Control Yourself!: The Relationships between Self-Control, Emotion Regulation Strategies, and Social Interaction Anxiety

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Abstract

This study aims to clarify the relationships between self-control, emotion regulation, and social interaction anxiety. Self-control is defined as the ability to control and override one's thoughts. Emotion regulation is a way for people to adapt to stressful life events. It includes all processes that monitor, evaluate, and modify emotional reactions. Social interaction anxiety is the fear and avoidance of situations in which a person might be negatively evaluated by others. So far, the relationships between these concepts have not been thoroughly researched. However, it is important to do so, for both self-control and emotion regulation play a role in various beneficial outcomes in life. Both are important when interacting with other people, which relates them to social interaction anxiety. In the present study, the associations between these constructs are investigated by conducting regression analyses on subjects' scores on various questionnaires. The results show that high use of adaptive emotion regulation strategies and low use of maladaptive emotion regulation strategies relate to a lower score on social interaction anxiety. Self-control relates positively to adaptive emotion regulation strategies. Future research can hopefully help to further distinguish these relationships, especially regarding self-control. This may be helpful in developing and applying tailored therapies for people who struggle with either self-control, emotion regulation, or social interaction anxiety.

Keywords: self-control, emotion regulation, emotion regulation strategies, social interaction anxiety, depression

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Self-control belongs to the most important processes in the human personality (Gailliot et al., 2007), and emotion regulation is a big part of our everyday life (Gross, 1998). Both are essential parts of our lives, and deserve more attention in the literature. This study aims to clarify the relationships between self-control, emotion regulation, and social interaction anxiety.

Emotional distress contributes to failure at self-control (Baumeister, 2002). Self-control is the ability to control or override one's thoughts, emotions, urges, and behaviour (Gailliot et al., 2007). It overrides the first pattern of response to a situation chosen by a person and then replaces it with another pattern. These patterns of responses may include changing emotions. Thus, one way of controlling yourself is to use emotion regulation (Baumeister, 2002). This means that self-control and emotion regulation might be closely related. One might influence the other, either in a beneficial or disadvantageous manner. But research does not explicitly show whether people's levels of self-control relate to their ways of regulating their emotions.

Self-control is associated with volition, which encompasses all the processes that ensure that we can make choices and decisions, take responsibility, initiate and inhibit behaviour, make plans of action and carry out those plans. The self exerts control over itself and over the environment (Baumeister, Bratslavsky, Muraven & Tice, 1998). It provides the flexibility that is needed for successfully reaching goals and it facilitates adherence to rules and regulations. It is one of the most important processes in human personality (Gailliot et al., 2007).

People differ in the amount of self-control they have, which means self-control is a trait: some people have lots of it, and some do not (Baumeister, 2002). When people have high self-control, they are able to establish an optimal fit between them and their environment, which leads to living happier and healthier lives (Tangey, Baumeister, & Boone, 2004). High self-control has several beneficial outcomes: it is linked to better mental health and more effective coping skills (Gailliot et al., 2007). Tangey et al. (2004) relate high self-control to a higher grade point average, higher self-esteem, less binge eating and alcohol abuse, and more optimal emotional responses.

However, using one's self-control is not without consequences. Many researchers describe using self-control as depletion (Baumeister et al., 1998; Gailliot et al., 2007; Hagger, Wood, Stiff, & Chatzisarantis, 2010; Muraven & Baumeister, 2000; Tice, Baumeister,

Shmueli, & Muraven, 2007). Self-control is not infinite: it even relies on glucose as a limited energy source (Gailliot et al., 2007). Because self-control is also a trait, this means that some people run out of self-control faster than others. People who have depleted their self-control experience more negative affect, perceive situations as more difficult, and put in less effort than subjects who did not use their self-control before. People who have depleted their self-control are less capable to regulate their emotions after (Hagger et al., 2010).

Emotion regulation is a way for people to adapt to stressful live events (Garnefski & Kraaij, 2006). It includes all processes that monitor, evaluate, and modify emotional reactions. It helps people to keep control over their emotions (Garnefski & Kraaij, 2007; Gross, 1999). People use various strategies to regulate their emotions. The strategies distinguished in the current study can be found in Table A1 in Appendix A (Garnefski, Kraaij, & Spinhoven, 2001). They are all a part of a process called cognitive emotion regulation - a conscious, cognitive way of handling the intake of emotionally distressing information (Garnefski et al., 2001). This is part of the broader concept of emotion regulation.

