



The Effectiveness of Interpersonal Emotion Regulation and the Role of Anxiety in Parent-adolescent Relationships

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Abstract

Background The ability of adolescents to regulate their emotions and take advantage of their parents' guidance may affect how they experience their transition to adulthood and their tendency to develop current and future mental health problems. The present study had two aims; first, to test the effectiveness of interpersonal emotion-regulation (ER) compared to self-ER. Second, to examine how interaction between parent/adolescent anxiety influences the effectiveness of interpersonal compared to self-ER.

Methods 39 couples of parents (13 males; 26 females, 39–61 years of age) and adolescents (17 males; 22 females, 13–18 years of age) participated in the study. Adolescents viewed negative emotional images with low or high intensity. For each image, they were instructed to either choose and apply a regulatory strategy (i.e., self ER) or to apply a regulatory strategy chosen by their parents (i.e., interpersonal ER).

Results It was found that in low anxiety parents- low anxiety adolescents, the effectiveness of self and interpersonal ER were equal. In low-anxiety parents- high-anxiety adolescents, on the other hand, there was a significant advantage to interpersonal compared to self-ER. In high-anxiety parents, there was a significant advantage to self, compared to interpersonal ER in reducing distress, independent of the level of anxiety experienced by the adolescent.

Conclusions The study has significant clinical implications, providing a behavioral tool to decrease distress in highly anxious individuals during the challenging times of pre-adulthood.

Keywords Self emotion regulation · Interpersonal emotion regulation · Anxiety · Adolescents · Parental support · Distress

Introduction

The ability to regulate emotions develops gradually. During childhood, it relies on the actions and interventions of the caregivers (Eisenberg et al., 2010), whereas more independent emotion regulation (ER) skills develop substantially during adolescence (Riediger & Klipker, 2014; Miller-Slough & Dunsmore, 2016). Studies have shown that an

appropriate selection of ER strategies decreases levels of distress in aversive situations (Gross, 2014; Shafir, Guarino, et al., 2017). However, adolescents have limited life experience (Eisenberg & Spinrad, 2004; Niven, 2022) and hence may find it more difficult to choose the adequate strategy for each situation. This may result in poor self-ER (Zimmermann & Iwanski, 2014), which may impair general well-being (Eisenberg et al., 2010; Schwartz-Mette et al., 2021).

Moreover, poor self ER is associated with various clinical disorders in adolescents, including social anxiety (Daniel et al., 2019) and generalized anxiety (Suveg & Zeman, 2004; Young et al., 2019), as well as a heightened risk for developing various anxiety disorders during adulthood (Young et al., 2019). This may suggest a significant added value to conditions of interpersonal ER. In such conditions, the regulation process is done in a social context, allowing individuals to receive help from others in managing their emotions. Yet, studies in this field are sparse (Bariola et al., 2011; Nozaki

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& Mikolajczak, 2020). The current study focuses on one aspect of interpersonal ER in which the emotions of the adolescent are regulated by one of the parents (Messina et al., 2021). The aim of the current study is twofold; first, to test the added value of parent-adolescent interpersonal ER relative to self-ER. Second, to test how levels of anxiety experienced by both the adolescents and their parents influence the effectiveness of interpersonal compared to self-ER.

The effectiveness of interpersonal compared to self-ER, especially in adolescence, is still unclear. While extensive research examines self-ER in adolescence (for review, see Riediger & Klipker, 2014), studies on interpersonal ER at this age are sparse (Gökdağ, 2021), despite its significant implications on well-being (Williams et al., 2018). Importantly, most previous studies on interpersonal ER did not directly compare the effectiveness of self vs. interpersonal ER. In one study that drew such a comparison involving romantic partners, it was found that interpersonal ER was more beneficial than self-ER in reducing distress (Levy-Gigi & Shamay-Tsoory, 2017).

In the present study, we assessed the ability to reduce distress by using the most appropriate cognitive regulatory strategy. This was done by applying a well-validated performance-based paradigm (Levy-Gigi & Shamay-Tsoory, 2017; Shamay-Tsoory & Levy-Gigi, 2021) modified to test parent-adolescent dyads. The paradigm allows to compare levels of distress when adolescents choose a regulatory strategy themselves and when the parent chooses a strategy. Similar to other studies in the field (e.g., Aldao & Nolen-Hoeksema 2010; Sheppes et al., 2014), we focused on two ER strategies, namely reappraisal and distraction (Aldao, 2013; Bonanno & Burton, 2013; Sheppes et al., 2014). Reappraisal in this paradigm requires individuals to alter the way they perceive the situation, for example, when watching two people holding hands and crying; instead of focusing on the distress, these people may feel, this would be to focus on the social support they provide for each other. Distraction, on the other hand, requires a focus of attention on neutral thoughts unrelated to the viewed image, for example, watching those same people holding hands and crying and thinking about neutral yellow triangles (Gross, 2014).

