Why Did You Do That? Because I Thought It Would Work! The Role of Perceived Effectiveness in Adolescent Emotion Regulation

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Abstract

Much is known about outcomes associated with the use of adaptive and maladaptive emotion regulation (ER) strategies. However, less research has explored predictors of ER strategy use. The present study examined perceived effectiveness of strategies (i.e., how effective one believes a strategy is at decreasing negative affect or increasing positive affect) as a predictor of strategy use. The sample of 139 adolescents (M_{age} = 15.50, 60.4% male) reported their use of ER strategies for positive and negative emotions and how effective they believed each strategy was at changing their emotional state in the desired direction (i.e., more positive, less negative). Covarying age and sex, four hierarchical linear regression models indicated that perceived effectiveness was associated with strategy use in each case. These findings indicate that adolescents are more likely to use ER strategies when they believe they are effective. The study has important educational and clinical implications about teaching youth about ER.

Keywords: adolescence, emotion beliefs, emotion regulation, perceived effectiveness

Emotions are an essential component of human life. While emotions have adaptive functions (e.g., facilitate decision-making), they also often require regulation (Gross, 1998b). Emotion regulation (ER) is defined as "the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions" (Gross, 1998b, p. 275). Research in this area has focused on outcomes associated with an individual's use of ER strategies (e.g., psychopathology; see Aldao, Gee, De Los Reyes, & Seager, 2016 for a review). Research on predictors of ER in youth has often been limited to studies involving young children and focused on the influence of relationships (e.g., attachment; Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000) or individual factors (e.g., temperament; Gentzler, Ramsey, Yi, Palmer, & Morey, 2013). Conversely, less is explicitly known about the beliefs or perceptions that may predict, precede, or influence an individual's choice to use certain ER strategies, specifically among adolescents. Managing emotions can be especially challenging during adolescence given that emotions may be particularly intense during this period (Larson, Moneta, Richards, & Wilson, 2002). Therefore, understanding what may predict or influence adolescents' use of less effective ER strategies could be useful in the development of educational or clinical interventions. We propose that if adolescents believe a strategy is effective, or is going to change their emotion in the desired direction (i.e., less negative or more positive), they will be more likely to use that strategy to regulate their emotions.

Adaptive and Maladaptive Emotion Regulation

Regulatory strategies are generally regarded as adaptive or maladaptive based on their association with different outcomes. Research is relatively consistent in terms of classifying strategies as adaptive or maladaptive

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(Aldao & Nolen-Hoeksema, 2012; Augustine & Hemenover, 2009), although context should be considered when viewing emotions and their regulation as adaptive or effective (Aldao & Nolen-Hoeksema, 2012).

Adaptive ER strategies with negative affect (NA) are those that show negative associations with outcomes such as psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Aldao & Nolen-Hoeksema, 2012) and positive relations to outcomes like well-being (Gross & John, 2003). Strategies such as problem solving, distraction, support-seeking, and reappraisal have been considered adaptive strategies with NA (Aldao et al., 2010; Augustine & Hemenover, 2009; Gross & John, 2003; Webb, Miles, & Sheeran, 2012). For instance, kindergarteners that use more adaptive ER strategies are more successful academically and are rated as more productive by their teachers (Graziano, Reavis, Keane, & Calkins, 2007). Further, high school students with higher emotional intelligence (e.g., manage their emotions in adaptive ways) are also more socially competent and successful academically (Márquez, Martín, & Brackett, 2006). In addition to how ER relates to general outcomes, research has extensively explored the immediate effectiveness of ER strategies with NA (i.e., how successful a strategy is at decreasing, increasing, or maintaining emotional intensity; Sheppes & Gross, 2012; see Augustine & Hemenover, 2009 and Webb et al., 2012 for reviews). These experimental studies are generally consistent with correlational work, suggesting that strategies such as reappraisal are more effective at decreasing the overall experience of NA compared to other strategies like suppression (Gross, 1998a).

Conversely, maladaptive ER strategies with NA have been positively associated with negative outcomes (e.g., psychopathology; Aldao et al., 2010). Strategies such as avoidance, rumination, venting, and suppression are considered maladaptive forms of ER with NA (Aldao & Nolen-Hoeksema, 2012; Augustine & Hemenover, 2009; Webb et al., 2012). For example, studies with college students have shown that individuals who use fewer maladaptive ER strategies also engage in fewer risky behaviors (Rivers et al., 2013), have more positive relationships (Gross & John, 2003), and report less conflict with friends (Lopes et al., 2011). In experimental research, maladaptive strategies like suppression are less effective at decreasing resulting physiological arousal or subjective experience of NA (Gross, 1998a).

Similar to ER with NA, ER strategies with positive affect (PA) are generally categorized as adaptive or maladaptive based on their associations with outcomes. Specifically, savoring, maximizing, and capitalizing strategies that up-regulate or increase positive emotions are considered adaptive (e.g., reflecting on positive emotions, sharing PA with others; Bryant, 2003; Feldman, Joormann, & Johnson, 2008; Gentzler, Morey, Palmer, & Yi, 2012; Livingstone & Srivastava, 2012). Experiencing and expressing PA has been shown to broaden our awareness and assist in building enduring skills and relationships (see Fredrickson, 2013 for a review). Further, the use of savoring strategies in youth has been related to lower levels of depression (Bijttebier, Raes, Vasey, & Feldman, 2012; Fredrick, Mancini, & Luebbe, 2019; Moran, Root, Vizy, Wilson, & Gentzler, 2019; Nelis, Bastin, Raes, & Bijttebier, 2019). In contrast, dampening and minimizing strategies that down-regulate or decrease PA have been considered maladaptive (e.g., think about things that could go wrong, downplay the significance of PA or positive events; Feldman et al., 2008; Gentzler, Palmer, & Ramsey, 2016). Dampening responses in youth are associated with elevated depressive symptoms (Moran et al., 2019; Raval et al., 2019) and more internalizing and externalizing problems (Gentzler et al., 2012). The direct effectiveness of ER strategies with PA has been less explicitly explored in comparison to ER strategies with NA. However, correlational research shows that the use of savoring strategies results in sustained PA about positive life events in youth (Gentzler et al., 2012; Jose, Lim, & Bryant, 2012) and adults (Langston, 1994). Additionally, positive ER interventions support the effectiveness of attentional deployment, cognitive change, and response modulation (Quoidbach, Mikolajczak, & Gross, 2015).

