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Cross-lagged links between emotional clarity and emotion regulation strategies during the transition to adolescence – a two-wave study

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Abstract: Transition to adolescence is characterized by changes in emotional functioning. Changes in emotion regulation and the experienced clarity of emotions may be important for children's emotional development. The goal of this study is to explore cross-lagged links between emotional clarity and emotion regulation strategies during a period of one year. More specifically, it was explored whether emotional clarity predicts changes in the usage of two emotion regulation strategies – cognitive reappraisal and expressive suppression, and whether emotion regulation strategies usage predicts changes in emotional clarity. The study was conducted as part of the CHILD-WELL project financed by the Croatian Science Foundation. In this study, 1131 children (mean age at time one is 11.52, SD = 0.88) gave data about their experience of emotional clarity and their usage of cognitive reappraisal and expressive suppression. Two autoregressive cross-lagged models were tested separately for each emotion regulation strategy. Additionally, multigroup analyses were employed to explore the stability of regression paths with respect to different age and gender groups. Results showed that emotional clarity predicted changes in reappraisal and suppression usage. Higher emotional clarity predicted increases in reappraisal and decreases in suppression a year later. For girls only, suppression predicted decreases in emotional clarity.

Keywords: emotional clarity, emotion regulation, cognitive reappraisal, expressive suppression, longitudinal study

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INTRODUCTION

Emotion regulation involves multiple related processes whose aim is to monitor, evaluate and modulate the occurrence, intensity, valence, or duration of emotional reactions to accomplish one's goals (Eisenberg & Morris, 2002; Thompson, 1994). During the transition to adolescence (between the ages of 10 and 12), a significant shift happens in the nature of children's management of their own emotional experiences (Skinner & Zimmer-Gembeck, 2016). Puberty begins during that period, accompanied by cognitive changes which altogether provide both challenges and new capacities for successful emotion regulation. Therefore, in that period children have growing abilities to use demanding cognitive strategies to regulate their emotions such as cognitive reappraisal and expressive suppression – the two most often explored emotion regulation strategies. Cognitive reappraisal is an emotion regulation strategy where the initial appraisal of the situation is changed in order to modulate the emotion trajectory. Expressive suppression refers to the inhibition of all emotion-expressive behavior (Gross, 1998a). Studies show that children use such strategies to regulate their emotions during the transition to adolescence (review on suppression Gross & Cassidy, 2019; review on reappraisal Willner et al., 2022). However, the frequency and efficacy of these strategies are still changing in the context of other developmental changes throughout adolescence. Developmental changes in emotional skills may be especially important for the prediction of changes in emotion regulation. In this study, we focused on emotional skills, more particularly on emotional clarity, the degree to which we can identify and understand our emotions (Gohm & Clore, 2000, 2002), as a predictor of changes in emotion regulation. We also explored possible gender and age differences in the strength of these relations as there are known gender and age differences in emotion regulation and emotional clarity during adolescence (Eastabrook et al., 2014; Gomez-Baya et al., 2017; Gullone et al., 2010).

Emotion regulation and emotional clarity during the transition to adolescence

Usage of cognitive reappraisal and expressive suppression changes during the transition to adolescence although findings regarding the direction of change are inconclusive. A recent review (Willner et al., 2022) of cognitive reappraisal development showed mixed results. Some studies found that reappraisal usage increases across adolescence (age 9 to 15, Valiente et al., 2015), but a few studies with large community samples showed lower reappraisal usage among older children and adolescents in comparison to younger ones (age 12 to 18, Boyes et al., 2016; age 9 to 15, Gullone et al., 2010). In some longitudinal studies, suppression decreased in periods over two years (age range at time 1 was 9-15, Gullone et al., 2010) and over one year period (mean baseline age = 13.8, Larsen et al., 2013), while in others it did not (e.g., Ng et al., 2019, mean age at time 1 was 12.20). Unclear patterns of change during the transition to adolescence are not surprising when we consider variability in pubertal and maturational changes during that period.

Changes in emotion regulation should also be considered with other changes in emotional functioning during adolescence in mind. A review by Bailen and colleagues (2019) showed multiple changes happen across different emotional skills during adolescence. One of the emotional skills that changes during adolescence is emotional clarity, which refers to the degree to which people identify and understand their own emotional experiences (Gohm & Clore, 2000, 2002). Emotional clarity has

been successfully measured with children as young as 8 years old (Flynn & Rudolph, 2010). Although we didn't find longitudinal studies that capture the transition to adolescence, two longitudinal studies showed decreases in emotional clarity between the ages of 12 and 17 (Gomez-Baya et al., 2017; Haas et al., 2019). In both studies, the decrease was more pronounced for girls.

