symptomatology** when analysed separately in interaction with the peer hassles factor (See Appendix - Tables [20](#) and [21](#)). In both cases, the statistically significant model produced in the third step (interaction term) indicated an increase in the percentage of variance explained in relation to the depressive symptomatology. As for the interaction term between these variables, we can see that similar results were found for these variables when analysed for the prediction of depressive symptomatology for the total sample (see attachment – Figures [18](#) and [19](#)).

#### 5.4.7. The moderating effect of DHMS factors (school hassles, peer hassles and resources hassles) between emotion regulation strategies and the composite index for the female sample

**Peer hassles** factor also produced a significant moderating effect for the female sample when in interaction with **brooding** ( $\beta = .258, p < .01$ ), in the prediction of the

composite index. Both variables were found to be significant **positive predictors of depressive symptomology** when analysed separately (brooding factor:  $\beta = .228, p < .01$ ; peer hassles factor:  $\beta = .47, p < .001$ ) (see Table 19).

Table 22. Regression coefficients of the three steps produced by a hierarchical multiple regression with brooding, peer hassles factor and the interaction term in the prediction of the composite index in the female sample (N=80)

Model	Predictors	R2	F	$\beta$	t	P
1	Brooding factor	0,091	7,780	0,301	2,789	0,007
2	Brooding factor	0,262	13,671	0,134	1,266	0,209
	Peer hassles factor			0,447	4,228	,000
3	Brooding factor	0,301	10,888	0,135	1,307	0,195
	Peer hassles factor			0,546	4,776	,000
	Brooding factor * Peer hassles factor			-0,220	-2,046	0,044

As illustrated in the table above, the variables produced statistically significant models in all three steps: Model 1:  $R^2 = .091, F_{(1,78)} = 7.780, p < .01$ ; Model 2:  $R^2 = .262, F_{(2,77)} = 13.671, p < .001$  and, lastly, the interaction term which was inserted in Model 3:  $R^2 = .301, F_{(3,76)} = 11.735, p < .001$ . In the third step (interaction term), the significant model produced show an increase in the percentage of variance explained in relation to depressive symptomology and psychosocial functioning. Therefore, the interaction between the brooding and peer hassles produced a statistically significant coefficient (**30.1%**), indicating that the slope that predicts the change in depressive symptoms and psychosocial functioning according to the brooding factor differs significantly depending on high or low peer hassles values.

A graphical representation the moderation effect was conducted (see Figure 20). Two levels (below and above average) were created for both the predictor and moderator variables. The chart allows us to verify that higher levels of brooding are associated with higher levels of depressive symptoms, and that lower levels obtained in the peer hassles factor predict lower levels of depressive symptomology.

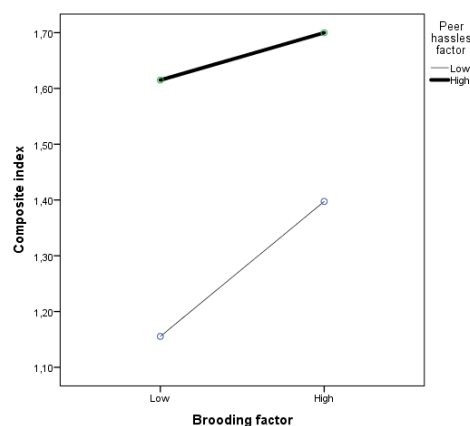


Figure 20. Graphic of the moderating effect of peer hassles in the relationship between brooding and depressive symptomatology and psychosocial functioning for the female sample.

When analysing the interaction term, we are able to observe that when brooding levels are low, depressive symptoms appear to be lower, mostly when the value obtained in the peer hassles factor is lower. On the other hand, when the levels of brooding are high, high levels on the peer hassles factor lead to increased levels of depressive symptomatology and psychosocial impairment, compared to lower levels obtained on this DHMS factor.

Other significant moderating effects for school hassles and resources hassles were found. **School hassles** appears to have established a significant interaction term with **refocus on planning** ( $\beta = -.250, p < .05$ ). Both variables were found to be **significant predictors of the composite index** when analysed separately (see attachment – Table 23). The statistically significant model produced in the third step (interaction term) indicated an increase in the percentage of variance explained in relation to the depressive symptomatology and psychosocial functioning. As for the interaction term between these variables, we can see that similar results were found for these variables when analysed for the prediction of composite index for the total sample (see attachment – Figure 21). With regards to the **resources hassles** factor, it was noted having a significant moderating effect when in interaction with the **blaming others** factor ( $\beta = .225, p < .05$ ), in the prediction of the composite index. Both variables were found to be significant **positive predictors of the composite index** when analysed separately (see attachment – Table 24). The statistically significant model produced in the third step (interaction term) indicated an increase in the percentage of variance explained in relation to the depressive symptomatology and psychosocial functioning. As for the interaction term between these variables, we can see that higher levels of blaming others are associated with higher levels of the composite index, and that lower levels obtained in the

resources hassles factor predict lower levels of the composite index. When analysing the interaction term, we are able to observe that when levels are low in the blaming other factor, depressive symptoms appear to be lower/psychosocial functioning more positive, mostly when the value obtained in the resources hassles factor is low. However, when the levels of blaming others are high, high levels on the resources hassles factor lead to increased levels of depressive symptomology/psychosocial impairment (see attachment – Figure [22](#)).

Most of the predictive and moderating effects obtained in this study were associated to depressive symptomology and the composite index. In order to promote a better understanding of the following section of this dissertation, we will refer to both of these variables as depressive symptomology and psychosocial functioning, with no further distinction.