Although we have a wealth of knowledge regarding the outcomes related to the use of adaptive and maladaptive ER strategies, we do not know enough about why individuals choose to use the specific ER strategies that they do. It is important to examine predictors of ER strategy choice, as this would identify additional target areas for prevention and intervention efforts. Recent work has begun to delve into individuals' beliefs about the malleability of emotions, or the belief that we can change and control our emotions (e.g., Ford, Lwi, Gentzler, Hankin, & Mauss, 2018; Tamir, John, Srivastava, & Gross, 2007). Therefore, individuals' beliefs about how effective ER strategies are at changing their emotions in the desired direction (i.e., increase PA, decrease NA) could provide additional insight into why individuals choose to use particular ER strategies.

Perceived Effectiveness and Emotion Regulation

Surprisingly few studies have examined how individuals think about particular ER strategies. How effective an individual believes an ER strategy is at changing their experienced emotional intensity may be important in understanding why individuals choose to employ specific ER strategies. In one exception, perceived

effectiveness of ER strategies for anger and sadness were examined in elementary-aged children, though not in relation to the children's use of ER strategies (Waters & Thompson, 2014). The study's results indicated that children who rated a strategy as effective for anger, tended to rate the same strategy as effective for sadness (e.g., venting emotions). However, other strategies were rated as especially effective for anger (e.g., problem solving) or sadness (e.g., seek adult support). These findings suggest that even at early ages there is some emotion specificity in perceived effectiveness of strategies.

In a related study, ten- to thirteen-year-old adolescents were significantly more likely to endorse using an ER strategy when they perceived that that strategy would enhance their mood (Reijntjes, Stegge, Terwogt, & Hurkens, 2007). Another study used an experience sampling methodology to examine ER in college-aged participants. Interestingly, self-reported perception of a strategy's impact on emotional intensity did not directly relate to actual reported change in mood (Heiy & Cheavens, 2014). This finding suggests that individuals may use a strategy because they believe it will be effective, even though in reality the strategy is ineffective and does not actually change the way they feel. Another study examined beliefs about the consequences of ER strategies by using a composite ER beliefs score (beliefs about maladaptive strategies minus beliefs about adaptive strategies) to predict individual's behavioral choice of ER strategies in negative scenarios. Findings showed that ER beliefs were positively related to ER behavioral choices (Ortner, Briner, & Marjanovic, 2017).

Other research in the domain of engagement in risky activities has indicated that adolescents who engage in risky activities perceive the activities as more beneficial and less risky than adolescents who do not engage in these behaviors (Zimmermann, 2010). Moreover, perceived benefit was the most powerful predictor of engagement in risk behavior (compared to sensation seeking, sex, and age; Zimmermann, 2010). Taken together with the limited research on youth's beliefs about ER, previous research suggests that believing an ER strategy would be effective in changing affect in the anticipated direction (i.e., lower NA, greater PA) may predict greater use of those types of ER strategies, regardless of whether the strategy actually changes their emotions.

The Present Study

The present study examined perceived effectiveness of ER strategies as a potential reason some adolescents are more likely than others to use maladaptive strategies to regulate their emotions. Based on previous research, we propose that if adolescents believe a strategy is effective, or is going to change their emotion in the desired direction (i.e., less negative or more positive), they will be more likely to use that strategy to regulate their emotions. To extend previous work, we examined adolescents' use of ER strategies and believed the hypothesized positive associations between perceived effectiveness and ER strategy use would hold across all types of strategies: adaptive and maladaptive strategies with both NA and PA.

Method

Participants

Participants were 139 adolescents ranging from 14 to 18 years old (M = 15.50, SD = .89; 60.4% male) who were recruited from two high schools. Eighty percent of adolescents also had at least one caregiver participate, although caregiver data is only used in the present study to better explain sample demographics. The adolescent participants reflected the socio-demographic characteristics of the areas from which they were recruited where residents are generally middle to higher income and mostly White. Specifically, 79.9% of the sample self-identified as White, 9.4% as African-American, 5.6% as other or multiple ethnicities, 2.9% as Asian or Asian-American, 1.4% as Hispanic/Latin-American, and .7% as Pacific-Islander or Native Hawaiian. Of the participating caregivers, most reported that adolescents resided in homes with two parents (84.1%) and reported upper-middle class annual incomes (76% earned $80,000 or more). Additionally, caregivers were well-educated with the majority having completed a 4-year college degree or further graduate degrees (70.2% of mothers; 81.8% of fathers). The sample of 139 was drawn from a larger sample of 143 adolescents, but four participants were excluded due to patterned responding (n = 1) and incomplete data (n = 3).