This brief review of studies shows that both experience of emotions and emotion regulation possibly change at the beginning of adolescence. It is possible that these changes contribute to each other. Indeed, models of emotion regulation posit emotional awareness, a broader construct that also includes emotional clarity, as one of the prerequisites for successful emotion regulation. One such model is the extended process model of emotion regulation (Gross, 2015).

The process model of emotion regulation

The process model of emotion regulation (Gross, 1998b) and the upgraded extended process model (Gross, 2015) provide a useful framework for studying emotion regulation strategies and their antecedents. According to the model, emotion regulation strategies can be divided into different categories (for an overview of the process model see Gross, 2014). Two broad categories of strategies are antecedent-focused and response-focused strategies (Gross, 1998a). Antecedent-focused strategies such as cognitive reappraisal are those which are used to change emotional input before the emotion is fully activated, whereas response-focused strategies such as suppression are used after the emotion is fully activated (Gross, 1998a). Studies with these two strategies generally show that reappraisal is an adaptive strategy, while suppression is a maladaptive strategy (Gross, 2014).

The extended process model of emotion regulation details the stages of emotion regulation which lead to active strategy implementation. Emotion regulation unfolds in three stages: identification, selection, and implementation (Gross, 2015; Sheppes, et al., 2015). According to Gross (2015), and Sheppes et al. (2015) the identification stage is crucial for deciding whether to engage in emotion regulation or not. During that stage, the individual perceives their emotional state and evaluates it to decide whether regulation is necessary or not. If regulation is deemed necessary, the person chooses an adequate strategy in the selection stage for regulation based on the repertoire of strategies that they already possess as well as on the characteristics of the context of regulation. In the implementation stage, a person revises and evaluates tactics for the usage of the chosen strategy.

This model also identifies different emotional skills and cognitive abilities which aid the three stages of emotion regulation (Sheppes et al., 2015). One emotional skill that is important for successful emotion regulation is emotional clarity. Being clear about one's emotions may aid emotion regulation in several ways (Gratz & Roemer, 2004; Lischetzke & Eid, 2017; Sheppes et al., 2015). First, a clear understanding of one's emotions is useful in the identification stage of emotion regulation. In that stage, a person should have a clear perception of their own emotions in order to evaluate any discrepancies between the current and desired emotional state. Difficulties in the perception of emotion at that stage may lead to missing opportunities for regulation (Lischetzke & Eid,

2017). More specifically, not being able to identify in what ways the current emotional state differs from the desired state, may halt the emotion regulation process all at once. For instance, having low clarity about one's emo-

tions may lead to using fewer strategies like reappraisal because the need for regulation is not identified.

In other instances, low emotional clarity may not impair the identification of the need to regulate emotions but may impair the selection of adequate emotion strategy. Not being clear about emotions can make the selection process of an adequate strategy more difficult because it may be harder to specifically tailor a strategy to one's own particular needs in a certain context (Lischetzke & Eid, 2017). In that way, lower clarity may be linked to selection of generally maladaptive strategies like suppression.

Links between emotional clarity and emotion regulation strategies

Most of the studies that explored links between emotional clarity and reappraisal and suppression were done on adults. Empirical studies in that area often show support for negative links between high clarity and expressive suppression (Arndt, et al., 2018; Gross & John, 2003; Wang et al., 2019; Zelkowitz & Cole, 2016). Results regarding reappraisal are mixed with some studies showing positive links (Gohm & Clore, 2002; Zelkowitz & Cole, 2016), and others showing no association (Boden et al., 2013; Gross & John, 2003).

Studies with children and adolescents showed that emotional clarity and emotion regulation are associated both concurrently and longitudinally. Flynn and Rudolph (2014) showed that difficulties in emotional clarity predicted less engagement coping (e.g., problem solving) and more involuntary engagement (e.g., rumination) over a period of one year during the transition to adolescence (mean age at the start was 9.95 years). In another longitudinal study (mean age at time one was 13.40 years; Blöte & Westenberg, 2019) higher emotional clarity didn't predict rumination over time, but it was linked to less rumination cross-sectionally. Rubenstein et al. (2015) showed that higher rumination at the prior time point predicted lower emotional clarity in the next time point. This result points to the possible bidirectional links between emotion regulation strategies (i.e., rumination) and emotional clarity. Regarding reappraisal and suppression, in a cross-sectional study by Eastabrook et al. (2014), higher emotional awareness was linked to higher reappraisal and lower suppression among adolescent girls (aged 13-16 years).