## **6. Discussion**

Literature has made a distinction between adaptive and maladaptive emotion regulation strategies when investigating their relationship with depressive symptoms (Aldao, Nolen-Hoeksema, & Schweizer, 2010), especially among adolescents (Garnefski, Kraaij, & Van Etten, 2005; Garnefski & Kraaij, 2006; Yap, Allen, & Sheeber, 2007; Freire & Tavares, 2011; Yap et al., 2011; Zalewski, Lengua, Wilson, Trancik, & Bazinet, 2011; Duarte, Matos, & Marques, 2015). Maladaptive strategies such as self-blame and brooding have been highly associated to depressive symptomology in adolescents in previous cross-sectional investigations (Garnefski, Kraaij, & Van Etten, 2005; Muris & Ollendick, 2005; Garnefski & Kraaij, 2006; Eisenberg, Downs, Golberstein, & Zivin, 2009; Conceição & Carvalho, 2013), as well as longitudinal studies (Pitzer, Jennen-Steinmetz, Esser, & Laucht, 2011; Arnarson et al., 2015). Catastrophizing was also found to be used frequently among depressed adolescents in previous cross-sectional studies (Kraaij & Garnefski, 2002). Results obtained in this longitudinal study are in accordance with these findings. Brooding, catastrophizing and self-blame were found to be significant positive predictors of depressive symptomology and detrimental psychosocial functioning in both the total and female samples (as hypothesized in H4). No significant predictors were found for the male sample, and this absence could be explained by the reduced number of male adolescents participating in this study. As for more adaptive strategies such as positive reappraisal and positive refocusing, these have been found effective in the reduction of negative affect and improvement of

subjective and psychological well-being in adolescents faced with stressful events in previous cross-sectional studies (Gross, 1998; Kraaij & Garnefski, 2002; Freire & Tavares, 2011; Rood, Roelofs, Bögels, & Arntz, 2011; Duarte, Matos, & Marques, 2015). In consonance with these findings, positive reappraisal and positive refocusing were found to be effective strategies in the reduction of depressive symptomology and improvement of psychosocial functioning in adolescents in the present study (as hypothesized in H5). In addition, refocus on planning was also found to be a strong negative predictor of depressive symptomology and psychosocial impairment. Thus, adolescents who implemented more frequently the maladaptive emotion regulation strategies aforementioned revealed increased levels of depressive symptoms and worse psychosocial functioning levels, whereas the use of the adaptive strategies mentioned above led to lower levels of depressive symptoms and psychosocial impairment.

After controlling the variable gender, results suggested that girls presented higher rates of depressive symptomology and psychosocial impairment compared to boys, as hypothesized in H1 and stated in previous cross-sectional (Nolen-Hoeksema & Girgus, 1994; Bahls, 2002) and longitudinal studies (Ge, Conger, & Elder, 2001). As for the implementation of emotion regulation strategies, similar results were obtained as in previous cross-sectional investigations (Duarte, Matos, & Marques, 2015). Girls demonstrated higher levels of brooding when faced with adverse events, whereas boys showed a higher tendency to blame others. This could be explained by the fact that boys tend to implement more externalizing behaviours when compared to girls, who tend to internalize their problems (Pereira, Nunes, Lemos, Nunes, 2013). These tendencies result in different behaviours and attitudes concerning personal difficulties, and may be the reason why girls speak more freely about their problems and boys expose their negative emotions through aggressive and addictive behaviours (Gaspar et al., 2012). No statistically significant differences were found in daily hassles frequency when considering gender, contrary to what is hypothesized in H3 and found in previous cross-sectional investigations (Jose & Ratcliffe, 2004; Pereira, Nunes, Lemos, Nunes, 2013; Ruivo, Matos, & Oliveira, 2015).

Negative life events have also been accounted for as significant positive predictors of depressive symptomology in both cross-sectional (Goodyer, 1995; Dixon & Reid, 2000; Grant et al., 2006; Stroud et al., 2009; Pereira, Nunes, Lemos, & Nunes, 2013) and longitudinal studies (Ge, Conger, & Elder, 2001; Kim, Conger, Elder, & Lorenz, 2003; Cole, Nolen-Hoeksema, Girgus, & Paul, 2006; Hankin, Mermelstein, & Roesch, 2007), as well as

of general maladjustment (Jose & Ratcliffe, 2004). Results found in the present study are in accordance with literature, given that NLE appeared to be strong predictors of depressive symptomology and psychosocial impairment in the regression analysis conducted (as hypothesized in H6). Some noticeable results were produced regarding the NLE experienced by the sample of this study, having been reported adverse situations in the school, peer and family domains by both male and female adolescents, which is in accordance with past longitudinal (Seidman, Allen, & Aber, 2003; Hankin, Mermelstein, & Roesch, 2007) and cross-sectional investigations (Pereira, Nunes, Lemos, Nunes, 2013, Ruivo, Matos, & Oliveira, 2015). In addition, the resources hassles factor and an elevated total score on the DHMS scale were also found to be positive predictors of depressive symptomology and psychosocial impairment in this study sample.