Procedure

An overview letter of the study, a caregiver contact information form, and an informed consent form for caregivers to sign on the adolescent's behalf were distributed in two high schools. For adolescents with caregiver consent, surveys were administered during a designated time at school. Assent was collected and adolescents were given approximately 45 minutes to complete the survey. They received $20 for their participation. Most adolescents also had at least one caregiver complete a survey, either online or on paper, with questions pertaining to socio-demographic information and various topics (e.g., beliefs about emotions, emotion socialization). Caregivers also received $20 for participating. Only demographic information reported by caregivers was used in the present study.

Materials

Use of emotion regulation strategies with negative affect. To assess ER strategies with NA, the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA; Gullone & Taffe, 2012), a modified version of the Emotion Regulation Questionnaire (Gross & John, 2003), was used. Adolescents reported their use of cognitive reappraisal and expressive suppression as forms of ER with NA. An example reappraisal item is "When I want to feel less bad (e.g., sad, angry, or worried), I think about something different." and an example suppression item is "I control my feelings by not showing them." The ERQ-CA reappraisal and suppression scales have shown good reliability in the past (α = .82-.86 and α = .69-.79, respectively) as well as sound test-retest reliability over a 12-month period (reappraisal ICC = .37-.47, suppression ICC = .40-.63; Gullone & Taffe, 2012). To assess ER strategies beyond reappraisal and suppression, six additional items were created to examine support-seeking, avoidance, distraction, rumination, problem-solving, and venting (based on Gentzler et al., 2012). An example item from this scale is: "I talk to someone about my negative feelings or the problem." Each item was rated on a 7-point Likert-type scale (1 = Strongly disagree to 7 = Strongly agree).

All items were aggregated to create two scales: Use of Adaptive ER with NA and Use of Maladaptive ER with NA. The adaptive scale contained six reappraisal items from the ERQ-CA and the single items support-seeking, distraction, and problem-solving (α = .79). Although these particular items have not been previously aggregated (this reappraisal scale with the added ER items), prior research has validated that these types of ER are generally effective or adaptive ways to regulate negative emotions (e.g., Aldao et al., 2010; Contreras et al., 2000; Fields & Prinz, 1997; Reijntjes, Stegge, Terwogt, Kamphuis, & Telch, 2006). The maladaptive scale contained four suppression items from the ERQ-CA and the single items avoidance, rumination, and venting (α = .68). Similarly, research has shown that these ER strategies are maladaptive and predict sustained negative emotions, psychopathology, and poorer social skills (Aldao et al., 2010; Contreras et al., 2000; Fields & Prinz, 1997). For both the adaptive and maladaptive scales, higher scores indicate that the adolescent reported greater use of those strategies.

Perceived effectiveness of emotion regulation strategies with negative affect. Adolescents then reported their perceived effectiveness of each strategy, operationalized as the way in which they think the use of each strategy changes their experience of NA (Think about when you have responded in these ways when feeling UPSET or BAD. If you don't respond in these ways, try to imagine how these responses may or may not change how you feel. How would each response change how you feel when feeling UPSET or BAD?). This scale consists of 12 items about how effective adolescents perceive ER strategies with NA to be (three reappraisal and three suppression items from the ERQ-CA and a single item of each of the additional NA regulation strategies). Responses were rated using a 5-point Likert-type scale (1 = Makes me feel really bad [or a lot worse], 2 = Makes me feel a little bad or worse, 3 = Does not change how I feel or unsure, 4 = Makes me feel a little good or better, 5 = Makes me feel really good [or a lot better]).

Similar to scales of ER strategy use, perceived effectiveness items were separated into two scales. The Perceived Effectiveness of Adaptive ER with NA scale consists of three reappraisal items, and the single items sharing, distraction, and problem-solving (α = .70). The Perceived Effectiveness of Maladaptive ER with NA scale consists of three suppression items and the single items avoidance, rumination, and venting (α = .61). Higher scores on these scales indicate that the adolescent believes the strategy is effective and makes them feel better (i.e., decreases their NA), whereas lower scores indicate that they believe the strategy is ineffective and makes them feel worse (i.e., increases their NA).

Use of emotion regulation strategies with positive affect. Next, adolescents reported their use of specific strategies to regulate PA using the Positive Affect and Responses Survey (PAARS). This scale was based on previous event-specific savoring and dampening scales (Gentzler, et al., 2012), but was modified in the present study to measure more general experiences of PA. Specifically, it includes 16 items regarding adolescents' use of

ER strategies to increase or decreases PA and is rated on a 5-point Likert-type scale (1 = Not at all likely to 5 = Very likely).

Similar to previously discussed measures, the PAARS consists of two scales: Use of Adaptive ER with PA (i.e., strategies that sustain or up-regulate PA) and Use of Maladaptive ER with PA (i.e., strategies that down-regulate PA). In the PAARS, the adaptive scale is made up of 11 items (α = .79; e.g., When you are feeling really good and happy, how likely are you to…think about how good you feel?"), and the maladaptive scale consists of five items (α = .47; "…think about how things could go wrong?"). Higher scores indicate that the adolescent is more likely to use that type of ER strategy with PA.

Perceived effectiveness of emotion regulation strategies with positive affect. Finally, adolescents reported how they think the use of specific ER strategies change their experience of PA (Think about when you have responded in these ways when feeling GOOD or HAPPY. If you don't respond in these ways, try to imagine how these responses may or may not change how you feel. How do you think each response would change how you feel?). This scale includes 16 items about how effective adolescents perceive ER strategies with PA to be and is rated using a 5-point Likert-type scale (1 = Makes me feel really bad [or a lot worse] to 5 = Makes me feel really good [or a lot better]).