Gender and age differences in relations between emotion regulation and emotional clarity

Because of inconclusive results regarding the association between emotion regulation strategies and emotional clarity, it could be useful to explore whether the gender and age of adolescents moderate these links. During adolescence, biological and social changes vary markedly and there is not one universal pattern of changes in emotional experiences (Bailen et al., 2019). Subtle age-related and gender differences may therefore emerge in the strength of the links between different aspects of adolescents' emotional experience. However, there is a lack of studies that explored the moderation effect of gender and age in links between different components of emotional experience. In addition, results of available studies are mixed. In some studies, for girls only, cognitive reappraisal and expressive suppression were linked to depressive symptoms (Ogbaselase et al., 2022) and emotional clarity was linked to aggression and victimization (Rudolph et al., 2020). However, other studies found no gender differences in the strength of the links between emotional clarity and emotion regulation over time (Blöte & Westenberg, 2019; Flynn & Rudolph, 2014).

Age differences are even more rarely explored. But there are known age differences during adolescence in the usage of different emotion regulation strategies (Zimmermann & Iwanski, 2014) and their effectiveness (Theurel & Gentaz, 2018). Because of that, both age and gender differences in links between emotion regulation and emotional clarity were exploratory examined in the present study.

This study

There is a lack of longitudinal studies assessing links between emotional clarity and emotion regulation strategies in the period of transition to adolescence. These studies are especially important to explore potential bidirectional links between emotion regulation and emotional clarity. The extended process model of emotion regulation posits emotional clarity as a predictor of emotion regulation (Gross, 2015; Sheppes et al., 2015). However, reliance on maladaptive emotion regulation strategies, in the long run, may further lead to lower emotional clarity, as suggested by Rubenstein et al. (2015). Therefore, bidirectional links may also be possible. In this study, guided by the extended process model of emotion regulation and by extant developmental studies, we are exploring cross-lagged links between emotional clarity and reappraisal and suppression over a one-year period during the transition to adolescence. We expected that emotional clarity will predict increases in reappraisal usage and decreases in suppression usage over time. Cognitive reappraisal may in turn predict increases in emotional clarity, whereas suppression usage may predict decreases in emotional clarity. Exploratory, we examined whether the same autoregressive cross-lagged model fits in different age groups included in the study (i.e., the three grades), and in the two gender groups. Prior studies were insufficient to form specific hypotheses regarding potential differences between groups.

METHOD

Participants and procedure

This study was conducted as part of the project named Child well-being in the context of family (CHILD-WELL) which is financed by the Croatian Science Foundation. Data used in this study was gathered in the first two waves of the project. In the first time point, 1548 children from 15 different elementary schools in Croatia participated in the project. Children attended the third, fourth, fifth, or sixth grades at the first wave, but in this study only data on children from fourth, fifth and sixth grades (N = 1131; M_{age} = 11.52, SD = 0.88, 51.5% girls) were used because the emotional clarity measure showed adequate functioning in these age subgroups in the Croatian context (Džida, 2022). A year later, in the second wave of the project, 1027 of these children participated (attrition rate 9.2%). Among those who did not participate in the second wave, there were 59 boys and 45 girls, and their average age was 11.53 (SD = .97). Missing data analyses revealed no differences between children who participated in only one-time point and those who participated in both time points (cognitive reappraisal $t(1084) = -1.04$, $p = .150$; expressive suppression $t(1099) = -1.11$, $p = .268$; emotional clarity $t(1096) = -0.50$, $p = .310$; age $t(1125) = -0.17$, $p = .433$). Children reported living with both parents (77%), with their mother only/and their partners (18%), part-time with their mother, and part-time with their father (3%), and others (guardians, father only, 2%).

Both parents and children themselves gave written consent for their participation in this study. Children filled out questionnaires that assessed different constructs (well-being, personality, digital technology usage, emotion regulation, and emotional clarity) during regular school hours.