The moderating effect of NLE in the relationship between emotion regulation strategies and depressive symptomology/psychosocial impairment in adolescents was found to be the main contribute of this investigation (as hypothesized in H7). When analysing the significant interaction effects, the presence of significant moderating effects of NLE, mostly in the school and peer domains, (T1) in the prediction of depressive symptomology and psychosocial impairment (T2) was noted, for the total sample, when in interaction with maladaptive emotion regulation strategies such as self-blame (T1), and for the female sample when in interaction with brooding and catastrophizing (T1). These results are in consonance with previous longitudinal investigations (Garnefski, Kraaij & Spinhoven, 2001; Arnarson et al., 2015), as well as other empirical cross-sectional studies (Nolen-Hoeksema e Girgus, 1994; Garnefski, Boon & Kraaij, 2003; Garnefski & Kraaij, 2006). Data analysis granted observations that are in accordance with previous cross-sectional studies and suggest that low levels of self-blame, catastrophizing and brooding function as a protective mechanism in the prevention of depressive symptomology and psychosocial impairment, operating as a buffering effect, particularly in stressful situations (Kraaij et al., 2003). On the other hand, when self-blame, catastrophizing and brooding levels are high, results obtained suggest that higher levels of NLE constitute a strong predictor of higher levels of depressive symptoms and psychosocial impairment. These results lead us to conclude that NLE, in general and in the school and peer domains, moderate the impact of self-blame, catastrophizing and brooding on depressive symptoms and psychosocial functioning. Therefore, an adolescent who presents a higher implementation rate of maladaptive strategies or greater difficulties in regulating his own emotions, when encountered with more NLE, is at greater risk of

developing depressive symptomology and psychosocial impairment. A possible explanation for this could be that the high levels of negative affect commonly observed in depressed youth, and that are directly related to psychosocial functioning (Judd et al., 2000), may lead to a lack of engagement in positive emotion coping responses and, therefore, report a higher implementation of maladaptive strategies (Yap et al., 2011). The meaning attribution styles as well as the depressogenic cognitive style that could result from the continuity of the general negative affect experienced could increase levels of NLE (Hankin et al., 2004) which, in this developmental stage, have already a natural tendency to increase and, therefore, lead to higher levels of depressive symptomology and psychosocial impairment (Dixon & Reid, 2000).

The moderating effects obtained in this study also suggest that the female sample has a higher tendency to implement more maladaptive strategies such as brooding and catastrophizing, when compared to the total and male samples (as hypothesized in H2). In other words, there seems to be a higher propensity for these adolescent girls to focus and dwell upon adverse events and emphasize the disastrous effect that these may have. In addition, it is possible that the results obtained for self-blame in the total sample may have been skewed by gender due to the size of the female sample, and also based on the predictive results obtained for the male sample in this study regarding emotion regulation strategies, which were null.

Significant interaction terms were also observed for adaptive emotion regulation strategies. When analysing the significant interaction effects, the presence of a significant moderating effect of NLE in the prediction of depressive symptomology and psychosocial impairment was noted, for both the total and female samples, when in interaction with positive reappraisal, refocus on planning and positive refocusing. Data analysis suggests that high levels of positive reappraisal, refocus on planning and positive refocusing function as protective and buffering factors in the development of depressive symptomology and psychosocial impairment, given that high or low levels of NLE do not seem to produce significant differences on the depressive symptomology and psychosocial functioning levels. However, when positive reappraisal, refocus on planning and positive refocusing levels are low, results suggest that a higher frequency of NLE, in general and in the school and peer domains, constitute a strong predictor of higher levels of depressive symptoms and psychosocial impairment. These results are congruent with previous findings regarding the buffering effect and significant negative relationship established between positive reappraisal and depressive symptomology, since high levels of positive reappraisal have been

significantly associated to low levels of depressive symptoms (Garnefski, Boon & Kraaij, 2003).

All the above results suggest that cognitive emotion regulation strategies in interaction with NLE may function as a risk or protective mechanism in the development of depressive symptomology and increase in the psychosocial impairment in adolescents. In general terms, the sample used in this study obtained low values for depressive symptomology and high levels for psychosocial functioning, and this may have influenced the results observed. If we had resorted to a clinical sample, it is possible that the tendencies found would have been accentuated. Nevertheless, the implementation of self-blame, brooding and catastrophizing, when faced with adverse events, has been shown to lead to higher levels of depression and detrimental psychosocial functioning. One possible explanation for this may be that these maladaptive strategies interfere with the adolescents' ability to manage emerging situations more efficiently, thus leading to the development of depressive symptomology or aggravating existing symptoms by increasing the individuals' vulnerability to stress (Nolen-Hoeksema, 2001). The same author also found that depression may contribute to an increase in the probability of occurrence of adverse life events. On the other hand, adaptive strategies such as positive reappraisal, refocus on planning and positive refocusing have been shown to reduce depressive symptomology and psychosocial impairment experienced when faced with an adverse situation, by reducing the depressogenic effect of the situation. Kim, Conger, Elder & Lorenz (2003) propose another reciprocal theory to explain the results obtained, making reference to a mutually reinforcing process existing between NLE and general maladjustment. These authors postulate that NLE promote emotional distress and maladaptive behaviours and responses, which constitute the individuals' maladjustment, and that these emotional alterations and consequent attitudes may increase daily life stress and its impact. Therefore, an increase in daily stress levels can lead to an increment in already existing emotional distress and maladaptive behaviours and attitudes, possibly influencing problem solving skills and coping mechanisms when dealing with NLE and, thus, aggravating the adolescents' general maladjustment.