Similar to the PAARS, the perceived effectiveness of ER strategies for PA measure consists of two scales. The Perceived Effectiveness of Adaptive ER with PA scale is made up of 11 items (α = .79), whereas the Perceived Effectiveness of Maladaptive ER with PA scale consists of five items (α = .66). Higher scores indicate that the adolescent believes the strategy is effective and makes them feel better (i.e., maintains or increases PA), while lower scores indicate the belief that the strategy is ineffective and makes them feel worse (i.e., decreases PA).

Results

Preliminary Analysis

Scale scores were computed for all participants with 80% of the items completed (only three participants did not have all relevant scales computed). One participant was indicated as an outlier on the Use of Adaptive ER with NA scale by a Mahalanobis distance greater than 16.27 ($p < .001$) and was excluded from analyses using that variable. All variables were assessed for normality and original variables were used to conduct all analyses.[1]

The main study variables' means, standard deviations, and bivariate correlations are presented in Table 1. Perceived effectiveness of ER strategies was moderately correlated with use of the same type of ER strategy in all cases (r = .33-.54). Age and sex effects were also examined. Age was significantly correlated with Use of Adaptive ER with PA (r = .20), suggesting older adolescents use strategies that up-regulate PA more than younger adolescents. Additionally, independent samples *t*-tests revealed two significant sex differences. For Perceived Effectiveness of Maladaptive ER with NA, males (M = 2.85, SD = .52) reported greater perceived effectiveness than females (M = 2.42, SD = .67), $t(95.9) = 4.05$, $p < .001$[2]. For Perceived Effectiveness of Maladaptive ER with PA, males (M = 2.64, SD = .52) reported greater perceived effectiveness than females (M = 2.17, SD = .55), $t(136) = 5.09$, $p < .001$.

Primary Analysis

Four hierarchical linear regression models were performed to examine the associations among perceived effectiveness of ER strategies and use of ER strategies (see Table 2). In step one of each analysis, age and sex were covaried. Because of the moderate correlations between each of the perceived effectiveness variables and the ER strategy use variables, all four types of perceived effectiveness beliefs were entered into step two. Previous research has combined beliefs about, and behavioral choices of, adaptive and maladaptive strategies into a single ER belief score (Ortner et al., 2017). However, we believe that examining perceptions and use of different valence (PA and

[1] A square root transformation was originally performed on the Perceived Effectiveness of Adaptive ER with PA scale to reduce significant skewness. However, when analyses conducted with both the transformed and original variable were compared, no appreciable differences were present. Therefore, analyses presented used the original, not transformed variable.

[2] Levene's test indicated unequal variances (F = 7.29, p = .008) so Welch's t was reported.

Table 1

Descriptive Statistics and Bivariate Correlations (N = 137-139)

	Mean (SD)	1	2	3	4	5	6	7	8
Use of Maladaptive ER with NA	3.68 (1.04)	---							
Perceived Effectiveness of Maladaptive ER with NA	2.68 (.62)	**.33*****	---						
Use of Adaptive ER with NA	4.54 (.95)	-.06	.02	---					
4. Perceived Effectiveness of Adaptive ER with NA	3.71 (.58)	-.11	-.09	**.54*****	---				
5. Use of Maladaptive ER with PA	2.33 (.66)	.47***	.23**	-.19*	-.13	---			
6. Perceived Effectiveness of Maladaptive ER with PA	2.45 (.58)	.31***	.64***	.01	-.11	**.44*****	---		
7. Use of Adaptive ER with PA	3.23 (.63)	-.22**	-.15	.51***	.36***	-.22**	-.18*	---	
8. Perceived Effectiveness of Adaptive ER with PA	3.63 (.53)	-.27**	-.17*	.33***	.46***	-.20*	-.19*	**.50*****	---

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. NA = negative affect. PA = positive affect. ER = emotion regulation. Raw scores are reported. Pairwise deletion. For each type and valence of ER, the correlations between perceived effectiveness and its corresponding use is bolded.

NA) and adaptive vs. maladaptive ER strategies individually will give us a more nuanced understanding of the predictors of ER strategy use.

In the first model predicting Use of Maladaptive ER with NA, the full model was significant (see Table 2, $R^2 = .18$). Step one with adolescent age and sex was not significant. However, in line with our hypothesis, higher Perceived Effectiveness of Maladaptive ER with NA was marginally associated with greater use of maladaptive ER strategies with NA. Unexpectedly, greater Perceived Effectiveness of Adaptive ER with PA was significantly related to less use of maladaptive ER with NA.

In the second model predicting Use of Adaptive ER with NA, the full model accounted for 31% of the variance. Neither age, nor sex, was significant. As hypothesized, Perceived Effectiveness of Adaptive ER with NA was significantly associated with use of Adaptive ER with NA.

In the third model predicting likelihood of using Maladaptive ER with PA, the full model was significant, $R^2 = .24$. Age and sex were unrelated, but, as expected, Perceived Effectiveness of Maladaptive ER with PA was significantly related to greater use of Maladaptive ER strategies with PA.

