

This is the authors' version of: Blöte, A. W. & Westenberg, P. M. (2019). The temporal association between emotional clarity and depression symptoms in adolescents. *Journal of Adolescence*, 71, 110-118. DOI: [10.1016/j.adolescence.2019.01.005](https://doi.org/10.1016/j.adolescence.2019.01.005)

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The temporal association between emotional clarity and depression symptoms in adolescents

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Declarations of interest: none

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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## Abstract

**Introduction:** Low emotional clarity, that is, problems in understanding and identifying one's own emotions, is generally seen as related to depression. Most empirical studies on this topic focused on the link between low levels of emotional clarity predicting depression problems, fewer studies on depression symptoms predicting low emotional clarity. All studies were restricted to unidirectional associations. The present study evaluated the reciprocal associations between emotional clarity and depression symptoms. Additionally, we tested the role of rumination as a mediator of the links between depression symptoms and emotional clarity.

**Methods:** For the main analyses, data of 230 Dutch participants ( $M_{\text{age}} = 13.40$ ,  $SD = 2.24$ ; 48% girls) over three time points of a 5-year longitudinal study were used. Depression symptoms, emotional clarity, and rumination were self-reported. Cross-lagged panel analysis was used to test a model of reciprocal associations between depression symptoms and emotional clarity against models of unidirectional associations. The role of rumination as mediator and sex as moderator in the links between depression symptoms and emotional clarity were evaluated in separate analyses on a subsample ( $n = 151$ ).

**Results & Conclusions:** A model of reciprocal associations where depression symptoms and low emotional clarity predict relatively high scores of the other over time offered a good representation of the data. Rumination mediated the link between depression symptoms predicting prospective emotional clarity for both sexes. These findings suggest a vicious cycle between depression symptoms and low emotional clarity. We discuss possible implications of these results for the treatment of depression in youth.

The present study aims to further our insight into the longitudinal relationship between depression symptoms, emotional clarity, and rumination in (pre-)adolescents. Adolescence is a relatively vulnerable age as far as the development of depression is concerned. Two large epidemiologic studies in the U.S. reported a point prevalence rate of depression symptoms in youth of respectively 20 and 30% and a rate of clinical levels of depression of nearly 9% (Rushton, Forcier, & Schectman, 2002; Saluja et al., 2004). In adolescence, depression increases with age (Saluja et al., 2004) and is more frequent in girls than boys (Hilt & Nolen-Hoeksema, 2009; Saluja et al., 2004). One of the possible reasons for adolescents becoming depressed is that they experience more emotional stress than children and also become more sensitive to emotional stress which may result in inflated reactions to it and, ultimately, the development of psychopathology (Spear, 2009). For that reason, knowledge about adolescents' responses to emotional stress may increase our insight into the development of depression in adolescence. A factor associated with responses to emotional stress and depression is emotional clarity.

Emotional clarity is an important facet of emotional awareness and involves identifying and understanding of one's own emotional experiences (Gohm & Clore, 2000, 2002). Individuals with an adequate level of emotional clarity are able to recognize their emotions and to distinguish them from other emotions (Flynn & Rudolph, 2014; Gohm & Clore, 2000, 2002). For example, in a stressful social situation these individuals can distinguish feelings of anger from feelings of anxiety or depression. Evidently, if individuals in an emotionally stressful situation understand their own feelings, chances are better that they will choose an effective strategy for dealing with that situation. Emotional clarity enables an individual to adaptively respond to emotional stress (Flynn & Rudolph, 2014; McLaughlin, Hatzenbuehler, Mennin, & Nolen-Hoeksema, 2011), while low emotional clarity is associated with internalizing problems such as anxiety and depression (Zeman, Cassano, Perry-Parrish, & Stegall, 2006; Zeman, Shipman, & Suveg, 2002). With regards to the development of emotional clarity in adolescence no clear picture can be drawn, because only few studies examined age effects. One of these studies found that emotional clarity increases during adolescence (Rubenstein et al., 2015) and two others that it is stable in boys and decreases in girls (Gomez-Baya, Mendoza, Paino, & de Matos, 2017; Haas et al., 2018). Furthermore, adolescent boys have higher emotional clarity than girls (Extremera, Durán, & Rey, 2007; Haas et al., 2018; Rubenstein et al., 2015). Because emotions play a more important role in the social interactions of adolescent girls than boys and

the complexity of social interactions increases across the adolescent years, it may become more challenging for girls to correctly identify and understand their emotions (Haas et al., 2018).