As for clinical implications, this study brings a better understanding of the risk factors involved in the development of depression in adolescence, especially with regards to emotion regulation strategies and how they are implemented by adolescents when a stressful event is encountered. Intervention programmes should focus on educating and training the use of more adaptive emotion regulation strategies, seeing that some of these results could be due



to the lack of a sufficient repertoire of adaptive strategies (Garnefski & Kraaij, 2006), or their incorrect implementation (Ge, Conger, & Elder, 2001). The main objective behind these kind of programmes is to improve adolescents' emotional capability to deal better with stressful and uncontrollable events in their daily lives. It would also be important, with this education-based programme, to help adolescents avoid NLE that are controllable and preventable. Prevention programmes should target younger adolescents, essentially, in order to stimulate the maintenance and improvement of their repertoire of emotion regulation strategies and challenge and prevent the use of maladaptive ones.

In spite of the longitudinal design of this study and the caution used in the collection and analysis of the data obtained through both quantitative and qualitative measures, it does present some limitations worth mentioning. The small sample size and its constitution (mostly female participants), as well as geographical restrictions, are delimiting factors for data generalization to the Portuguese population. The sample used was also a community sample, lacking properties that permit comparison to clinical samples. As for procedures performed in data collection, some variables may have influenced the responses obtained on the self-response questionnaires as well as the interviews conducted by the research team, such as lack of motivation and, consequently, adhesion due to the extension of the research protocol used. In the future, larger and more balanced samples (in terms of gender) should be recruited for further development, as well as clinical samples.

In future investigations, it would be interesting to investigate the sociocultural influence of certain factors such as parents' marital and socioeconomic status, as well as their educational and professional backgrounds, and how these components and their impact influence emotion regulation strategies and other coping mechanisms in the development of depressive symptomology in adolescence. It would also be intriguing to replicate this study and analyse the relationship between negative life events and positive life events, and even the relationship between emotion regulation strategies and positive life events in the development of depression.

In conclusion, the results of this study were extensive and allowed us to identify important moderating mechanisms that may contribute to the longitudinal development of depressive symptomology and psychosocial impairment in adolescents. To be more precise, NLE in the school and peer domains seem to have a strong predicting effect of depressive symptomology and psychosocial functioning, especially when the adolescent implements

emotion regulation strategies such as self-blame, brooding and catastrophizing. On the hand, the implementation of positive reappraisal, positive refocusing and refocus on planning seem to have a more beneficial impact on the adolescents' emotional state and psychosocial functioning, when faced specifically with adverse events in the school and peer domains.

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## 8. Attachments

Table 2 – Analysis of Pearson correlations between CDI, Composite index, Psychosocial functioning, CERQ factors and DHMS factors and total score (N=117)

	CDI (T2)	Composite index (T2)	Psychosocial functioning (T2)	DHMS F1 (T1)	DHMS F2 (T1)	DHMS F3 (T1)	DHMS F4 (T1)	DHMS F5 (T1)	DHMS total (T1)
CDI (T2)	-	,868**	,462**	,461**	,374**	,467**	,262**	,291**	,497**
Composite index (T2)	,868**	-	,841**	,461**	,478**	,479**	,246**	,323**	,533**
Psychosocial functioning (T2)	,462**	,841**	-	,322**	,447**	,347**	,155	,261**	,411**
CERQ F1 (T1)	,568**	,466**	,215*	,365**	,223*	,350**	,164	,209*	,353**
CERQ F2 (T1)	,130	,157	,139	,174	,270**	,195*	,196*	,086	,243**
CERQ F3 (T1)	,241**	,228*	,145	,279**	,160	,312**	,161	,061	,261**
CERQ F4 (T1)	,389**	,404**	,299**	,381**	,398**	,270**	,304**	,198*	,407**
CERQ F5 (T1)	-,073	-,069	-,045	-,001	-,071	-,031	-,030	-,096	-,062
CERQ F6 (T1)	-,294**	-,277**	-,173	-,165	-,274**	-,250**	-,179	-,315**	-,319**
CERQ F7 (T1)	-,272**	-,268**	-,183*	-,187*	-,269**	-,240**	-,127	-,335**	-,313**
CERQ F8 (T1)	,071	,028	-,028	,050	-,093	-,089	-,103	-,075	-,084
CERQ F9 (T1)	-,261**	-,260**	-,180	-,122	-,276**	-,229*	-,203*	-,366**	-,322**

\*\*The correlation is significant at the 0.01 level (bilateral). \*The correlation is significant at the 0.05 level (bilateral). Composite index = Depressive symptomology and Psychosocial functioning; CDI = Children's Depression Inventory; Psychosocial functioning = Adolescent- Longitudinal Interval Follow-up Evaluation; CERQ\_F1 = Self-blame factor; CERQ\_F2 = Blaming others factor; CERQ\_F3 = Brooding factor; CERQ\_F4 = Catastrophizing factor; CERQ\_F5 = Putting into perspective factor; CERQ\_F6 = Positive refocusing factor; CERQ\_F7 = Positive reappraisal factor; CERQ\_F8 = Acceptance factor; CERQ\_F9 = Refocus on planning factor; DHMS 1 = School hassles factor; DHMS 2 = Family hassles factor; DHMS 3 = Neighbourhood hassles factor; DHMS 4 = Peer hassles factor; DHMS 5 = Resources hassles factor; DHMS total = Daily Hassles Microsystem Scale.