Instruments

Emotional clarity was measured with a Croatian adaptation of the Emotional Clarity Questionnaire (ECQ; Flynn & Rudolph, 2010). ECQ was based on the Trait Meta-Mood Scale (Salovey et al., 1995) and it was made to be suitable for children and adolescents. Original ECQ consists of 10 items, and in Croatia, the scale was shortened to four items (e.g., *My feelings usually make sense to me*) which showed adequate functioning and measurement invariance for children aged 10-12 years (Džida, 2022). Participants rated each item on a scale form 1 (strongly disagree) to 5 (strongly agree). Cronbach alpha reliability was .70 and .75 for times one and two. Reliabilities for boys and girls across time were .65/.62 and .73/.80. Reliabilities for fourth, fifth and sixth grades across time were .70/.73, .70/.75 and .70/.72.

Emotion regulation strategies were measured with the Emotion Regulation Questionnaire for Children and Adolescents (Gullone & Taffe, 2012) which was adapted from Emotion Regulation Questionnaire (Gross & John, 2003) for use with non-adults. Questionnaire has six items measuring cognitive reappraisal (e.g., *When I want to feel happier about something, I change the way I'm thinking about it*) and four items for expressive suppression usage (e.g., *I control my feelings by not showing them*). Participants rated each item on a scale form 1 (strongly disagree) to 5 (strongly agree). For cognitive reappraisal, Cronbach alpha reliability was .75 and .79 for times one and two. Reliabilities for boys and girls across time were .73/.78 and .76/.80. Reliabilities for fourth, fifth, and sixth grades across time were .73/.79, .75/.78 and .76/.81. For expressive suppression, Cronbach alpha reliability was .68 and .72 for times one and two. Reliabilities for boys and girls across time were .58/.62 and .76/.79. Reliabilities for fourth, fifth, and sixth grades across time were .66/.71, .66/.67, and .72/.75.

Data analysis

Analyses were conducted in R (lavaan package; Rosseel, 2012). Missing data were analyzed before all analyses. Little's MCAR Chi-Square test showed to be insignificant (χ^2 = 88,266, df = 73, p = .108), therefore all available data were used in subsequent analyses. For the main analyses full information maximum likelihood was used, providing 1131 participants in the final analyses.

Before the main analyses, we examined longitudinal factor structures for all variables. For the autoregressive cross-lagged models, equality of factor loadings for the same items across time was recommended (Newsom, 2015). Therefore, we tested the longitudinal model with equal loadings for the whole sample, and for specific groups (age and gender). Models with constrained loadings across time were compared to the models with free loadings across time. All models were tested with a Maximum likelihood robust estimator and Scaled Chi-Squared Difference Test was used to compare nested models. Residuals for the same items were correlated across time. The best-fitting model was chosen based on several fit indices: Comparative Fit Index (CFI > 0.950), the Standardized Root Mean Residual (SRMR < 0.08), and Root Mean Squared Error of Approximation (RMSEA < 0.06) (Hu & Bentler, 1999). Latent correlations between all included variables were reported based on the model with equal loadings across time.

Two autoregressive cross-lagged models were tested to examine whether emotional clarity predicts relative change in two emotion regulation strategies. In both models, factor loadings for each item were constrained to be equal across time.

As part of sensitivity analysis, all models were tested in the three age groups, for boys and girls, and only on participants who had full data at both measurement occasions. For the

multigroup analyses, we have compared the model with free regression paths (two autoregressive paths, and two cross-lagged paths) with the model in which regression paths are constrained to be equal in all groups. If the models did not differ, there was no moderation by the group. In case there was a difference in model fit, we have constrained each regression path in a separate model to identify which constraint worsens the model fit compared to the model with all free paths. All model differences were tested with the Scaled Chi-Squared Difference Test.

RESULTS

Descriptive statistics are shown in Table 1. Skewness for items (not shown in the table) ranged between -1.26 and 1.41, and kurtosis ranged between -1.13 and 1.40.

Table 1 Descriptive statistics for the study variables in the total sample

	N	Min	Max	M	SD	Skewness	Kurtosis
Cognitive reappraisal (T1)	1086	1	5	3.71	0.76	-0.645	0.633
Expressive suppression (T1)	1101	1	5	2.79	0.89	0.175	-0.411
Emotional clarity (T1)	1098	1	5	3.86	0.78	-0.627	0.228
Cognitive reappraisal (T2)	992	1	5	3.52	0.80	-0.459	0.249
Expressive suppression (T2)	1006	1	5	2.85	0.86	0.158	-0.243
Emotional clarity (T2)	1010	1	5	3.77	0.80	-0.643	0.431