Rumination has been described both in the context of coping and emotion regulation. Coping and emotion regulation are considered closely related regulatory processes (Compas et al., 2017). The main difference between these constructs is that in coping theory the regulatory processes are defined as a response to a stressor while in emotion regulation theory they are defined as a response to emotional arousal regardless of the stressor that caused this emotional arousal (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Thompson, 1994). As a coping strategy rumination is characterized by repetitive reviewing of a stressful situation, with special attention paid to one's (negative) cognitive, and emotional experiences and their causes and consequences (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Rose & Rudolph, 2006; Schäfer, Naumann, Holmes, Tuschen-Caffier, & Samson, 2017; Wong, 2016). As such it is part of a broader category of involuntary engagement coping strategies (Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000). In the context of emotion regulation, rumination is defined as repetitively focusing on one's (negative) mood, on its causes, meaning, and consequences (Nolen-Hoeksema, 1991). Importantly, the two definitions have a pivotal common factor, namely that rumination is a "process of thinking perseveratively about one's feelings and problems rather than in terms of the specific content of thoughts" (Nolen-Hoeksema et al., 2008, p. 400). There is much evidence that adolescent girls ruminate more than boys (e.g., Hampel & Petermann, 2005; Jose & Brown, 2008) and also co-ruminate more, repetitively talking problems over with their friends (Rose & Rudolph, 2006). One study found that in a group of pre- and young adolescents rumination increases with age (Hampel & Petermann, 2005).

Ruminative thinking is associated with internalizing psychopathology such as anxiety and depression (Liverant, Kamholz, Sloan, & Brown, 2011; McLaughlin & Nolen-Hoeksema, 2011). However, not much is known about the mechanisms explaining the processes and consequences of ruminative thinking. In some studies, rumination has been linked to emotion suppression, an emotion regulation strategy that is the opposite of emotion acceptance. By repetitively experiencing a negative emotion or situation, processing of the corresponding, too painful initial emotion would be suppressed or avoided and, as a consequence, the development of emotional clarity prevented (Liverant et al., 2011). From a different perspective, rumination has also been

associated with memory processes, in particular with the inability to remove negative information from working memory (Joormann & Gotlib, 2008) and more generally with manipulating negative emotion material, which may prevent that new associations with a more positive content are formed (Joormann, Levens, & Gotlib, 2011). It has also been hypothesized that individuals who ruminate have less resources left to engage in unravelling their emotions. Their “sticky thoughts” (Joormann et al., 2011, p. 979) prevent them from taking a different viewpoint in considering their problems (Gohm & Clore, 2000, 2002; Rubenstein et al., 2015). In short, there are (at least) three different explanations of the underlying mechanisms of rumination and they seem to complement rather than exclude each other.

We reviewed the literature for studies on the relation between emotional clarity and depression symptoms in youth. Because we are interested in how depression symptoms and emotional clarity predict each other over time we focused on longitudinal studies. We also paid attention to the role of coping style or emotion regulation strategy in the emotional-clarity depression-symptoms link. Eight studies were found that examined the role of emotional clarity as a predictor of changes in future depression. The time intervals in these studies varied from half a year to five years. Five of these studies measured emotional clarity using the Emotional Clarity Questionnaire (ECQ; Flynn & Rudolph, 2010). The remaining three studies used different measures of emotional clarity. Rieffe and De Rooij (2012) used the Emotional Awareness Questionnaire (EAQ; Rieffe, Oosterveld, Miers, Terwogt, & Ly, 2008) which has a subscale “Differentiating Emotions” that is very similar to the ECQ. Gomez-Baya et al. (2017) used the Trait Meta-Mood scale (Fernández-Berrocal, Extremera, & Ramos, 2004) that includes a subscale “Perceived Emotional Clarity”. Finally, Kranzler et al. (2016) used a measure combining emotional awareness and emotional understanding from the Emotional Expression Scale for Children, the EESC (Penza-Clyve & Zeman, 2002). In the majority of studies (Gomez-Baya et al., 2017; Haas et al., 2018; Kranzler et al., 2016; Rieffe & De Rooij, 2012; Stange, Alloy, Flynn, & Abramson, 2013; Stange, Boccia, et al., 2013) depression symptoms were measured with the Children’s Depression Inventory (Kovacs, 1985). In two studies (Flynn & Rudolph, 2010, 2014), the short form of the Mood and Meta-Feelings Questionnaire was used (SMFQ; Angold, Costello, Messer, & Pickles, 1995). All these studies found that low levels of emotional clarity predicted an increase of depression symptoms, be it in samples of pre-adolescents (Flynn & Rudolph, 2010, 2014; Rieffe & De Rooij, 2012) adolescents (Gomez-Baya et al., 2017; Haas et

al., 2018; Stange, Alloy, et al., 2013; Stange, Boccia, et al., 2013), or both pre-adolescents and adolescents (Kranzler et al., 2016). With regards to differences between the sexes, three of the four studies that included sex as a moderating variable found that the prospective relation between emotional clarity and depression symptoms was not different between boys and girls (Haas et al., 2018; Kranzler et al., 2016; Rieffe & De Rooij, 2012). The fourth study found that only in girls a decrease of emotional clarity predicted an increase of depression symptoms (Gomez-Baya et al., 2017).