In the fourth and final model predicting the likelihood of using Adaptive ER strategies with PA, the full model accounted for 33% of the variance. Age was significantly, and sex marginally, related to increased use of adaptive strategies with PA. Specifically, older adolescents and girls regulate positive emotions by using effective PA strategies more than younger adolescents and boys. As hypothesized, higher Perceived Effectiveness of

Table 2

Hierarchical Linear Regression Models

	R^2	df	F_{Change}	Beta
Use of Maladaptive ER with NA				
Step 1	.02	2,134	1.27	
-Age				.02
-Sex				-.01
Step 2	.18	4,130	6.16^{***}	
-Perceived Effectiveness: Maladaptive ER with NA				**$-.21^{+}$**
-Perceived Effectiveness: Adaptive ER with NA				.02
-Perceived Effectiveness: Maladaptive ER with PA				.14
-Perceived Effectiveness: Adaptive ER with PA				$.21^{*}$
Use of Adaptive ER with NA				
Step 1	.00	2,133	.20	
-Age				-.01
-Sex				.09
Step 2	.31	4,129	14.39^{***}	
-Perceived Effectiveness: Maladaptive ER with NA				.05
-Perceived Effectiveness: Adaptive ER with NA				**$.50^{***}$**
-Perceived Effectiveness: Maladaptive ER with PA				.09
-Perceived Effectiveness: Adaptive ER with PA				.11
Use of Maladaptive ER with PA				
Step 1	.00	2,134	.19	
-Age				-.08
-Sex				.15
Step 2	.24	4,130	10.30^{***}	
-Perceived Effectiveness: Maladaptive ER with NA				-.08
-Perceived Effectiveness: Adaptive ER with NA				-.05
-Perceived Effectiveness: Maladaptive ER with PA				**$.54^{***}$**
-Perceived Effectiveness: Adaptive ER with PA				-.08
Use of Adaptive ER with PA				
Step 1	.06	2,134	4.52^{*}	
-Age				$.25^{**}$
-Sex				$.16^{*}$
Step 2	.33	4,130	13.13^{***}	
-Perceived Effectiveness: Maladaptive ER with NA				.02
-Perceived Effectiveness: Adaptive ER with NA				$.17^{*}$
-Perceived Effectiveness: Maladaptive ER with PA				.02
-Perceived Effectiveness: Adaptive ER with PA				**$.41^{***}$**

Note. $^{+}$ $p < .06$. * $p < .05$. ** $p < .01$. *** $p < .001$. NA = negative affect. PA = positive affect. ER = emotion regulation. Sex coded 0 = male, 1 = female. Beta's are from the final step of the regression. Listwise deletion. Corresponding perceived effectiveness is bolded within each individual regression.

Adaptive ER with PA was significantly related to greater use of the corresponding strategies. Interestingly, higher Perceived Effectiveness of Adaptive ER with NA was also marginally related to greater use of adaptive strategies.

Discussion

The current study provided support for the notion that adolescents who perceive ER strategies as effective are more likely to use those strategies to regulate positive and negative emotions, regardless of whether the strategy is considered adaptive or maladaptive. This research also investigated the regulation of PA, which is less often studied, but still critical to understand given its associations with adolescents' well-being, depression, and internalizing and externalizing problems (Bijttebier et al., 2012; Gentzler et al., 2012). Overall, this study offers novel findings suggesting that adolescents' beliefs about how ER strategies work could be an important explanation for why they regulate their emotions in the ways that they do. Future research should investigate if changing adolescents' beliefs about ER strategy effectiveness changes their use of the strategies, which could have important prevention and intervention implications.

Following all proposed hypotheses, perceived effectiveness was associated with ER strategy use in each model presented above. The bivariate correlations as well as regression models suggest these effects were generally moderate in size. The only exception was for maladaptive ER strategies with NA, where the coefficient was only marginally significant. This weaker association is unfortunate, given that one of our ultimate goals is to help adolescents to stop using regulatory strategies that do not work. Interestingly, adolescents who use more maladaptive ER strategies with NA also perceive adaptive strategies with PA as less effective indicating there may be some general, shared variance in beliefs about ER that holds across both valence and adaptiveness of strategies. Future studies should examine if this finding is reflective of a general knowledge base about ER and emotions or if this is perhaps a symptom of psychopathology.

Overall, our study suggested that adolescents' perceptions of ER strategy effectiveness matter. Our results parallel other areas of research, such as engagement in risk behavior (Zimmermann, 2010). Additionally, related work with emotions has shown that beliefs about emotions are important. For instance, implicit theories suggest that believing emotions are malleable is positively associated with well-being and adjustment (Ford et al., 2018; Tamir et al., 2007). Research on emotional intelligence and socio-emotional competence also suggests that knowledge about ER is a critical component of adaptive psychological adjustment (Halberstadt, Denham, & Dunsmore, 2001; Mayer, Roberts, & Barsade, 2008). However, no studies, except for Reijntjes and colleagues (2006), have explicitly tied beliefs about ER strategy effectiveness to adolescents' actual use of ER strategies. Thus, our study offers novel information about why adolescents use adaptive and maladaptive ER and extends this work to ER with PA.

Our findings could have important applications for educational and clinical contexts. Some existing educational programs focused on Social and Emotional Learning (SEL) teach youth adaptive ER and coping skills, but most (87%) focus on preschool and elementary-aged children (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Additionally, while self-control and effective regulation of emotions are core competencies in SEL programs, our study suggests that it may be beneficial to focus on the adolescent age period and teach students about the effectiveness of specific ER strategies. In addition, a number of clinical approaches also aim to help clients learn more effective ER approaches as part of treatment of psychopathology. For instance, ER training has been shown to enhance the positive outcomes associated with cognitive behavioral therapy when standard parts of the therapy are replaced with training focused on effective ER skills (Berking, Wirtz, Svaldi, & Hofmann, 2014). Further, a recent review found that poor ER in participants with major depressive disorder is often due to unskillful selection of appropriate or adaptive strategies rather than an inability to effectively use the strategies (Liu & Thompson, 2017). These previous findings suggest that changing individual's beliefs about the effectiveness of adaptive ER strategies, and the ineffectiveness of maladaptive ER strategies, could be especially important within both standard SEL education and treatment of clinical populations. The present study suggests that perceptions about the effectiveness of ER strategies are likely another important belief that should be targeted in adolescents with difficulties regulating their emotions.