Table 2 Model fit indices for measurement equivalence over time in reappraisal and suppression models in the whole sample and in the subsamples divided by age and gender

	Scaled $\chi 2$	df	p	CFI	RMSEA	SRMR	Scaled $\Delta\chi 2$ (p value)
Reappraisal and emotional clarity - baseline	284.869	152	.000	0.970	0.028	0.040	0.636
Reappraisal and emotional clarity - equal loadings	290.609	160	.000	0.971	0.027	0.041	
Suppression and emotional clarity - baseline	188.691	90	.000	0.971	0.031	0.046	0.344
Suppression and emotional clarity - equal loadings	195.870	96	.000	0.971	0.030	0.047	
Multi-group analysis - Gender							
Reappraisal and emotional clarity - baseline	464.702	304	.000	0.964	0.031	0.047	0.390
Reappraisal and emotional clarity - equal loadings	488.928	328	.000	0.964	0.029	0.051	
Suppression and emotional clarity - baseline	316.302	180	.000	0.961	0.037	0.054	0.204
Suppression and emotional clarity - equal loadings	338.597	198	.000	0.960	0.035	0.057	

Multi-group analysis - Age groups							
Reappraisal and emotional clarity - baseline	603.152	456	.000	0.968	0.029	0.050	0.974
Reappraisal and emotional clarity - equal loadings	624.629	496	.000	0.972	0.026	0.053	
Suppression and emotional clarity - baseline	363.643	270	.000	0.973	0.030	0.053	0.819
Suppression and emotional clarity - equal loadings	386.389	300	.000	0.975	0.028	0.056	

Table 3 Latent intercorrelations among all variables, *N* = 1131.

	1	2	3	4	5	6	7	8
1. Cognitive reappraisal (T1)	-							
2. Expressive suppression (T1)	0.11*	-						
3. Emotional clarity (T1)	0.44**	-0.25**	-					
4. Cognitive reappraisal (T2)	0.50**	0.02	0.32**	-				
5. Expressive suppression (T2)	-0.06	0.58**	-0.26**	0.04	-			
6. Emotional clarity (T2)	0.26**	-0.22**	0.55**	0.35**	-0.36**	-		
7. Age	-0.07*	0.09*	-0.04	-0.05	0.12**	-0.07*	-	
8. Gender	-0.08*	-0.09*	-0.16**	-0.11**	-0.04	-0.22**	-	-

Note: *p<.05, **p<.01; gender 1-boys, 2-girls.

Longitudinal invariance of factor loadings was supported for all constructs and across three age and two gender groups (Table 2), therefore in all analyses factor loadings were constrained for the same items across time.

Intercorrelations among the main constructs are shown in Table 3. Emotional clarity correlated with two emotion regulation strategies at both waves. Higher emotional clarity was linked with higher reappraisal, and lower suppression. Some age and gender differences were also present, although the effects were rather small. At both waves, girls used less reappraisal, and had lower clarity, and older children used more suppression.

Stability coefficients ranged between .50 (reappraisal) and .58 (emotional clarity). Emotional clarity and two regulation strategies were also correlated across waves.

Autoregressive cross-lagged models had a good fit both for cognitive reappraisal ($\chi2(160) = 290.609$, $p < .01$, CFI = 0.971, RMSEA = 0.027, SRMR = 0.041) and for expressive suppression ($\chi2(96) = 195.870$, $p < .01$, CFI = 0.971, RMSEA = 0.030, SRMR = 0.047). In the reappraisal model, emotional clarity at time one predicted changes in reappraisal at time two ($\beta = 0.13$, $p = .013$), but reappraisal from time one didn't predict changes in clarity ($\beta = .025$, $p = .631$). In the suppression model, emotional clarity at time one predicted changes in suppression usage ($\beta = -0.123$, $p = .003$), while suppression at time one didn't predict changes in emotional clarity ($\beta = -0.082$, $p = .072$). These two models were tested with