Indeed, studies of self-ER have shown that appropriate selection between reappraisal and distraction strategies decreases levels of distress in aversive situations (for reviews, see Gross 2014; Shafir et al., 2017; Sheppes et al., 2015). However, the effectiveness of different regulatory strategies is not absolute and depends on various contextual conditions, including the intensity of the aversive event (Olatunji et al., 2017; Sheppes et al., 2014), the controllability of the stressor (Troy et al., 2013) and the personality traits of the target (Vered et al., 2021; Xia et al., 2014). In line with previous results (Levy-Gigi & Shamay-Tsoory,

2017), we predict that for adolescents, interpersonal ER will be more beneficial than self-ER in reducing their distress.

Although adolescents are in the process of moving towards independence (De Goede et al., 2009), they may still look for parental support when facing extreme or unusual emotional situations. Hence, we predicted an increased effectiveness of interpersonal compared to self ER in this group. The effectiveness of interpersonal emotion regulation may be especially high in adolescents who exhibit heightened levels of anxiety due to the rapid neurological, physical and emotional changes which characterize this developmental period (Costa & Weems, 2005; Patton et al., 2016). However, not every parent can provide the required support. Whereas parents with adaptive modeling of emotions improve the emotional development of their children and reduce their risk to develop anxiety disorders (Remmes & Ehrenreich-May, 2014), parents with maladaptive modeling may negatively affect it. For example, it was found that parents who are self-centered and frightened fail to select and suggest adaptive ER strategies (Rasing et al., 2019) or to provide an outside perspective (Costa & Weems, 2005; Sheppes et al., 2014), which are crucial for successful interpersonal ER. Hence, we expected to find a significant interaction between the efficacy of interpersonal versus self ER and the anxiety of the parent and/or the adolescents. Specifically, we hypothesized that when adolescents are highly anxious, the effectiveness of interpersonal ER will be significantly higher compared to self-ER. However, when the regulating parent is highly anxious, self-ER may be more effective than interpersonal ER.

Methods and Materials

Participants

The sample size was calculated using G*Power software (Faul et al., 2007). Based on the effect size found in a previous related study (Levy-Gigi & Shamay-Tsoory, 2017), we conducted an a-priori power analysis for repeated measures ANOVA. This revealed a need for 38 adolescent-parent couples based on the ability to detect a medium-size effect (Cohen's $f=0.25$) in the study, with a 5% significance level (α) and 80% power level ($1-\beta$) (Cohen, 1992). Based on these results, we recruited 44 adolescent-parent couples who volunteered to participate in the study (see Table 1 for a detailed description of the sample). The adolescents' ages varied between 13 and 18. The parent group comprised 13 fathers and 26 mothers. All the participating parents reported being primary caregivers, and there were no significant differences between them in sociodemographic variables. Exclusion criteria for all participants were: a current or past

Table 1 A detailed description of the sample: Range, Mean, and (SD)

	Parents	Adolescents
Age	39–61	13–18
Gender	Male	13
	Female	26
Marital Status	Married	32
	Divorced	7
Education (Years)	16.87 (2.47)	
Anxiety	70.46 (21.4)	70.15 (20.45)
QRI Support		23.39 (3.39)
QRI Conflict		18.55 (4.3)
QRI Depth		20.75 (2.1)

QRI- Quality of the Relationship Inventory, Anxiety as measured by the State-Trait Anxiety Inventory (STAI)

diagnosis of psychotic disorders; risk of suicidal/homicidal ideation; any substance dependence or abuse within the past six months; a history of concussion or other clinically significant head injuries including loss of consciousness for over 10 min; or a history of neurological disorders such as epilepsy, multiple sclerosis, stroke, encephalitis, or being on medication for neurological disorders, such as an attention deficit hyperactivity disorder. Five adolescents reported taking Ritalin (methylphenidate) and were therefore excluded from the sample. The final sample comprised 39 couples. The study was approved by the Bar-Ilan university ethics board (Approval #66). All participants provided written informed consent prior to beginning the experiment.