Table 5. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, school hassles factor and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R <sup>2</sup>	F	β	t	P
1	Refocus on planning factor	0,068	8,427	-0,261	-2,903	0,004
2	Refocus on planning factor	0,255	19,506	-0,208	-2,556	0,012
	School hassles factor			0,435	5,345	,000
3	Refocus on planning factor	0,293	5,640	-0,190	-2,375	0,019
	School hassles factor			0,414	5,159	,000
	Refocus on planning * School hassles factor			-0,198	-2,479	0,015

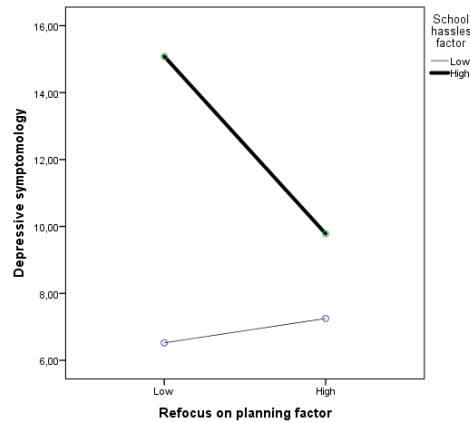


Figure 3. Graphic of the moderating effect of school hassles in the relationship between refocus on planning and depressive symptomology

Table 6. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive reappraisal, school hassles factor and the interaction term in the prediction of depressive symptomology (N=118)

Model	Predictors	R2	F	$\beta$	t	p
1	Positive reappraisal factor	0,074	9,178	-0,272	-3,030	0,003
2	Positive reappraisal factor	0,248	18,795	-0,192	-2,327	0,022
	School hassles factor			0,425	5,137	,000
3	Positive reappraisal factor	0,291	15,424	-0,171	-2,110	0,037
	School hassles factor			0,368	4,411	,000
	Positive reappraisal factor *School hassles factor			-0,216	-2,603	0,010

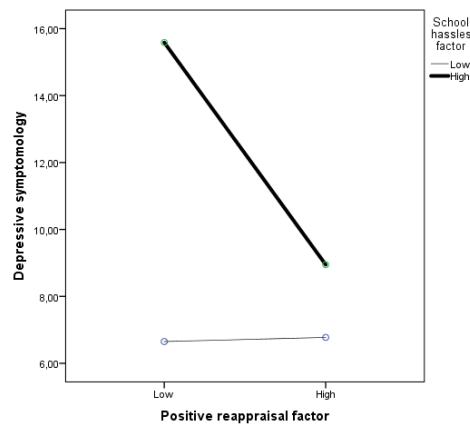


Figure 4. Graphic of the moderating effect of school hassles in the relationship between positive reappraisal and depressive symptomology

Table 7. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive refocusing, peer hassles factor and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R <sup>2</sup>	F	$\beta$	t	p
1	Positive refocusing factor	0,087	10,919	-0,294	-3,304	0,001
2	Positive refocusing factor	0,252	19,168	-0,190	-2,266	0,025
	Peer hassles factor			0,419	5,013	,000
3	Positive refocusing factor	0,285	15,025	-0,195	-2,368	0,020
	Peer hassles factor			0,351	4,020	,000
	Positive refocusing factor *Peer hassles factor			-0,195	-2,301	0,023

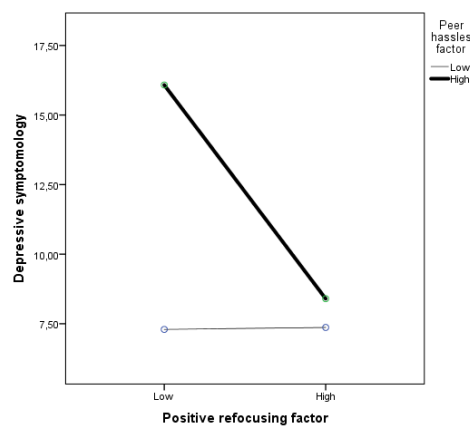


Figure 5. Graphic of the moderating effect of peer hassles in the relationship between positive refocusing and depressive symptomology

Table 8. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, peer hassles factor and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R <sup>2</sup>	F	B	t	p
1	Refocus on planning factor	0,68	8,427	-0,261	-2,903	0,004
2	Refocus on planning factor	0,243	18,311	-0,163	-1,948	0,054
	Peer hassles factor			0,430	5,132	,000
3	Refocus on planning factor	0,302	16,298	-0,109	-1,325	0,188
	Peer hassles factor			0,350	4,124	0,001
	Refocus on planning factor *Peer hassles factor			-0,265	-3,087	0,003

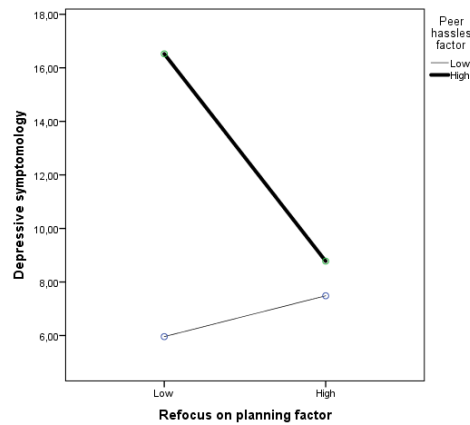


Figure 6. Graphic of the moderating effect of peer hassles in the relationship between refocus on planning and depressive symptomology

Table 9. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive reappraisal, peer hassles factor and the interaction term in the prediction of depressive symptomology (N=117)

Model	Predictors	R <sup>2</sup>	F	B	t	p
1	Positive reappraisal factor	0,074	9,178	-0,272	-3,030	0,003
2	Positive reappraisal factor	0,245	18,501	-0,170	-2,023	0,045
	Peer hassles factor			0,426	5,083	,000
3	Positive reappraisal factor	0,322	17,924	-0,130	-1,621	0,108
	Peer hassles factor			0,333	3,974	0,000
	Positive reappraisal factor * Peer hassles factor			-0,299	-3,592	0,000