Table 4 Fit indices for tested autoregressive cross-lagged panel models

	Scaled $\chi2$	df	p	CFI	RMSEA	SRMR	Scaled $\Delta\chi2$ (p value)
Reappraisal and emotional clarity	290.609	160	.000	0.971	0.027	0.041	-
Suppression and emotional clarity	195.870	96	.000	0.971	0.030	0.047	
Multigroup – age groups							
Reappraisal and emotional clarity – free regression paths	624.629	496	.000	0.972	0.026	0.053	0.797
Reappraisal and emotional clarity – constrained regression paths	627.776	504	.000	0.973	0.026	0.054	
Suppression and emotional clarity – free regression paths	386.389	300	.000	0.975	0.028	0.056	0.075
Suppression and emotional clarity – constrained regression paths	400.846	308	.000	0.973	0.028	0.059	
Multigroup – gender groups							
Reappraisal and emotional clarity – free regression paths	488.928	328	.000	0.964	0.029	0.051	0.286
Reappraisal and emotional clarity – constrained regression paths	493.760	332	.000	0.963	0.029	0.053	
Suppression and emotional clarity – free regression paths	338.597	198	.000	0.960	0.035	0.057	0.019
Suppression and emotional clarity – constrained regression paths	350.568	202	.000	0.957	0.036	0.063	
Suppression and emotional clarity – gender-specific path for suppression	344.979	201	.000	0.959	0.036	0.060	.10*

Note: *compared to the Suppression and emotional clarity model with free regression paths

respect to age and gender groups to examine whether autoregressive and cross-lagged paths differ between the groups.

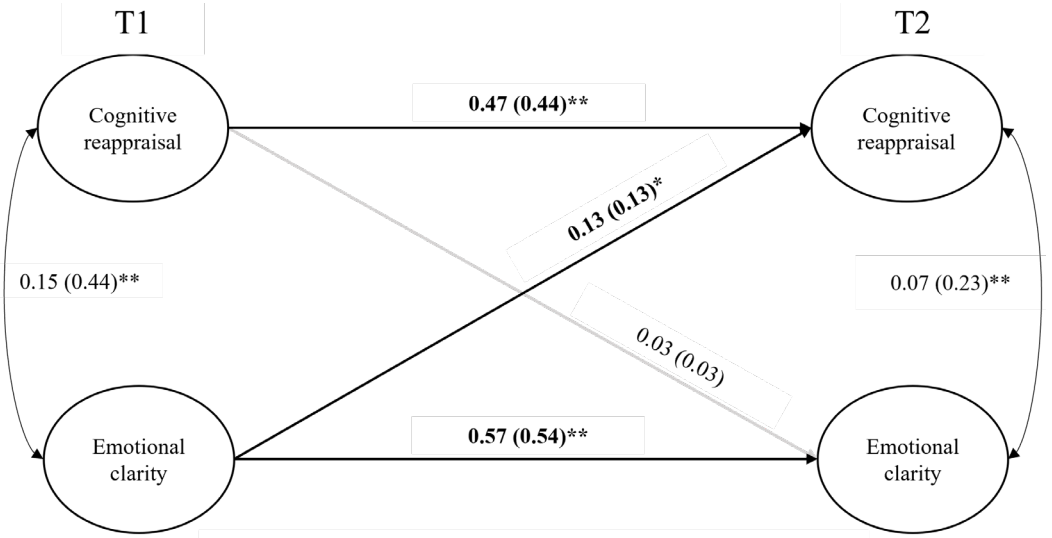
Multigroup analysis

For the three age groups, a model with autoregressive and cross-lagged paths constrained to be equal in all three groups didn't differ from the free model for either reappraisal ($\Delta\chi2 = 4.62$, df = 8, $p = 0.797$) or suppression ($\Delta\chi2 = 14.291$, df = 8, $p = 0.075$).

For gender, the reappraisal model with constrained regression paths didn't differ from the free model ($\Delta\chi2 = 5.01$, df = 4, $p = 0.286$). The model for reappraisal based on the whole sample is shown in Figure 1.