Measures and Procedure

The Self-interpersonal Emotion Regulation Paradigm

We used a modified version of the self-interpersonal ER paradigm (Levy-Gigi & Shamay-Tsoory, 2017). In this task, participants view 30 aversive pictures from the International Affective Picture System (IAPS; Lang et al., 2008), with either low (Mean arousal = 5.0; Mean valence = 3.4, Ranges 4.0–5.9 and 3.0–3.7 respectively) or high (Mean arousal = 6.1; Mean valence = 2.0, Ranges 5.2–7.3 and 1.4–2.6 respectively) negative intensity. The content of the pictures from the original task was adjusted to fit adolescents. An experimental trial involved observing a brief (500 ms) preview of each picture followed by an instruction screen (which differs depending on the experimental condition described below). Afterward, the emotional picture reappeared for an extended duration (5000 ms), and the participants were instructed to apply one of two cognitive ER strategies- distraction or reappraisal. Adolescents chose the strategy in the self-ER condition, whereas in the interpersonal conditions, their parent chose the strategy for them. In the control trials, adolescents were instructed to merely

watch the pictures without any effort of interpretation and to choose between different frame colors (green or blue). At the end of each trial, the adolescents were asked to rate their level of distress on a 9-point Likert scale, with higher numbers indicating greater distress.

The experiment started with a training session in which the adolescents and their parents learned how to apply different ER strategies. In the beginning, the experimenter provided an example for each strategy; later, the participants practiced it independently while describing how they applied it. The experimental sessions started only after the experimenter ensured that the application of the different strategies was fully understood.

In each dyad, the parent was the regulator, and the adolescent was the target. These roles were consistent throughout the entire experiment. The adolescent and the parent were in the room during all testing sessions. They sat next to each other at a fixed distance that did not allow eye contact or touch and were asked to avoid any communication throughout the experiment. Each one had a computer screen in front of them. Stimuli were presented on the two computer screens simultaneously. During the interpersonal ER conditions, the parent's selected strategy appeared on the screen of the target, and the target had to implement it to reduce distress.

Self-report Questionnaires

The State-Trait Anxiety Inventory (STAI-Y; Spielberger et al., 1983) was used to test the severity of anxiety of both parents and adolescents. Since we were interested in comparing participants with high vs. low anxiety levels, we divided our sample using the median as a cutoff point. This is a common method that was used in many other studies which divided their samples into high and low-anxiety groups (Goldfield & Legg, 2006; Knight et al., 2019; Patel et al., 2017; Reinholdt-Dunne et al., 2012).

The Quality of Relationships Inventory (QRI; Pierce et al., 1991) was used to ensure that our participants did not suffer any major family-relationship conflict or crisis at the time of testing. All participants reported average-to-high levels of relationships in all QRI scales. See Table 1 for a detailed description. On the conflict scale, scores ranged from 12 to 28; on the depth scale, scores ranged from 14 to 24 and on the support scale, scores ranged from 16 to 27. Therefore, no one was excluded from the study based on the scores in this questionnaire.

Results

Correlations Between Anxiety, Emotion Regulation, and the Quality of the Relationship

We conducted Pearson correlations to test the associations between anxiety, emotion regulation, and parent-adolescent relationship quality. The results revealed a significant positive correlation between the adolescents' anxiety and their level of distress following self-emotion regulation $r(39)=0.43$, $p<.01$, indicating that greater anxiety reduces the adolescents' effectiveness in self-regulating their emotions. In addition, we found a negative correlation between the adolescent's anxiety and her/his perceived parental support $r(39)=-0.38$, $p<.05$, and a positive correlation between the adolescent's anxiety and her/his perceived parental conflicts $r(39)=0.36$, $p<.05$, indicating that greater adolescents' anxiety is associated with lower parental support and higher levels of parental conflicts. There were no significant correlations between the adolescents' anxiety and the effectiveness of interpersonal emotion regulation, nor between the parents' anxiety and the effectiveness of the adolescents' self and interpersonal emotion regulation. Finally, no significant associations existed between the parents' anxiety and their various perceived relationship qualities. The results suggest links between anxiety, emotion regulation, and relationship quality. The following analyses shed light on the complex connection between these variables.