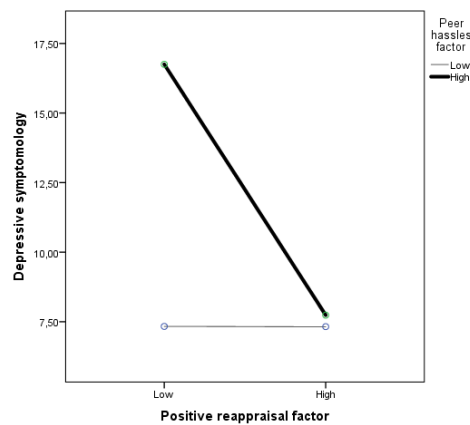


Figure 7. Graphic of the moderating effect of peer hassles in the relationship between positive reappraisal and depressive symptomology

Table 10. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, school hassles factor and the interaction term in the prediction of the composite index (N=117)

Model	Predictors	R2	F	B	t	p
1	Refocus on planning factor	0,067	8,322	-0,260	-2,885	0,005
2	Refocus on planning factor	0,254	19,455	-0,207	-2,536	0,013
	School hassles factor			0,436	5,347	,000
3	Refocus on planning factor	0,284	14,973	-0,191	-2,368	0,020
	School hassles factor			0,416	5,162	,000
	Refocus on planning factor *School hassles factor			-0,175	-2,176	0,032

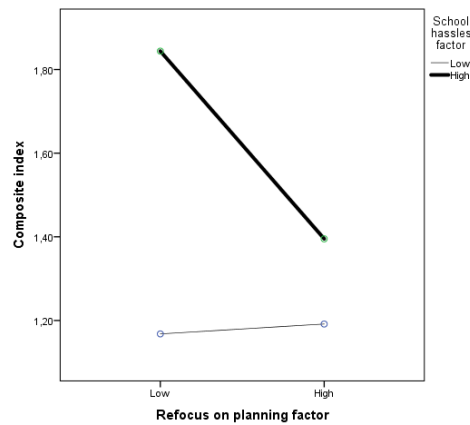


Figure 8. Graphic of the moderating effect of school hassles in the relationship between refocus on planning and depressive symptomatology and psychosocial functioning

Table 11. Regression coefficients of the three steps produced by a hierarchical multiple regression with acceptance, peer hassles factor and the interaction term in the prediction of the composite index (N=117)

Model	Predictors	R2	F	$\beta$	t	p
1	Acceptance factor	0,001	0,088	0,028	0,296	0,768
2	Acceptance factor	0,234	17,437	0,071	0,861	0,391
	Peer hassles factor			0,485	5,896	,000
3	Acceptance factor	0,264	13,491	0,073	0,906	0,367
	Peer hassles factor			0,453	5,494	,000
	Acceptance factor *Peer hassles factor			-0,175	-2,126	0,036

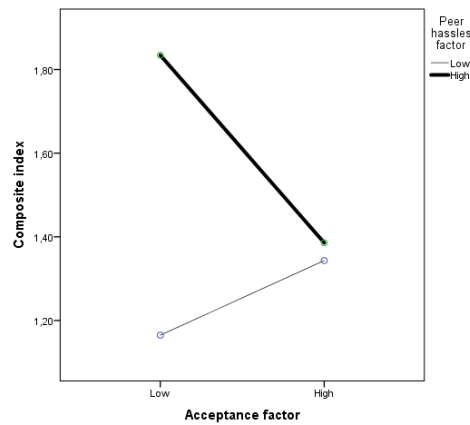


Figure 9. Graphic of the moderating effect of peer hassles in the relationship between acceptance and depressive symptomology and psychosocial functioning

Table 12. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive refocusing, peer hassles factor and the interaction term in the prediction of the composite index (N=117)

Model	Predictors	R <sup>2</sup>	F	B	t	p
1	Positive refocusing factor	0,076	9,520	-0,277	-3,085	0,003
2	Positive refocusing factor	0,256	19,562	-0,167	-2,004	0,047
	Peer hassles factor			0,437	5,236	,000
3	Positive refocusing factor	0,282	14,820	-0,172	-2,086	0,039
	Peer hassles factor			0,376	4,295	,000
	Positive refocusing factor *Peer hassles factor			-0,175	-2,056	0,042

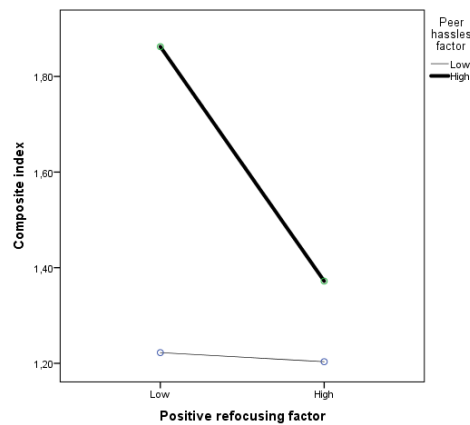


Figure 10. Graphic of the moderating effect of peer hassles in the relationship between positive refocusing and depressive symptomology and psychosocial functioning



Table 13. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, peer hassles factor and the interaction term in the prediction of the composite index (N=117)

Model	Predictors	R2	F	B	t	p
1	Refocus on planning factor	0,067	8,322	-0,260	-2,885	0,005
2	Refocus on planning factor	0,253	19,316	-0,159	-1,907	0,059
	Peer hassles factor			0,443	5,323	,000
3	Refocus on planning factor	0,290	15,384	-0,116	-1,394	0,166
	Peer hassles factor			0,379	4,436	,000
	Refocus on planning *Peer hassles factor			-0,210	-2,423	0,017