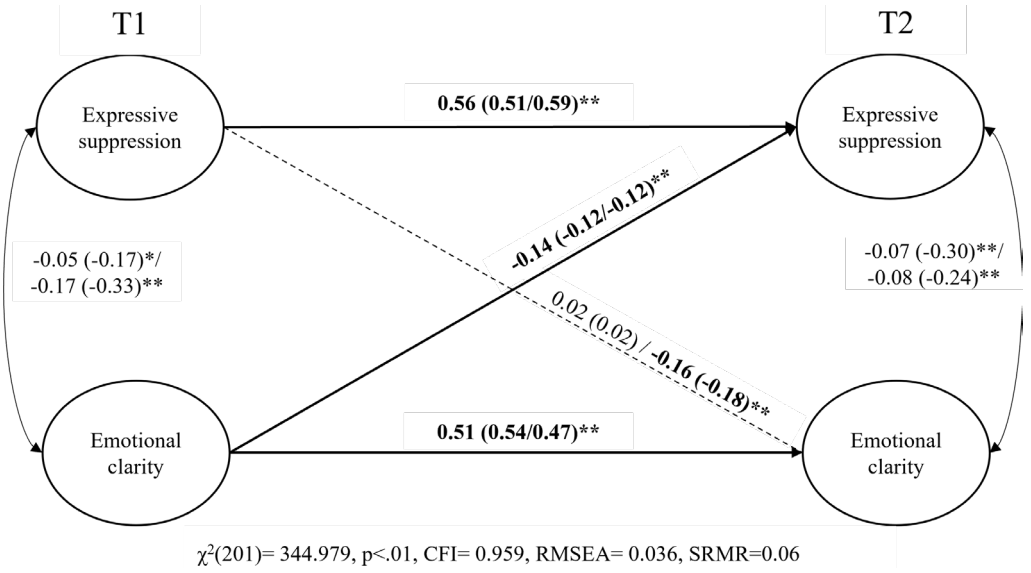
With respect to gender, baseline and constrained suppression models differed significantly ($\Delta\chi2 = 11.75$, df = 4, $p = 0.019$). Therefore, every regression path was tested separately and compared to the baseline model (with free regression paths) for gender. The model with all constrained paths and one free regression path from suppression at time one to emotional clarity at time two did not differ from the baseline model (baseline model compared to the model with free path - $\Delta\chi2 = 6.32$, df = 3, $p = 0.10$). It was determined that the suppression effect on change in emotional clarity differs significantly between genders.

As reported previously, emotional clarity modestly predicted increases in cognitive



Note: unstandardized coefficients are outside parentheses; the standardized solution is in the parentheses; *p<0.05; ** p<0.01.

Figure 1 Structural model for links between cognitive reappraisal and emotional clarity based on the whole sample



Note: unstandardized coefficients are outside the parentheses; the standardized solution is in parentheses; the unstandardized solution is constrained for all regression paths except for the path marked with a dashed line; parameter estimates for girls are presented after the slash sign; within time correlations are free in both groups as in the example in Little (2013); *p < 0.05; ** p < 0.01.

Figure 2 Structural model for links between expressive suppression and emotional clarity based on the whole sample with gender-specific regression path

reappraisal usage over a period of one year, while reappraisal did not predict relativ change in emotional clarity (Figure 1). Overall, R^2 for reappraisal was .26.

In the second model, with a gender-specific path, higher emotional clarity in the first wave predicted decreases in suppression in the second wave for both boys and girls. Furthermore, expressive suppression usage at the first wave predicted decreases in emotional clarity a year later only for girls. R^2 for expressive suppression was .31 for boys, and .41 for girls. R^2 for emotional clarity was .29 for boys, and .31 for girls. In both models, all cross-lagged effects were rather small.

Additional analyses conducted on data available at both time points showed the same results as the ones which are presented above.

DISCUSSION

Transition to adolescence is a developmental period marked by changes in different aspects of emotional functioning. The goal of this study was to assess cross-lagged links between emotional clarity and two emotion regulation strategies during the transition to adolescence. We also explored whether gender or age groups moderated these links.

Emotional clarity at time one predicted relative change in cognitive reappraisal and expressive suppression usage over a period of one year. Children who reported higher emotional clarity at time one showed decreases in expressive suppression and increases in cognitive reappraisal usage over time. These results are in line with the propositions of the extended process model of emotion regulation according to which emotional skills such as emotional awareness and clarity are needed for successful emotion regulation (Sheppes et al., 2015). These emotional skills may aid different stages of emotion regulation. Understanding one's own emotions may support identification processes and ease the selection of appropriate strategies such as cognitive reappraisal. On the other hand, difficulties in emotional clarity are linked with increases in expressive suppression which shows that emotional confusion may be linked to more maladaptive strategies usage. These results are also in line with a developmental theory that posits the development of emotional awareness as a necessity for successful coping and emotion regulation (Saarni, 1999). In addition, this study demonstrates covariation between these constructs during their development.

Exploratory, gender differences were found with respect to links between expressive suppression at time one and changes in emotional clarity from time one to time two. Only for girls, expressive suppression usage predicted decreases in emotional clarity. These results point to reciprocal links between suppression and emotional clarity in this age period for girls. Prior studies also reported gender differences in the development of emotional clarity (Gomez-Baya et al., 2017; Haas et al., 2019) and in the levels of emotional clarity (Extremera et al., 2007; Freed et al., 2016). Girls often experienced lower levels of emotional clarity and greater decreases during adolescence. This study shows that, for girls, the usage of maladaptive strategies may be one of the explanations for their decreases in emotional clarity.