Two of the reviewed studies examined the mediating effect of coping style on the emotional-clarity depression-symptoms link. These studies included engagement coping and involuntary coping, measured with the Responses to Stress Questionnaire (RSQ; Connor-Smith et al., 2000), as possible mediators (Flynn & Rudolph, 2010, 2014). Engagement coping reflects active, approach-oriented responses to stress such as problem solving or expression of negative stress-related emotions. Involuntary coping refers to automatic responses such as rumination, emotional numbing, or physiological arousal. It was found that both low engagement coping and high involuntary coping (partly) mediated the link between emotional clarity and depression symptoms (Flynn & Rudolph, 2010, 2014). These mediation effects did not differ between boys and girls (Flynn & Rudolph, 2014).

As far as we are aware, only one study investigated the (reverse) effect of depression symptoms on later emotional clarity. This study utilized young adolescents in the ages of 12 to 13 years old (Rubenstein et al., 2015). Emotional clarity was assessed with the ECQ (Flynn & Rudolph, 2010) and depression symptoms with the CDI (Kovacs, 1985). The study found that depression symptoms predicted a decrease of emotional clarity over an interval of two years. In girls, this relation was mediated by rumination as measured with the Children's Response Styles Questionnaire (CRSQ; Abela, Vanderbilt, & Rochon, 2004).

In sum, there is evidence for low levels of emotional clarity predicting an increase of prospective depression symptoms and, based on one study, for depression symptoms predicting a decrease of prospective emotional clarity levels. We found no studies that looked into reciprocal associations between emotional clarity and depression over time. The literature up to now shows a strong tendency to picture low emotional clarity as a risk factor for the development of

depression symptoms. By taking this one-sided perspective, clinically important insights into reciprocal effects of emotional clarity and depression symptoms may be missed.

The present study aimed to extend on the previous studies by evaluating which model fits the development of emotional clarity and depression symptoms best, a model where low emotional clarity levels predict an increase of later depression symptoms, a model where depression symptoms predict a decrease of emotional clarity levels, or a model of reciprocal associations where low emotional clarity and depression symptoms predict relatively high scores of the other over time (Research question 1). We investigated the longitudinal relationship between emotional clarity and depression symptoms in a four-wave study covering a 5-year time interval. Based on the literature on unidirectional effects as reviewed above, it was expected that depression symptoms and low emotional clarity would mutually predict each other over time, that is to say that a model of reciprocal associations would describe the data best. Additionally, we evaluated the mediating role of an inadequate coping style, namely rumination in the putative links between depression symptoms and emotional clarity (Research question 2). Based on the reviewed literature, rumination was expected to mediate both the prospective relation of low emotional clarity predicting an increase of depression symptoms (Flynn & Rudolph, 2010, 2014) and, reversely, depression symptoms predicting a decrease of emotional clarity (Rubenstein et al., 2015). We exploratively examined sex as a moderator of the mediation effects (Research question 3); previous studies on this topic could not guide our expectations because they were few and their results equivocal (Flynn & Rudolph, 2014; Rubenstein et al., 2015).

## **Method**

### **Design and Procedure**

The present study selected data from the Social Anxiety and Normal Development (SAND) study (Westenberg et al., 2009). The SAND study had four assessment waves over a period of 5 years (Miers, Blöte, de Rooij, Bokhorst, & Westenberg, 2013). The main analysis used data from W1, W3, and W4 referred to as T1, T2 and T3 in the following text. T1 and T2 were about two years apart and T2 and T3 one to three years. For the additional analyses about the mediating role of rumination in the links between depression symptoms predicting emotional

clarity and reversely emotional clarity predicting depression symptoms, rumination data were available from W2, that took place halfway between T1 and T2, and from T1 (used as control variable). Participants came to the university laboratory to individually complete a battery of assessment forms among them the three questionnaires used in the present study.

## Participants

The SAND study selected youth from two primary schools and one secondary school in an urban area of the Netherlands. Students with severe psychological problems or physical illness were excluded from participation. Information about these conditions was collected from the school and a health questionnaire completed by the students. At T1, 331 youth participated in the SAND study. Eighty-two percent of participants lived with both their biological parents, 5.7% with biological mother only, and 5.1% with biological mother and stepfather. The majority of the participants (91.5%) were born in the Netherlands and 49% of the biological mothers had completed tertiary education (Miers et al., 2013).