Limitations and Future Directions

Although the present study presents a promising initial step in research on perceived effectiveness of ER strategies, there are limitations. First, the current study involved a predominately upper-class, White sample of adolescents. Prior research has indicated that ER and regulatory behaviors may vary by economic status, and race or ethnicity (e.g., Evans & English, 2002; Steele, Elliot, & Phipps, 2003). Moreover, research suggests that using effective ER strategies, such as reappraisal, may be especially important for lower income or more disadvantaged individuals (Hittner, Rim, & Haase, 2018; Troy, Ford, Mcrae, Zarolia, & Mauss, 2017). Thus, replications with more ethnically and socioeconomically diverse samples are necessary.

Second, the present study was cross-sectional in nature. Therefore, longitudinal research is needed to determine the direction of effects. While we would posit that perceived effectiveness predicts the use of ER strategies over time, it also may be that perceived effectiveness and use of ER strategies exhibit a bidirectional association such that individuals perceive a strategy as more effective after using it. Additionally, temporal priming could influence perceptions and choice of ER strategies. To date, most research has either been correlational or has instructed individuals to use a specific ER strategy and then monitored brain activity and/or self-reported emotional intensity (e.g., McRae et al., 2012; Opitz, Cavanagh, & Urry, 2015). However, future research could instruct or prime participants to focus on short- vs. long-term consequences of their choice, and study how that may alter their perceptions about the effectiveness of different ER strategies and their subsequent use of those strategies.

Third, even more critical is that perhaps the strategies that we deem maladaptive based on the literature do actually work for these adolescents (e.g., maybe some adolescents have become adept at avoidance where it does work to make them feel better). Moreover, we defined effective as decreasing NA and increasing PA. It is possible these "maladaptive strategies" serve the intended purpose for youth who are pursuing contra-hedonic states. Specifically, previous research has shown that adolescents report higher levels of contra-hedonic motives compared to adults (i.e., wanting to enhance or maintain NA or decrease PA; Riediger, Schmiedek, Wagner, & Lindenberger, 2009). This research suggests that sometimes adolescents want to feel badly. However, even with potential contra-hedonic goals, this study indicated that adolescents more often use strategies that they think will make them feel less NA or more PA.

Fourth, the current study examined ER for NA and PA generally, but prior research has shown that it may be beneficial to examine ER strategy use for specific emotions (e.g., Heiy & Cheavens, 2014; Liu & Thompson, 2017; Waters & Thompson, 2014). We also aggregated individual ER strategies into adaptive and maladaptive scales. However, research is beginning to find nuanced differences across individual ER strategies that are normally clumped together. For example, one study found that savoring strategies are differentially related to components of well-being (i.e., PA, life satisfaction; Quoidbach et al., 2010).

Finally, the measure of perceived effectiveness used in the present study instructed participants to imagine using ER strategies that they may not actually use. Future research investigating individuals' beliefs about ER effectiveness should differentiate between individuals who actually use the strategy and those who do not. For example, using an experience sampling methodology, where participants only reported on their use and the impact of strategies that they used in real-time, would help to eliminate this confound (Heiy & Cheavens, 2014).

Despite the limitations, the current study is an initial step in exploring the construct of perceived effectiveness in relation to ER strategy use. Future research should further explore perceptions of ER strategies' effectiveness in conjunction with other known predictors of ER strategy use (e.g., temperament; Lengua & Long, 2002). In general, longitudinal research is needed to understand the formation of ER beliefs (e.g., when are they formed and what predicts them), bidirectional effects with actual emotional outcomes, and whether changing adolescents' beliefs about ER strategies' effectiveness changes their use of those strategies. Overall, this line of work could have important clinical and educational applications to help youth rely on more effective ER strategies.

References

Aldao, A., Gee, D. G., De Los Reyes, A., & Seager, I. (2016). Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. *Development and Psychopathology, 28*, 927–946. https://doi.org/10.1017/S0954579416000638

Aldao, A. & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of Abnormal Psychology, 121*, 276–281. doi:10.1037/a0023598

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review, 30*, 217–37. doi:10.1016/j.cpr.2009.11.004

Augustine, A. A. & Hemenover, S. H. (2009). On the relative effectiveness of affect regulation strategies: A meta-analysis. *Cognition & Emotion, 23*, 1181–1220. doi:10.1080/02699930802396556

Berking, M., Wirtz, C. M., Svaldi, J., & Hofmann, S. G. (2014). Emotion regulation predicts symptoms of depression over five years. *Behaviour Research and Therapy, 57*, 13–20. doi:10.1016/j.brat.2014.03.003

Bijttebier, P., Raes, F., Vasey, M. W., & Feldman, G. C. (2012). Responses to positive affect predict mood symptoms in children under conditions of stress: A prospective study. *Journal of Abnormal Child Psychology, 40*, 381–389.

Bryant, F. (2003). Savoring Beliefs Inventory (SBI): A scale for measuring beliefs about savouring. *Journal of Mental Health, 12*, 175–196. doi:10.1080/0963823031000103489

Contreras, J. M., Kerns, K. A., Weimer, B. L., Gentzler, A. L., & Tomich, P. L. (2000). Emotion regulation as a mediator of associations between mother-child attachment and peer relationships in middle childhood. *Journal of Family Psychology, 14*, 111-124.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhacing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*, 405–432. doi:10.1111/j.1467-8624.2010.01564.x

Evans, G. W. & English, K. (2002). The environment of poverty: Multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development, 73*, 1238-1248.