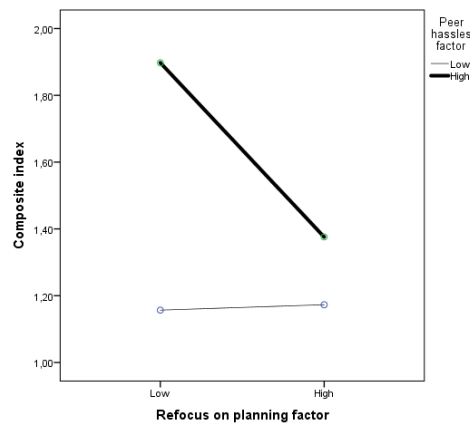


Figure 11. Graphic of the moderating effect of peer hassles in the relationship between refocus on planning and depressive symptomatology and psychosocial functioning

Table 14. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive reappraisal, peer hassles factor and the interaction term in the prediction of the composite index (N=117)

Model	Predictors	R2	F	B	t	p
1	Positive reappraisal factor	0,072	8,894	-0,268	-2,982	0,003
2	Positive reappraisal factor	0,254	19,419	-0,162	-1,948	0,054
	Peer hassles factor			0,440	5,279	,000
3	Positive reappraisal factor	0,293	15,593	-0,135	-1,638	0,104
	Peer hassles factor			0,374	4,368	,000
	Positive reappraisal factor *Peer hassles factor			-0,211	-2,485	0,014

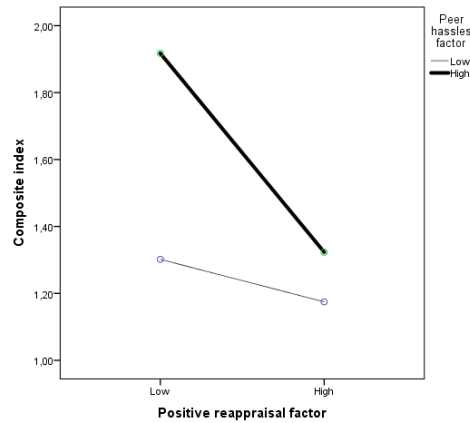


Figure 12. Graphic of the moderating effect of peer hassles in the relationship between positive reappraisal and depressive symptomatology and psychosocial functioning

Table 17. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, school hassles factor and the interaction term in the prediction of depressive symptomatology for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	B	t	p
1	Refocus on planning factor	0,101	8,771	-0,318	-2,962	0,004
2	Refocus on planning factor	0,303	16,771	-0,263	-2,743	0,008
	School hassles factor			0,453	4,730	,000
3	Refocus on planning factor	0,361	14,327	-0,214	-2,272	0,026
	School hassles factor			0,445	4,818	,000
	Refocus on planning factor *School hassles factor			-0,246	-2,623	0,011

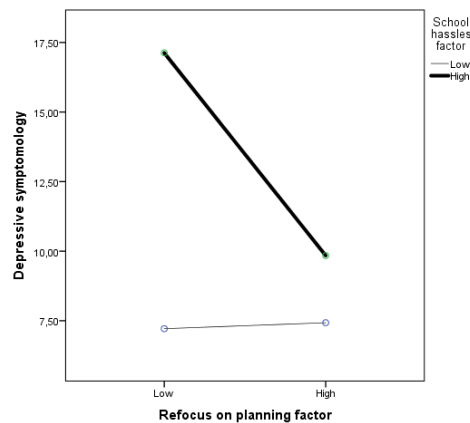


Figure 15. Graphic of the moderating effect of school hassles in the relationship between refocus on planning and depressive symptomatology for the female sample

Table 18. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive reappraisal, school hassles factor and the interaction term in the prediction of depressive symptomology for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	B	t	p
1	Positive reappraisal factor	0,082	7,009	-0,287	-2,647	0,010
2	Positive reappraisal factor	0,277	14,767	-0,208	-2,112	0,038
	School hassles factor			0,448	4,555	,000
3	Positive reappraisal factor	0,326	12,231	-0,169	-1,743	0,085
	School hassles factor			0,420	4,349	,000
	Positive reappraisal factor * School hassles factor			-0,226	-2,335	0,022

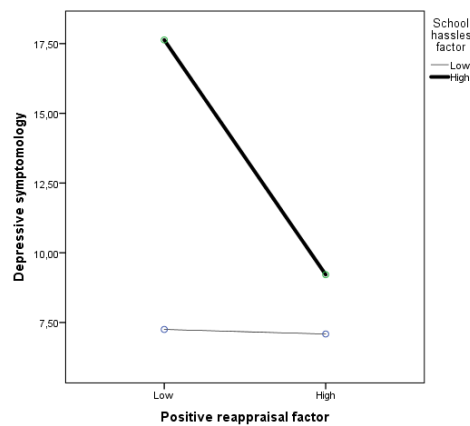


Figure 16. Graphic of the moderating effect of school hassles in the relationship between positive reappraisal and depressive symptomology for the female sample

Table 20. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, peer hassles factor and the interaction term in the prediction of depressive symptomology for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	$\beta$	t	p
1	Refocus on planning factor	0,101	8,771	-0,318	-2,962	0,004
2	Refocus on planning factor	0,266	13,974	-0,195	-1,916	0,059
	Peer hassles factor			0,425	4,164	,000
3	Refocus on planning factor	0,320	11,920	-0,122	-1,185	0,240
	Peer hassles factor			0,351	3,392	0,001
	Refocus on planning factor *Peer hassles factor			-0,260	-2,449	0,017