The retention rate from T1 to T3 was 71% ( $n = 236$ ). Participants dropped out of the study for various reasons, including moving out of the area, or being too busy with school work or other activities. Apart from attrition there were missing values for six participants. In total, data from 230 participants (119 boys, 111 girls) were available for the main analyses; at T1, 94 of them attended primary school ( $M_{\text{age}} = 10.86$ ;  $SD = 0.90$ ) and 136 secondary school ( $M_{\text{age}} = 14.84$ ;  $SD = 1.29$ ). Because the rumination measure was only completed by secondary school students, fewer cases were available for these analyses. A total of 151 participants (77 boys, 74 girls) had complete data, including rumination data, from T1 through T2. The SAND study was approved by the university's Medical Ethical Committee. Parents gave their written consent and youth their written assent for participation in the study.

## Measures

**Depression symptoms.** The Dutch translation (Timbremont & Braet, 2002) of the Children's Depression Inventory (CDI; Kovacs, 1985) was used to measure depression symptoms. For each of the 27 items of the questionnaire participants are asked which of three statements best describes how they felt in the last two weeks. For example, "*I do most things OK*", "*I do many things wrong*", and "*I do everything wrong*". Scores range from 0 to 2 (most depressed). The

Dutch version has good reliability and validity (Roelofs et al., 2010; Timbremont & Braet, 2002). The item asking about suicide was removed from the questionnaire, because we expected it to be a point of concern for parents and teachers (see e.g., McCabe, Ricciardelli, & Banfield, 2011). The total scores therefore range from 0 to 52. In the present study, Cronbach's  $\alpha$  at T1, T2, and T3 was .80, .84, and .85, respectively.

**Emotional clarity.** We used the "Differentiating emotions" scale of the Emotional Awareness Questionnaire (EAQ; Rieffe et al., 2008) to measure emotional clarity. The EAQ is a questionnaire, specifically developed for use with children and adolescents, that has six scales describing different aspects of emotional awareness. The differentiating emotions scale has 7 items with statements about knowing what one feels and under which circumstances. For example, "*It is difficult to know whether I feel sad, angry, or something else*", "*I never know exactly what kind of feeling I am having*"; "*Sometimes, I feel upset and I have no idea why*". Participants indicate on a three-point scale whether the statement is true for them (1 = *not true*, 2 = *sometimes true*, 3 = *often true*). The EAQ has good psychometric properties (Rieffe et al., 2008). In the present study, Cronbach's  $\alpha$  for the Differentiating Emotions scale was .70, .83, and .81 for T1, T2, and T3, respectively. Because the alpha at T1 was relatively low as compared with the alpha's at T2 and T3, we checked whether the alpha was lower in younger than in older participants. This was not the case. For the primary school participants Cronbach's  $\alpha$  at T1 was .70; for the secondary school participants .69. The scale was reversely coded with a high score indicating high emotional clarity.

**Rumination.** The Responses to Stress Questionnaire (RSQ; Connor-Smith et al., 2000) was used to measure rumination. The RSQ is a scale designed for measuring coping strategies of adolescents in different domains of stress. We used the Dutch translation of the RSQ, and presented the items in relation to a social stress situation (H. Ouwehand, unpublished master thesis). The rumination subscale is part of the involuntary engagement scale and consists of three items ("*When problems with other kids come up, I can't stop thinking about how I am feeling*"; "*When I have problems with other kids I can't stop thinking about what I did or said*"; "*When I have problems with other kids, I can't stop thinking about why they happened to me*"). Items are answered on a scale ranging from 1 to 4 (1 = *not at all*, 4 = *a lot*), according to how often the participant used the presented coping strategy in response to a social stressor. The original

version of the rumination subscale of the RSQ has adequate internal consistency, test-retest reliability, and construct validity (Connor-Smith et al., 2000). Cronbach's  $\alpha$  of the translated version of the rumination subscale was .77. Cronbach's  $\alpha$  in the present study was .77 at W1 (T1) and .75 at W2.