Since emotion regulation is a way to deal with emotionally distressing information (Garnefski et al., 2001), the association between poor emotion regulation and anxiety is worth investigating. Research shows that reappraisal and acceptance are effective ways to moderate the feeling of fear and other negative emotions, while suppressing them is less effective (Amstadter, 2008; Campbell-Sills, Barlow, Brown, and Hofmann, 2006; Gross, 1998; Hofmann, Heering, Sawyer, & Asnaani, 2009). This suggests adaptive emotion regulation strategies help people to cope with fear, and maladaptive strategies do not. However, research on this topic has mainly focused on the emotion regulation strategies suppression, acceptance, and reappraisal (Amstadter, 2008; Campbell-Sills et al., 2006; Gross, 1998; Hofmann et al., 2009), while other strategies, such as blaming, catastrophizing, rumination, putting into perspective, positive refocusing, and refocus on planning (Garnefski et al., 2001) are limited in the literature.

Research by Tangey et al. (2004) implies that both regulating your emotions and controlling yourself are important when interacting with other people. They found that people with high self-control are more likely to have better relationships and interpersonal skills, secure attachment, and more adequate emotional responses compared to people with low self-control. Poor self-control and poor emotion regulation might lead to aggressive outbursts, which would not contribute to harmonious interactions (Tangey et al., 2004). Considering the benefits of self-control and emotion regulation in social settings and in life in general, and

emotion regulation's association with anxiety, it would be interesting to see how self-control and emotion regulation relate to social interaction anxiety.

Social interaction anxiety is the fear and avoidance of situations in which a person might be negatively evaluated by others (Kashdan, 2006). It is characterized by the experience of stress, discomfort, and fear in social situations. It can place a substantial personal and societal burden on a person (Kupper & Denollet, 2012). Socially anxious people experience less positive affect and often deplete their self-control energy source, because they are always trying to control themselves in social situations (Kashdan, Weeks, & Savostyanova, 2011). This shows the possible relationships between social interaction anxiety, emotion regulation, and self-control.

Other disorders, such as depression, may be of importance too, since depression is also characterized by the experience of many persistent and excessive negative emotions (Campbell-Sills et al., 2006). Ineffective emotion regulation may contribute to the development or maintenance of this disorder. Maladaptive emotion regulation strategies, such as suppression and avoidance, are related to depression (Campbell-Sills et al., 2006). Depression is negatively related to high scores on self-control, as is anxiety (Tangey et al., 2004). This shows the importance of depression in this context.

Consequently, it becomes clear what knowledge is still missing and why this is an important area of study. Firstly, emotion regulation is closely related to self-control, but it is not clear in what way exactly. Defining the relationship between self-control and emotion regulation could provide useful information for assessing and treating clients who have problems with self-control or with regulating their emotions. In general, more knowledge about this subject would help us understand why people regulate their emotions in a certain way. Because high self-control is linked to a broad range of desirable outcomes (Gailliot et al., 2007), it is a topic worth investigating. It will be helpful to see what the consequences of bad self-control are, for they must be recognized and used to develop ways to help people who struggle with problems due to low self-control.

Secondly, there has been some research on the associations between a few emotion regulation strategies, fear and depression (Amstadter, 2008; Campbell-Sills et al., 2006; Hofmann et al., 2009; Tangey et al., 2004), but not on the relationship between all adaptive and maladaptive emotion regulation strategies, self-control, and social interaction anxiety. Since regulating emotions and self-control are vital components of interacting with others (Tangey et al., 2004), investigating these relationships can provide important knowledge. With this knowledge, we can be aware of the consequences of using certain emotion

regulation strategies or of having a low level of self-control. People struggling with either self-control, emotion regulation or social interaction anxiety can benefit from this knowledge.

Therefore, three main questions rise: 1) How do self-control and emotion regulation relate to each other?, 2) How does emotion regulation relate to social interaction anxiety?, and 3) How does self-control relate to social interaction anxiety? Firstly, it is expected that people with a low score on the trait self-control use more maladaptive emotion regulation strategies and less adaptive strategies than people with high scores on self-control. Secondly, people who use more maladaptive emotion regulation strategies are expected to be more socially anxious than people who use more adaptive emotion regulation strategies. Furthermore, following the previous two hypotheses, it is expected that people with a low level of self-control are more prone to have social interaction anxiety.