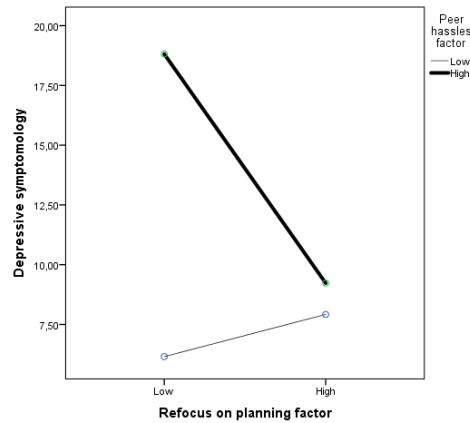


Figure 18. Graphic of the moderating effect of peer hassles in the relationship between refocus on planning and depressive symptomatology for the female sample

Table 21. Regression coefficients of the three steps produced by a hierarchical multiple regression with positive reappraisal, peer hassles factor and the interaction term in the prediction of depressive symptomatology for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	$\beta$	t	p
1	Positive reappraisal factor	0,082	7,009	-0,287	-2,647	0,0010
2	Positive reappraisal factor	0,254	13,101	-0,157	-1,526	0,131
	Peer hassles factor			0,434	4,206	,000
3	Positive reappraisal factor	0,333	12,659	-0,116	-1,173	0,244
	Peer hassles factor			0,329	3,163	0,002
	Positive reappraisal factor * Peer hassles factor			-0,307	-3,007	0,004

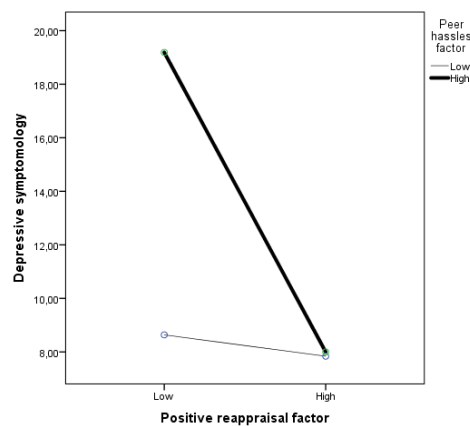


Figure 19. Graphic of the moderating effect of peer hassles in the relationship between positive reappraisal and depressive symptomatology for the female sample

Table 23. Regression coefficients of the three steps produced by a hierarchical multiple regression with refocus on planning, school hassles factor and the interaction term in the prediction of the composite index for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	$\beta$	t	p
1	Refocus on planning factor	0,085	7,241	-0,291	-2,691	0,009
2	Refocus on planning factor	0,282	15,143	-0,237	-2,437	0,017
	School hassles factor			0,448	4,601	,000
3	Refocus on planning factor	0,342	13,178	-0,187	-1,960	0,054
	School hassles factor			0,439	4,686	,000
	Refocus on planning factor * School hassles factor			-0,250	-2,631	0,010

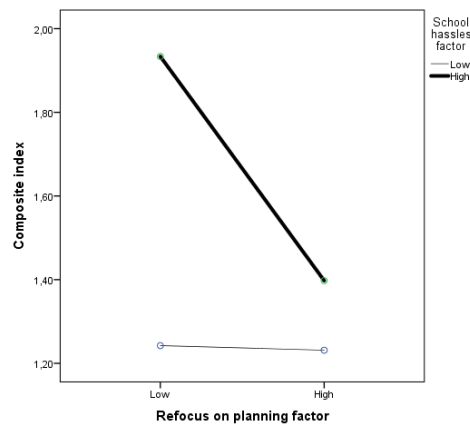


Figure 21. Graphic of the moderating effect of school hassles in the relationship between refocus on planning and depressive symptomology and psychosocial functioning for the female sample

Table 24. Regression coefficients of the three steps produced by a hierarchical multiple regression with blaming others, resources hassles factor and the interaction term in the prediction of the composite index for the female sample (N=80)

Model	Predictors	R <sup>2</sup>	F	$\beta$	t	p
1	Blaming others factor	0,030	2,412	0,173	1,553	0,124
2	Blaming others factor	0,113	4,895	0,139	1,288	0,201
	Resources hassles factor			0,290	2,681	0,009
3	Blaming others factor	0,160	4,810	0,183	1,692	0,095
	Resources hassles factor			0,238	2,184	0,032
	Blaming others factor * Resources hassles factor			-0,225	-2,057	0,043

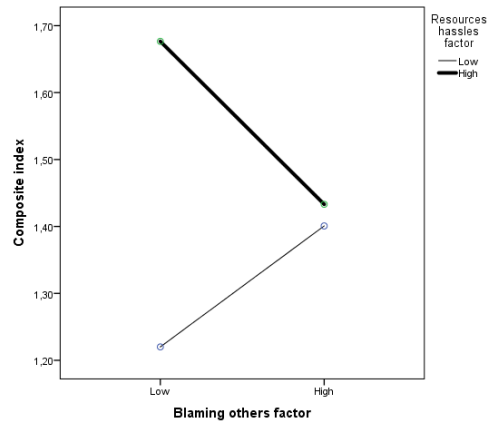


Figure 22. Graphic of the moderating effect of resources hassles in the relationship between blaming others and depressive symptomatology and psychosocial functioning for the female sample