## Data Analysis

To test the different models describing the unidimensional and reciprocal pathways between emotional clarity and depression symptoms (Research question1), we performed an auto-regressive cross-lagged panel analysis (Martens & Haase, 2006) using the Lavaan software in R from <https://cran.r-project.org/web/packages/lavaan/index.html> (Rosseel et al., 2011). We tested four models, (1) a purely auto-regressive model, (2) a model predicting depression symptoms from emotional clarity levels accounting for auto-regressive effects, (3) a model predicting emotional clarity from depression symptoms accounting for auto-regressive effects, and (4) a cross-lagged model combining Models 2 and 3. Criteria used for a well-fitted model were: a non-significant chi-square, a  $\chi^2/df$  ratio around 2, a comparative fit index (CFI) around .95, and a root-mean-square error of approximation (RMSEA) around .08 (Kline, 2005). For answering the second research question we performed two mediation analyses, one with T1 depression symptoms as predictor, T2 emotional clarity as outcome, and W2 rumination as mediator, and the other one with T1 emotional clarity as predictor, T2 depression symptoms as outcome, and W2 rumination as mediator. For answering the third research question, sex was entered as a moderator of both paths of the indirect effect in the mediation analyses (i.e., path a and b). The analyses controlled for T1 rumination and T1 measurements of the outcome variables. The mediation analyses were performed with the PROCESS macro retrieved from <http://www.processmacro.org/> (Hayes, 2013; Hayes & Rockwood, 2016). The macro uses ordinary least squares (OLS) analysis for calculating the mediation and moderated mediation effects, and bootstrapping for calculating the confidence intervals (CI). We used bias-corrected bootstrap CIs based on 1000 bootstrap samples with a 95% level of confidence. For the presence of moderated mediation, the bootstrap CI of the moderated-mediation index was inspected (Hayes, 2015). The analyses were performed with the IBM SPSS 23 package.

## Results

## Preliminary Analyses

We first examined whether the varying time span between T2 and T3 (time span varies between 1 and three years) had an effect on the results. To that purpose, we calculated the correlations between the study variables from the first two time points with those from the third with time span between T2 and T3 in months as control variable. These partial correlations were only slightly different (a few changes in the second decimal) from the zero-order correlations presented in Table 1. We therefore decided that controlling for time span was not needed in subsequent analyses. The zero-order correlations show that depression symptoms and emotional clarity were moderately stable over a period of two years (from T1 to T2) and still significantly correlated over a period of 3 to 5 years (from T1 to T3). Emotional clarity from T1 to T2 was relatively less stable. The (negative) correlations between emotional clarity and depression symptoms were all significant, both within the time-points and across the time points. With regards to age we found that the only variable related with age was emotional clarity at T1. That is to say, that older youth reported higher emotional clarity. At T2 and T3, when participants were two to five years older, this correlation with age was not significant anymore. Depression symptoms were not related to age. With regards to sex, we found a small but significant correlation between sex and emotional clarity at T3. Girls reported less emotional clarity than boys at that time. All correlations of rumination with emotional clarity and depression symptoms were significant (see Table 2). Rumination correlated negatively with emotional clarity and positively with depression symptoms. Rumination was relatively stable with a correlation between the two measurements of .48,  $p < .01$ . Rumination was not significantly related to age and only at W2, it was significantly related to sex. At that time, rumination was higher in girls than boys.

## Models Describing the Link Between Depression Symptoms and Emotional Clarity

The first three models did not fit the data well, with  $\chi^2$  s that were significant,  $\chi^2/df > 3.5$ , CFIs  $< .96$ , and RMSEAs  $> .10$  (see Table 3). The fourth, cross-lagged model had a good fit with  $\chi^2(4) = 7.55$  (n.s.),  $\chi^2/df = 1.89$ , CFI = .99, and RMSEA = .06. As Figure 1 shows, there is a thread starting from depression symptoms at T1 predicting relatively low emotional clarity at T2, and low emotional clarity at T2 predicting relatively high levels of depression symptoms at T3. Furthermore, starting from T2 emotional clarity predicted relatively high levels of depression

symptoms at T3. Notably, emotional clarity at T1 did not predict depression symptoms at T2 and the autoregressive relation of emotional clarity from T1 to T2 was relatively low compared to that of T2 to T3. We checked whether the relatively young age of part of the participants at T1 (the primary school group) could explain this relatively low stability of emotional clarity from T1 to T2 and possibly also influenced the results of the cross-lagged effects. To that purpose, we selected the data from the secondary school students for a follow-up analysis. In the secondary school group, just as in the total group, Model 4 was the only model with a good fit,  $\chi^2(4) = 7.76$ ,  $\chi^2/df = 1.94$ , CFI=.99, RMSEA=.08. The  $\beta$ s of the cross-lagged paths in the model showed a similar pattern as for the total group (see Fig. 1), and the auto-regressive  $\beta$  for emotional clarity level was similar to that in the total group. (We did not separately analyze the data from the primary school group because the  $n$  of this group was too small for finding reliable results of a cross-lagged panel analysis).