Method

Participants

The population in the present study consisted of 209 first year psychology students at Tilburg University (M_{age} = 20.32 years, SD_{age} = 2.08, age range: 18 - 33 years). The sample consisted of 160 females (76.6%) and 49 males (23.4%). 6.7% of the subjects were under treatment for a psychological illness. 42.1% of the subjects were in a relationship (married, cohabiting, or not living together), and 57.9% was single, divorced or widowed. There were no inclusion or exclusion criteria, all first year students at Tilburg University were able to participate.

Setting

This study is a part of the INHIBIT study, which studies the psychobiology of interpersonal interaction as an approach for uncovering individual differences, and was carried out at Tilburg University. Before taking part in the study, the subjects signed an informed consent. They filled out two sets of questionnaires (in Dutch). Each set of questionnaires took approximately 40 minutes to complete, and the students could choose to fill them out online or on paper. The filling out could be done from home. The subjects received a reward in the form of subject credits. This study was approved by the ethical commission of Tilburg University.

Questionnaires

First, to measure levels of self-control, the Brief Self Control Scale (BSCS) was used. This scale was developed and validated by Tangey et al. (2004). The questionnaire consisted of 13 items, rated on a 5-point Likert scale, anchored from 1 *not at all like me* to 5 *very much like me*. An example of an item was 'I have a hard time breaking bad habits' [in Dutch: 'ik vind het moeilijk om met slechte gewoontes te stoppen']. The Brief Self Control scale was highly reliable (Cronbach's α = .83 and .85 and test-retest reliability = .87 in the studies by Tangey et al. (2004)). Cronbach's α in the present sample was .84. There was a strong support for the reliability and validity of the BSCS, although Tangey et al. (2004) pointed out that a possible problem with this questionnaire's validity was the way in which the BSCS correlates with social desirability.

The second questionnaire was the short version of the Cognitive Emotion Regulation Questionnaire (CERQ-short), which was used to measure the subjects' use of different emotion regulation strategies. Nine strategies were distinguished, derived from Garnefski et al. (2001). The strategies are described in Table A1 in Appendix A. The CERQ was developed by Garnefski et al. (2001), and the short version used in this study was later developed by Garnefski and Kraaij (2006). They reduced the number of questions asked per emotion regulation strategy from four to two. The short version of the CERQ consisted of eighteen items rated on a 5-point Likert scale, ranging from 1 *(almost) never* to 5 *(almost) always*. An example of an item was 'I think I have to accept that this has happened' [in Dutch: 'ik bedenk me dat ik moet aanvaarden dat mij dit is overkomen']. Cronbach's α's of the CERQ-short ranged from .67 to .81. That was somewhat lower than the reliabilities of the original CERQ, which ranged from .75 to .86 (Garnefski & Kraaij, 2006). The Cronbach's α is this sample was .70. When the items about adaptive and maladaptive strategies were taken separately, the α's were .75 and .63, respectively. Validity of the CERQ-short was supported in the study by Garnefski and Kraaij (2006), but they pointed out that the original version of the CERQ had a higher validity. This was probably due to the reduction of items.

Third, the 10-item Social Interaction Anxiety Scale (SIAS-10), developed by Kupper and Denollet (2012), was used to measure levels of social interaction anxiety. They abbreviated the original SIAS, developed by Mattick and Clarke (1998). The ten items of the short version were rated on a 5-point Likert scale, ranging from 0 *not at all* to 4 *extremely*. An example of an item was 'I worry about not knowing what to say in social situations' [in Dutch: 'ik merk dat ik me zorgen maak dat ik niet zal weten wat ik moet zeggen in sociale situaties']. The abbreviation of the items from nineteen in the original version to ten in the

SIAS-10 led to an increasing of Cronbach's α from .90 to .92. The validity of the SIAS-10 was excellent (Kupper & Denollet, 2012). Cronbach's α in the present sample was .88.