The Effectiveness of Interpersonal vs. Self ER

To examine the effectiveness of ER in reducing distress, we conducted a Regulatory Strategy (regulation vs. no regulation control condition) X Intensity Level (low vs. high) X Regulatory Type (self vs. interpersonal) analysis of variance (ANOVA) with repeated measures. We found a significant main effects of Regulatory Strategy, $F(1, 38)=118.29$, $p<.001$, $\eta^2p=0.76$, and Intensity Level, $F(1, 38)=133.35$, $p<.001$, $\eta^2p=0.78$, indicating that when the participants applied a regulatory strategy, their level of distress was significantly lower compared to the no strategy control condition, and that level of distress was higher in high compared to low-intensity trials. As opposed to our prediction, we found no main effect of Regulation Type, $F(1, 38)=1.19$, $p=.28$, suggesting no significant differences between self and interpersonal emotion regulation. In addition, there were no significant interactions of Regulation Type with Regulatory Strategy and Intensity Level (all $F_s < 1$). The results indicate that while the manipulation works (applying regulatory flexibility helps and high-intensity conditions evoke more distress), the level of intensity does not affect

the success of self-vs. interpersonal emotion regulations. Hence, the effectiveness of both methods did not change between low and high-intensity conditions. Therefore, in the following analysis, we merged these conditions.

The Role of Anxiety in Self and Interpersonal Emotion Regulation

To examine the role of adolescents' and parents' anxiety in the effectiveness of self vs. interpersonal ER, we conducted a repeated measures ANOVA of Adolescent Anxiety (low vs. high) by Parent Anxiety (low vs. high) by Regulation Type (self vs. interpersonal). There was no significant main effect of Regulation Type $F(1, 35)=1.37$, $p=.25$ nor the interaction between Adolescents Anxiety and Regulation Type $F(1, 35)=1.86$, $p=.18$. However, there was a marginal interaction between Parents Anxiety and Regulation Type $F(1, 35)=4.23$, $p=.047$, $\eta^2p=0.11$ and, most importantly, a significant triple interaction of Adolescent Anxiety by Parent Anxiety by Regulation Type $F(1, 35)=7.1$, $p=.012$, $\eta^2p=0.17$. To understand the nature of this triple interaction, we conducted separate follow-up analyses for parents with low and with high anxiety. The results revealed that for a parent with low anxiety, there was no main effect of Regulatory Type $F(1, 18)=0.33$, $p=.58$. However, there was a significant interaction of Regulatory Type and Adolescents Anxiety $F(1, 18)=6.73$, $p=.018$, $\eta^2p=0.27$. Follow-up comparison with Bonferroni correction ($\alpha=0.01$) revealed that for adolescents with low anxiety, there were no significant differences between self and interpersonal ER $F(1, 10)=1.83$, $p=.21$, whereas for adolescents with high anxiety interpersonal ER was better from self ER $F(1, 8)=6.54$, $p=.03$, $\eta^2p=0.45$. For parents with high anxiety, there was a significant main effect of Regulatory Type $F(1, 17)=6.80$, $p=.018$, $\eta^2p=0.27$, but no significant interaction of Regulatory Type and Adolescent Anxiety $F(1, 17)=1.11$, $p=.31$, indicating that when the parents exhibit high anxiety, self-ER is significantly better in reducing distress compared to interpersonal ER, independent of the level of anxiety experienced by the adolescent (Fig. 1). To test whether the quality of the parent-adolescent relationship affects these results, we repeated the analysis while controlling for the perceived parental support and parental conflict. Importantly, not only the pattern of results remained, the significant level increased. The new triple interaction of Adolescent Anxiety by Parent Anxiety by Regulation Type is $F(1, 33)=8.51$, $p=.006$, $\eta^2p=0.21$.

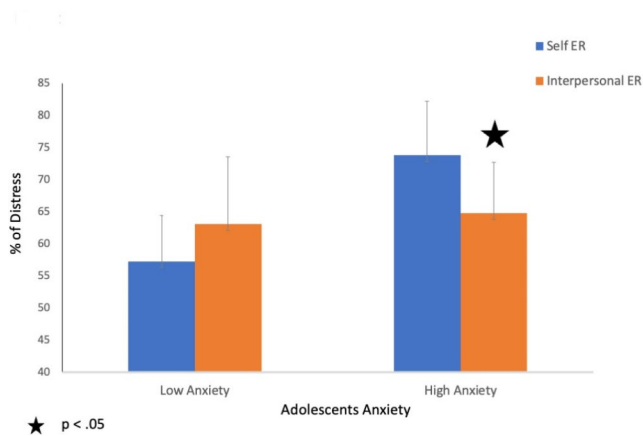


Fig. 1 Level of distress as a function of adolescents' anxiety (low vs. high) and regulation type (self/interpersonal ER)

Discussion

The aim of the current study was twofold; to examine the effectiveness of interpersonal compared to self-ER in adolescence and to test whether the anxiety experienced by the regulating parents and their adolescent children affects it. The results revealed no significant difference between self and interpersonal ER, indicating that adolescents equally benefit from self and interpersonal ER. Hence, although they may have little experience, and their ER abilities are not fully developed, they tend not to rely on their parents when regulating emotions. On the other hand, despite the possible tension between them and their parents in this developmental period, interpersonal ER attempts do not result in increased distress.