### **Rumination as Mediator and Sex as Moderator**

The zero-order correlation between depression symptoms at T1 and emotional clarity at T2 was significant,  $r = -.45$ ,  $p < .01$ ,  $n = 151$ . The mediation analysis on the link between T1 depression symptoms and T2 emotional clarity yielded significant effects. The indirect effect of depression on emotional clarity was significant, effect =  $-.070$  (CI:  $-.239$  to  $-.005$ ; this is significant because the CI does not include zero). The direct effect was also significant, effect =  $-.629$  (CI:  $-.998$  to  $-.259$ ). Thus, rumination partially mediated the link between depression symptoms at T1 and low emotional clarity levels at T2. The moderated mediation analysis that included sex as moderator yielded a non-significant moderated mediation index of  $.127$  (CI:  $-.034$  to  $.402$ ).

The zero-order correlation between emotional clarity at T1 and depression symptoms at T2 was significant,  $r = -.26$ ,  $p < .01$ ,  $n = 151$ . Rumination was not a significant mediator in this link, indirect effect =  $-.005$  (CI:  $-.043$  to  $.024$ ). Inspection of the regression results showed that emotional clarity did not significantly predict rumination (path a), coefficient =  $-.050$  (CI:  $-.301$  to  $.200$ ), but that rumination did predict depression symptoms (path b), coefficient =  $.137$  (CI:  $.076$  to  $.197$ ). The direct effect was not significant, effect =  $-.016$  (CI:  $-.108$  to  $.077$ ). In order to check whether the unexpected lack of evidence for the mediating role of rumination could be ascribed to the rather broad age range of the participants we performed an ad hoc

analysis with age group as moderator of the indirect effect. This analysis showed that results were not different between the age groups. The moderated mediation analysis that included age group as moderator yielded a non-significant moderated mediation index of .008 (CI: -.13 to .11). The mediation analysis with sex as moderator showed that the results were not different between the sexes, index = -.003 (CI: -.065 to .050). In sum, rumination mediated the link between T1 depression symptoms predicting T2 emotional clarity in both sexes, but did not mediate the link between T1 emotional clarity predicting T2 depression symptoms.

### **Discussion**

This study aimed to answer the question how (pre-)adolescents' emotional clarity and depression symptoms are related over time, and if rumination is a mediator in the putative links between depression symptoms and emotional clarity. As expected, emotional clarity and depression symptoms are longitudinally associated variables with a relatively high level of depression symptoms predicting a relatively low level of emotional clarity, and this in turn predicting a relatively high level of depression symptoms. Rumination mediates the path from depression symptoms to low emotional clarity.

The present study is the first one to test a model of reciprocal influence of emotional clarity and depression against models of unidirectional influence of one variable on the other. Emotional clarity and depression symptoms appear to develop in a reciprocal pattern rather than an unidirectional one where one variable always has temporal precedence in the occurrence of the other. This finding suggests that a vicious cycle may occur of high levels of depressive symptoms leading to relatively low levels of emotional clarity which in turn lead to even higher levels of depressive symptoms, and so forth. Rumination seems to play a role in the creation of this cycle. Rumination partly explains why youth with depression symptoms are not developing emotional clarity at the same level as their peers. The mechanism behind this process may be that rumination about negative experiences results in avoidance or suppression of the initial, more threatening emotions (Stroebe et al., 2007). By ruminating about negative emotional events these youth may, perhaps somewhat contra-intuitively, not entirely experience these initial negative emotions (Liverant et al., 2011). The reason why individuals ruminate may be that they feel compelled to reassess the situation that caused their unhappy psychological condition. By re-experiencing the situation again and again, they may try to find out if the situation perhaps is not

as bad as originally experienced and therefore their negative feelings not (totally) warranted. On a more general level, it has been argued that rumination uses psychological resources that are then not available for analyses of the negative mood, its origin and consequences (Rubenstein et al., 2015). For instance, an adolescent girl's boyfriend breaks up with her at a school dance. In the following days she spends so much time ruminating about this experience (e.g., why did he do this, what did he exactly say, what did I do wrong, what could I have done differently?), that there is no room for adequately dealing with her emotions of sadness, loss, and anger. The cognitive processing of the initial emotions is hindered which makes it difficult to learn to identify and understand these emotions. Thus, ruminating about negative experiences may result in less clarity about negative emotions.

Reversely, rumination was not a mediator in the link between emotional clarity and depression symptoms. Although emotional clarity predicted rumination, both concurrently and prospectively (see the bivariate correlations in Table 2), emotional clarity did not predict *changes* in rumination over time. So, the present study did not find evidence suggesting that low emotional awareness may cause increases of ruminative thoughts. Increases were expected because, from a theoretical point of view, low emotional clarity would hinder the development of emotion regulation which is needed for adequate, goal-oriented responses to stress. Instead, inadequate, involuntary responses such as rumination would be expected to occur (Flynn & Rudolph, 2014). Future studies are needed to empirically examine these hypothesized links between emotional clarity, emotion regulation and rumination.