Feldman, G. C., Joormann, J., & Johnson, S. L. (2008). Responses to positive affect: A self-report measure of rumination and dampening. *Cognitive Therapy and Research, 32*, 507–525. doi:10.1007/s10608-006-9083-0

Fields, L. & Prinz, R. J. (1997). Coping and adjustment during childhood and adolescence. *Clinical Psychology Review, 17*, 937-976.

Ford, B. Q., Lwi, S. J., Gentzler, A. L., Hankin, B., & Mauss, I. B. (2018). The cost of believing emotions are uncontrollable: Youths' beliefs about emotion predict emotion regulation and depressive symptoms. *Journal of Experimental Psychology: General, 147*, 1170-1190. doi: 10.1037/xge0000396

Fredrick, J. W., Mancini, K. J., & Luebbe, A. M. (2019). Maternal enhancing responses to adolescents' positive affect: Associations with adolescents' positive affect regulation and depression. *Social Development, 28*, 290–305. https://doi.org/https://doi.org/10.1111/sode.12326

Fredrickson, B. L. (2013). Positive emotions broaden and build. In P. Devine & A. Plant (Eds.), *Advances in Experimental Social Psychology* (1st ed., Vol. 47, pp. 1–53). Burlington: Academic Press. https://doi.org/10.1016/B978-0-12-407236-7.00001-2

Gentzler, A. L., Morey, J. N., Palmer, C. A., & Yi, C. Y. (2012). Young adolescents' responses to positive events: Associations with positive affect and adjustment. *The Journal of Early Adolescence, 33*, 663–683. doi:10.1177/0272431612462629

Gentzler, A. L., Palmer, C. A., & Ramsey, M. A. (2016). Savoring with intent: Investigating types of and motives for responses to positive events. *Journal of Happiness Studies, 17*, 937–958. https://doi.org/10.1007/s10902-015-9625-9

Gentzler, A. L., Ramsey, M. A., Yi, C. Y., Palmer, C. A., & Morey, J. N. (2013). Young adolescents' emotional and regulatory responses to positive life events: Investigating temperament, attachment, and event characteristics. Journal of Positive Psychology, 9, 108–121. https://doi.org/10.1080/17439760.2013.848374

Graziano, P. A., Reavis, R. D., Keane, S. P., & Calkins, S. D. (2007). The role of emotion regulation in children's early academic success. *Journal of School Psychology, 45*, 3–19. https://doi.org/10.1016/j.jsp.2006.09.002

Gross, J. J. (1998a). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology, 74*, 224–237. doi:10.1037/0022-3514.74.1.224

Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271–299. doi:10.1037/1089-2680.2.3.271

Gross, J. J. & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348–362. doi:10.1037/0022-3514.85.2.348

Gullone, E. & Taffe, J. (2012). The Emotion Regulation Questionnaire for Children and Adolescents (ERQ–CA): A psychometric evaluation. *Psychological Assessment, 24*, 409–417. doi:10.1037/a0025777

Halberstadt, A. G., Denham, S. A., & Dunsmore, J. C. (2001). Affective social competence. *Social Development, 10*, 79-119.

Heiy, J. E. & Cheavens, J. S. (2014). Back to Basics : A Naturalistic Assessment of the Experience and Regulation of Emotion. *Emotion, 14*, 878–891. doi:10.1037/a0037231

Hittner, E. F., Rim, K. L., & Haase, C. M. (2018). Socioeconomic status as a moderator of the link between reappraisal and anxiety: Laboratory-based and longitudinal evidence. *Emotion.* Advance online publication. doi.org/10.1037/emo0000539

Jose, P. E., Lim, B. T., & Bryant, F. B. (2012). Does savoring increase happiness? A daily diary study. *The Journal of Positive Psychology, 7*, 176–187. https://doi.org/10.1177/0192513X12437708

Langston, C. A. (1994). Capitalizing on and coping with daily-life events: Expressive responses to positive events. *Journal of Personality and Social Psychology, 67*, 1112–1125. https://doi.org/10.1037//0022-3514.67.6.1112

Larson, R. W., Moneta, G., Richards, M. H., & Wilson, S. (2002). Continuity, stability, and change in daily emotional experience across adolescence. *Child Development, 73*, 1151–1165. doi:10.1111/1467-8624.00464

Lengua, L. J. & Long, A. C. (2002). The role of emotionality and self-regulation in the appraisal-coping process: Tests of direct and moderating effects. *Applied Developmental Psychology, 23*, 471-493.

Liu, D. Y., & Thompson, R. J. (2017). Selection and implementation of emotion regulation strategies in major depressive disorder: An integrative review. *Clinical Psychology Review, 57*, 183–194. https://doi.org/10.1016/j.cpr.2017.07.004

Livingstone, K. M. & Srivastava, S. (2012). Up-regulating positive emotions in everyday life: Strategies, individual differences, and associations with positive emotion and well-being. *Journal of Research in Personality, 46*, 504–516. doi:10.1016/j.jrp.2012.05.009

Lopes, P. N., Nezlek, J. B., Extremera, N., Hertel, J., Fernández-Berrocal, P., Schütz, A., & Salovey, P. (2011). Emotion regulation and the quality of social interaction: Does the ability to evaluate emotional situations and identify effective responses matter? *Journal of Personality, 79*, 429–467. https://doi.org/10.1111/j.1467-6494.2010.00689.x

Márquez, P., Gil-Olarte, Martín, R. P., & Brackett, M. A. (2006). Relating emotional intelligence to social competence and academic achievement in high school. *Psicothema, 18*, 118–123.

Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008). Human abilities: Emotional intelligence. *Annual Review Psychology, 59*, 507–536. doi:10.1146/annurev.psych.59.103006.093646

McRae, K., Gross, J. J., Weber, J., Robertson, E. R., Sokol-Hessner, P., Ray, R. D., … Ochsner, K. N. (2012). The development of emotion regulation: An fMRI study of cognitive reappraisal in children, adolescents and young adults. *Social Cognitive and Affective Neuroscience, 7*, 11–22. https://doi.org/10.1093/scan/nsr093

Moran, K. M., Root, A. E., Vizy, B. K., Wilson, T. K., & Gentzler, A. L. (2019). Maternal socialization of children's positive affect regulation: Associations with children's savoring, dampening, and depressive symptoms. *Social Development, 28*, 306–322. https://doi.org/10.1111/sode.12338

Nelis, S., Bastin, M., Raes, F., & Bijttebier, P. (2019). How do my parents react when I feel happy? Longitudinal associations with adolescent depressive symptoms, anhedonia, and positive affect regulation. *Social Development, 28*, 255–273. https://doi.org/https://doi.org/10.1111/sode.12318

Opitz, P. C., Cavanagh, S. R., & Urry, H. L. (2015). Uninstructed emotion regulation choice in four studies of cognitive reappraisal. *Personality and Individual Differences, 86*, 455–464. https://doi.org/10.1016/j.paid.2015.06.048

Ortner, C. N. M., Briner, E. L., & Marjanovic, Z. (2017). Believing is doing: Emotion regulation beliefs are associated with emotion regulation behavioral choices and subjective well being. *Europe's Journal of Psychology, 13*, 60–74. https://doi.org/10.5964/ejop.v13i1.1248

Quoidbach, J., Berry, E. V., Hansenne, M., & Mikolajczak, M. (2010). Positive emotion regulation and well-being: Comparing the impact of eight savoring and dampening strategies. *Personality and Individual Differences, 49*, 368–373. https://doi.org/10.1016/j.paid.2010.03.048

Quoidbach, J., Mikolajczak, M., & Gross, J. J. (2015). Positive interventions: An emotion regulation perspective. *Psychological Bulletin, 141*, 655–693. https://doi.org/10.1037/a0038648

Raval, V. V., Luebbe, A. M., & Sathiyaseelan, A. (2019). Parental socialization of positive affect, adolescent positive affect regulation, and adolescent girls' depression in India. *Social Development, 28*, 274–289. https://doi.org/https://doi.org/10.1111/sode.12325

Reijntjes, A., Stegge, H., Terwogt, M. M., & Hurkens, E. (2007). Children's depressive symptoms and their regulation of negative affect in response to vignette depicted emotion-eliciting events. *International Journal of Behavioral Development, 31*, 49–58. https://doi.org/10.1177/0165025407073541

Reijntjes, A., Stegge, H., Terwogt, M. M., Kamphuis, J. H., & Telch, M. J. (2006). Emotion regulation and its effects on mood improvement in response to an in vivo peer rejection challenge. *Emotion, 6*, 543-552.

Riediger, M., Schmiedek, F., Wagner, G. G., & Lindenberger, U. (2009). Seeking Pleasure and Seeking Pain. *Psychological Science, 20*, 1–7. doi:10.1111/j.1467-9280.2009.02473.x

Rivers, S. E., Bertoli, M. C., Brackett, M., Omori, M., Sickler, C., & Salovey, P. (2013). Emotion skills as a protective factor for risky behaviors among college students. *Journal of College Student Development, 54*, 172–183. https://doi.org/10.1353/csd.2013.0012

Sheppes, G. & Gross, J. J. (2012). Emotion regulation effectiveness: What works when. In I. Weiner, H. A. Tennen, & J. M. Suls (Eds.), *Handbook of Psychology, Personality, and Social Psychology* (2nd ed., pp. 391–403). Somerset, NJ: John Wiley & Sons.

Steele, R. G., Elliot, V., & Phipps, S. (2003). Race and health status as determinants of anger expression and adaptive style in children. *Journal of Social & Clinical Psychology, 22*, 40–58. doi.org/10.1521/jscp.22.1.40.22764

Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007). Implicit theories of emotion: Affective and social outcomes across a major life transition. *Journal of Personality and Social Psychology, 92*, 731–744. doi:10.1037/0022-3514.92.4.731

Troy, A. S., Ford, B. Q., McRae, K., Zarolia, P., & Mauss, I. B. (2017). Change the things you can: Emotion regulation is more beneficial for people from lower than from higher socioeconomic status. *Emotion, 17*, 141–154. doi.org/10.1037/emo0000210

Waters, S. F. & Thompson, R. A. (2014). Children's perceptions of the effectiveness of strategies for regulating anger and sadness. *International Journal of Behavioral Development, 38*, 174–181. doi:10.1177/0165025413515410

Webb, T. L., Miles, E., & Sheeran, P. (2012). Dealing with feeling: A meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological Bulletin, 138*, 775–808. doi:10.1037/a0027600

Zimmermann, G. (2010). Risk perception, emotion regulation, and impulsivity as predictors of risk behaviours among adolescents in Switzerland. *Journal of Youth Studies, 13*, 83–99. doi:10.1080/13676260903173488