This null effect may also indicate individual differences in the ability to apply self-ER and to take advantage of interpersonal ER, as indeed was the case when we examined the role of anxiety. Specifically, we found that when the regulating parents exhibit a high level of anxiety, self-ER better reduces distress compared to interpersonal ER. These results may suggest that parents suffering from a high level of anxiety may have difficulties in offering appropriate regulation strategies. The results are in line with previous studies, which showed that maladaptive ER among anxious parents is associated with both feelings of poor emotional understanding among their children (Flick et al., 2019; Remmes & Ehrenreich-May, 2014) and poorer socioemotional skills (Fabes et al., 2001; Miller-Slough & Dunsmore, 2016). Importantly, these results suggest that parents may increase negative feelings toward their adolescent children. Hence, when an adolescent is already prone to distress, an anxious parent may easily exaggerate their reaction. This finding is in line with previous studies emphasizing the dynamics of the parent-adolescent relationship. These dynamics are characterized by a progressive decrease in parental influence

and emotional support (Branje, 2018; Keijsers et al., 2009) along with the development of increased autonomy and independence (Blos, 1979; De Goede et al., 2009), and a perception of parental power as being unwanted or intrusive (De Goede et al., 2009; Smetana et al., 1991). In line with this view, Keijsers and colleagues (2009) have found that parental influence on adolescents' decision-making declines over time as they become more cognitively adept at making well-considered decisions for themselves (Noller, 1995). Such behavior reflects a change in the adolescent's perception of parental authority; from a positive and legitimate stand to a neutral and less legitimate function while forming increasingly egalitarian relationships (De Goede et al., 2009). The results of the present study may suggest that such changes may be accelerated when the parents exhibit a high level of anxiety.

In addition, we showed that when the parents exhibit a low level of anxiety, and their adolescent children exhibit high levels of anxiety, interpersonal ER better reduces distress compared to self-ER. These results suggest that low, anxious parents could choose an adaptive regulatory strategy for their anxious adolescents, compared to strategies that were chosen by the adolescents themselves in the self-ER condition. This evidence supports the claim that in certain conditions, interpersonal relationships can offer a new route to ER (Levy-Gigi & Shamay-Tsoory, 2017). Moreover, the findings support and link two lines of studies. The first set of studies shows that highly anxious adolescents exhibit greater difficulties in employing effective and highly adaptive ER and demonstrate lower self-ER efficacy than non-anxious adolescents (Carthy et al., 2010; Cisler et al., 2010; Schäfer et al., 2017). The second set of studies emphasizes the pivotal role of their parents, showing that anxious adolescents particularly benefit from emotional support provided by their parents (Fabes et al., 2001; Remmes & Ehrenreich-May, 2014; Stocker et al., 2007).

Finally, we revealed that when both the regulating parents and their adolescent children exhibit a low level of anxiety, there is no difference between self and interpersonal ER. These results reflect the general tendency and emphasize the important role of anxiety in the tension between self and interpersonal ER. Future studies may aim to compare self and interpersonal ER in adolescents with low anxiety and their peers or teachers to test the specificity of our results (Stocker et al., 2007) and examine whether, similar to adults, these adolescents can benefit from interpersonal ER with different regulators (Levy-Gigi & Shamay-Tsoory, 2017).

The current study has several limitations. First, we focused on functioning, non-clinical individuals. While this approach reflects the current attitude, which emphasizes recognition of impaired mechanisms while looking at the

full range of human behavior, future studies may aim to compare self and interpersonal ER in clinically diagnosed parents and/or adolescents. Second, our performance-based paradigm may have limited external validity since people communicate their reactions and suggestions spontaneously in day-to-day life and will likely not tell one another which regulatory strategies to engage in explicitly. Nevertheless, our paradigm represents a controlled setting in which the basic components observed in interpersonal ER are examined. The regulator in these controlled settings offers the target ER strategies in real-time.

In conclusion, the present study is the first crucial step toward understanding interpersonal ER in adolescents. Our findings highlight the crucial role of anxiety experienced by the parents and/or adolescents in the tendency to benefit from self or interpersonal ER. The findings may have important therapeutic implications, leading to the development of new intervention tools which take advantage of adaptive parental support to reduce distress in highly anxious adolescents.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10608-023-10394-5>.

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