The present findings corroborate the results of previous studies about the prospective prediction of depression symptoms by low emotional clarity levels in youth (e.g., Flynn & Rudolph, 2014; Rieffe & De Rooij, 2012). The finding that rumination was not a mediator in this link seems not be in line with the findings of two of these studies (Flynn & Rudolph, 2010, 2014) that found that involuntary engagement coping (which includes rumination) did mediate the link between emotional clarity and depression symptoms. Involuntary engagement is a relatively broad construct that combines five different involuntary stress responses. Apart from rumination it also includes physiological and emotional arousal, intrusive thoughts, and involuntary action. To what extent specifically rumination contributed to the mediating effect of involuntary engagement in those studies is therefore not clear.

Further, in support of the results of the Rubenstein et al. (2015) study, we found that depression symptoms predicted a decrease of emotional clarity and that rumination partly mediated this link. We found this effect occurring in both sexes while Rubenstein et al. (2015) found that it only occurred in girls. Compared to the Rubenstein et al. (2015) study the present study found only a weak (although statistically significant) relationship between rumination and sex and no significant relationship between depression symptoms and sex. Because part of the reasoning behind the hypothesis of sex as a moderator of the mediation model is that girls ruminate more and are more depressed (Rubenstein et al., 2015), the lack of strong relations between these variables in the present study may explain why sex was not a moderator. Furthermore, it needs mentioning that we measured rumination as a coping strategy referring to a stressful social situation whereas Rubenstein et al. (2015) measured rumination as an emotion regulation strategy. Our results are in line with the Flynn and Rudolph (2014) study that used involuntary engagement coping, which includes rumination, as a mediator. This study did not find that sex moderated the mediating effect of involuntary engagement coping in the link between emotional clarity and depression. Considering the small number of studies in this domain and the equivocal results on the role of sex differences that may be related to different operationalizations of rumination, future studies will be needed to increase our insight into the role sex plays in the link between depression and emotional clarity.

Remarkably, from T1 to T2 depression symptoms were not predicted by emotional clarity, whereas from T2 to T3 they were. We checked whether this discrepancy in results was related to our measure of emotional clarity, the “differentiating emotions scale” of the EAQ (Rieffe et al., 2008) in combination with the relatively young age of part of our participants at T1. Reasons for doing this are that (a) at T1 emotional clarity was related to age with older participants having higher levels of emotional clarity, and (b) the emotional clarity measure was less stable from T1 to T2 ( $r = .36$ ) than from T2 to T3 ( $r = .59$ ). We considered the possibility that at T1 part of the participants in the study, namely the primary school students, were too young to produce reliable results. However, we had to reject this possibility for several reasons. (1) The reliability of the “differentiating emotions scale” was adequate in the younger group and not lower than in the group of secondary school students. (2) The results of the cross-lagged panel analysis did not substantially change when we repeated the analysis only using the data of the older group. The conclusion of the analysis still was that emotional clarity at T1 did not predict depression

symptoms at T2. (3) In the Rieffe and De Rooij (2012) study that also used the “Differentiating emotions scale”, this measure did predict an increase in depression symptoms in 10-year olds. Cumulatively, it is not likely that the measure of emotional clarity in combination with the young age of some of the participants can explain the lack of predictive power of emotional clarity at T1 for depression at T2.

Additionally, with regards to sex differences we found a small but significant correlation between sex and emotional clarity at T3. Girls reported less emotional clarity than boys at that time. This finding is in line with results from previous studies (Extremera et al., 2007; Haas et al., 2018; Rubenstein et al., 2015) and may be explained by the growing complexity of specifically girls’ emotions connected to their social life. This would make it more difficult for them to unravel these emotions (Haas et al., 2018). With regards to age, at T1 but not at later time points emotional clarity level was higher in older youth. It appears that emotional clarity stops increasing in older adolescents. One of the possible reasons for this finding is that not only in girls but in both sexes at a certain age the complexities of their emotions become so large that they undo the influence of increasing (meta)cognitive factors that help to develop emotional clarity (Kranzler et al., 2016). Depression symptoms were not related to age. Older adolescents were not more depressed than younger ones, and depression did not increase over time. This finding is not in line with the results from the Saluja et al. (2004) study. A possible explanation of this difference in results may be that the studies used different measures of depression symptoms. Whereas the present study used the CDI, the Saluja et al. (2004) study designed an instrument closely linked to the criteria as described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-3) (APA, 1987) resulting in a dichotomous indicator of depression. In view of the high prevalence rate of depression reported in that study it is possible that the criterion value for deciding if participants are depressed was relatively low. This relatively low level of depression may increase with age, whereas on the average depression would not increase. Further, it should be noted that although we did not find an age effect in the whole sample, some participants relative to others, became more depressed over time. Our reciprocal model of emotional clarity and depression, and mediation models evaluated these relative changes in depression.