In the subsample of boys, suppression did not predict emotional clarity longitudinally. Even though clarity predicted the usage of maladaptive strategies for boys, the usage of maladaptive strategies may not be linked with worse outcomes for boys in all instances. For example, it has been shown for boys that suppression usage has been moderated by reappraisal usage (Yeh et al., 2017) in a way that reappraisal mitigates positive links between

suppression and internalizing problems. Another reason why suppression did not predict changes in emotional clarity for boys may be the somewhat lower reliability of suppression among boys (Cronbach alpha for boys was .58 and for girls .76). The low reliability of suppression in some subsamples has been reported before in other studies as well (Teixeira et al., 2015).

Overall, the results of this study point to the intertwined development of emotional clarity and emotion regulation during the transition to adolescence. Even though cross-lagged effects are on the lower side, intercorrelations at each time point show a stable pattern of links between the studied constructs in this developmental period. These results are showing the direct connection between two possible transdiagnostic phenomena which are often associated with different psychopathological symptoms among adolescents. In a meta-analytic review (Sendzik et al., 2017), low emotional awareness was related to higher depressive and anxiety symptoms among children and adolescents. Similarly, emotion regulation strategies are also linked with different child and adolescent psychopathology such as internalizing and externalizing symptoms (Cavicchioli et al., 2023; Compas et al., 2017). The variance which is shared between different emotional skills and emotion regulation may be especially important for the development of psychopathology.

This study has some limitations. Firstly, links between emotional clarity and emotion regulation should be examined with other types of emotion regulation strategies in addition to those studied in this research (such as avoidance or distraction) and with longer measures of emotional clarity to explore the generalizability of these results. In this study, all constructs were measured at the level of a trait over a relatively long period of time. In reality, emotional clarity and emotion regulation vary on a daily basis. Therefore, experience sampling studies are necessary to explore their interrelatedness in more detail. Similarly, for a more reliable estimation of links between their development, studies with more repeated measures are needed. Lastly, this study was based on a convenient community sample.

CONCLUSION

Overall, emotional clarity consistently predicted increases in reappraisal and decreases in suppression usage over a period of one year. For girls only, suppression contributed to decreases in emotional clarity a year later. This study demonstrates longitudinal links among different aspects of emotional functioning during the transition to adolescence.

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Križne veze između emocionalne jasnoće i strategija regulacije emocija prilikom tranzicije u adolescenciju – longitudinalna studija

Sažetak: Tranziciju u adolescenciju karakteriziraju brojne promjene u emocionalnom funkcioniranju. Promjene u regulaciji emocija i doživljenoj jasnoći emocija mogu biti važne za emocionalni razvoj djece. Cilj je ovog istraživanja ispitati križne veze između emocionalne jasnoće i strategija regulacije emocija tijekom razdoblja od jedne godine. Istraženo je predviđa li emocionalna jasnoća promjene u korištenju dviju strategija regulacije emocija – kognitivne ponovne procjene i ekspresivne supresije, te predviđa li uporaba strategija

regulacije emocija promjene u emocionalnoj jasnoći. Studija je provedena u sklopu projekta CHILD-WELL, koji je financirala Hrvatska zaklada za znanost. U ovom istraživanju, 1131 dijete (prosječna dob u prvoj točki mjerenja je 11,52, SD = 0,88) dalo je podatke o svom doživljaju emocionalne jasnoće i upotrebi kognitivne ponovne procjene i ekspresivne supresije. Za svaku strategiju regulacije emocija zasebno su testirana dva autoregresijska križna modela. Dodatno, korištene su višegrupne analize kako bi se istražila stabilnost regresijskih koeficijenata s obzirom na različite dobne i spolne skupine. Rezultati su pokazali da emocionalna jasnoća predviđa promjene u kognitivnoj ponovnoj procjeni i supresiji. Veća emocionalna jasnoća predviđa povećanje kognitivne ponovne procjene i smanjenje supresije godinu dana kasnije. Samo za djevojčice, supresija je predviđala smanjenje emocionalne jasnoće.

Ključne riječi: emocionalna jasnoća, regulacija emocija, kognitivna ponovna procjena, ekspresivna supresija, longitudinalna studija

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