The present findings raise the question how the maladaptive cycle of depression symptoms and emotional clarity can be broken preventing the development of high levels of depression or even clinical depression in youth. Possibly, paying attention to labelling and understanding their initial emotions in acceptance-based treatments can help depressed youth to find ways to get a grip on their negative emotions and to adaptively cope with situations that are stressful to them (Liverant et al., 2011). As Kranzler et al. (2016) argued, understanding and identifying their own feelings should be an important treatment component of interventions for youth with internalizing problems. There may also be a task for parents and teachers in helping children and adolescents to analyze their feelings in emotionally stressful situations. In addition to presenting suggestions how to cope with a particular situation, they could stimulate children and adolescents to first focus on what they are feeling and why they are feeling in this way before they consider strategies that may help them to cope with the situation and make them feel better.

This study has some limitations that need to be mentioned. (1) The design of the study, although longitudinal, does not allow for firm conclusions about causal relationships. Experimental studies are needed to confirm the validity of the present results. (2) Although variables did not correlate with age except for emotional clarity at T1, a study with a smaller age range of participants would be preferable. (3) Because all variables were self-reported measures there is a possible problem with shared-method variance, and (4) the study used a mainly White, middle class sample. It is not clear to what extent the results can be generalized to other populations.

To conclude, the longitudinal relationship between emotional clarity and depression is a reciprocal one suggesting that a maladaptive cycle of depression and low emotional clarity exists. Ruminative thoughts seem to play a role in this cycle possibly by suppressing the initial emotions linked to certain negative situations in depressed youth which impedes the identification of these emotions. The treatment of depression in youth may profit from paying attention to their better understanding of their own emotions, breaking the vicious cycle between depression symptoms and low emotional clarity.

Table 1. Means, Standard Deviations, and Bivariate Correlations between the Main Study Variables ( $n = 230$ )

	Sex	T1 Age	T1 Emotional clarity	T2 Emotional clarity	T3 Emotional clarity	T1 Depression symptoms	T2 Depression symptoms	T3 Depression symptoms
Sex (1=girl)	-	.07	.01	-.10	-.16*	-.06	.07	.05
Age		-	.21**	.06	.06	-.00	.03	-.04
T1 Emotional clarity			-	.36**	.32**	-.40**	-.14*	-.23**
T2 Emotional clarity				-	.59**	-.29**	-.38**	-.41**
T3 Emotional clarity					-	-.26**	-.36**	-.47**
T1 Depression symptoms						-	.42**	.34**
T2 Depression symptoms							-	.57**
T3 Depression symptoms								-
<i>M (SD)</i>	-	13.40(2.24)	16.52(2.59)	16.66(3.08)	17.50(2.94)	9.16(5.35) <sup>a</sup>	9.18(6.06) <sup>a</sup>	8.33(6.08) <sup>a</sup>

<sup>a</sup>Depression symptoms: Extrapolated *M*s (*SD*s) for the 27-item CDI are 9.51 (5.56), 9.53 (6.29), and 8.96 (6.31) for T1 to T3, respectively. \*  $p < .05$ ; \*\*  $p < .01$  one-sided

Table 2. Means, Standard Deviations, and Bivariate Correlations between Rumination and the Other Study Variables ( $n = 151$ )

	W1 (T1) Rumination	W2 Rumination
Sex (1 = girl)	.11	.23**
Age	-.11	.04
T1 Emotional clarity	-.42**	-.28**
T2 Emotional clarity	-.28**	-.32**
T1 Depression symptoms	.48**	.39**
T2 Depression symptoms	.31**	.48**
<i>M</i>	1.92	1.62
<i>SD</i>	0.74	0.57

\*\*  $p < .01$  one-sided

Table 3. Goodness-of-Fit Indices of Nested Models of Depression Symptoms and Emotional Clarity

<b>Model</b>	$\chi^2$	df	<i>p</i>	$\chi^2/df$	CFI	RMSEA
1. Auto-regressive	40.28	8	< .001	5.04	.90	.13
2. Emotional clarity to depression symptoms	22.49	6	< .01	3.75	.95	.11
3. Depression symptoms to emotional clarity	23.29	6	< .01	3.88	.95	.11
4. Cross-lagged	7.55	4	> .05	1.89	.99	.06

### Figure captions

Fig. 1. Model 4, cross-lagged panel analysis of emotional clarity and depression symptoms for the total group and for the older age-group (within brackets). Results are based on standardized variables.

Correlations between emotional clarity and depression symptoms per occasion are not depicted in the figure for clarity reasons.

\*  $p < .05$ , \*\* $p < .01$ .

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