Finally, the PHQ-9 (Patient Health Questionnaire-9), developed by Kroenke, Spitzer, and Williams (2001), was used to measure presence and severity of depression. The nine items were rated on a 4-point Likert scale, ranging from 0 *not at all* to 3 *nearly every day*. An example of an item was 'over the last two weeks, I had little interest or pleasure in doing things' [in Dutch: 'gedurende de afgelopen twee weken had ik weinig interesse of plezier in mijn gewone activiteiten']. Kroenke et al. (2001) found a strong criterion, construct, and external validity for this questionnaire. They found a Cronbach's α of .89, which indicated a high internal reliability. Cronbach's α in the present sample was .82.

Statistical analysis

Before conducting any analyses, the scores on the CERQ-short were computed into two total scores: one for adaptive strategies and one for maladaptive strategies (Table A1 in Appendix A shows which strategies are maladaptive and which ones are adaptive). These two scores were used separately in the analyses. This means that, to investigate the association between levels of self-control and different emotion regulation strategies, the levels of self-control were tested against the scores on both total scores separately. This was also done in the analyses to compare the emotion regulation strategies and the level of social interaction anxiety.

Assumptions. The following assumptions were checked before carrying out the analyses: linear relationship between the variables, normal distributions, multicollinearity, and homoscedasticity. In order to test these assumptions, use was made of scatterplots (linear relationships, multicollinearity, and homoscedasticity), histograms (normal distributions), tolerance and VIF values, correlations, and Mahalanobis distances (multicollinearity).

Baseline characteristics. Prior to the testing of the hypotheses, baseline differences in participants' characteristics were examined. For each variable (self-control, maladaptive strategies, adaptive strategies, and social interaction anxiety), the participants were assigned to a high score or low score group, using median splits. If participants were exactly at the median, they were included in the low score group. For each variable, chi-square tests were conducted to compare the differences between the high score and low score groups regarding relationship status, sex, and whether the subjects were under current psychological treatment.

A t-test was conducted to compare the differences between the high score and low score groups regarding depression scores. To divide the high and low groups of depression scores, a cut-off score of ten was used (Kroenke et al., 2001). If the differences between the groups of a certain variable were significant, the characteristic concerned would be used as a covariate when carrying out an analysis using that variable. These characteristics were chosen because it was felt they were the most likely to differ in this sample of students.

Analyses. To test the first hypothesis - low self-control relates to a higher use of maladaptive emotion regulation strategies and a lower use of adaptive strategies - two Pearson regressions were conducted. The first regression had self-control as the independent variable and maladaptive strategies as the dependent variable. The second had self-control as the independent variable and adaptive strategies as the dependent variable. Covariates, provided that they were significant in the baseline characteristics, were added to the analyses in an adjusted model, resulting in multiple regressions.

To test the second hypothesis - the use of more maladaptive and less adaptive emotion regulation strategies relates to higher social anxiety - two analyses were carried out. To test the relationship between maladaptive strategies and social interaction anxiety, a Pearson regression was used, with maladaptive strategies as the independent variable and social interaction anxiety as the dependent variable. To test the relationship between adaptive strategies and social interaction anxiety, another Pearson regression was used, with adaptive strategies as the independent variable and social interaction anxiety as the dependent variable. Covariates, provided that they were significant in the baseline characteristics, were added to the analyses in an adjusted model, making the analyses multiple regressions.

The third hypothesis - low levels of self-control are related to higher scores on social interaction anxiety - was tested by conducting a Pearson regression with self-control as the independent variable and social interaction anxiety as the dependent variable. Covariates, provided that they were significant in the baseline characteristics, were added to the analysis in an adjusted model, resulting in a multiple regression.

Results

Assumptions

A few assumptions were violated. The linear relationships were questionable for all variables. The distribution of scores on the SIAS-10 was not normal, but right-skewed. This means there were almost no high scores on social interaction anxiety. The other assumptions

were not violated. All the analyses were conducted as described in the method section, despite the violations.

Baseline characteristics

The results of the chi-square tests and t-tests to examine baseline differences in participant characteristics between participants with high and low scores on each variable are displayed in Table B1 through B4 in Appendix B. None of the p-values of the chi-square tests was significant at a .05 level, and therefore none of these variables was used as a covariate in the other analyses. With the t-tests, two p-values were significant: the depression scores between the groups high and low maladaptive strategies (M = 6.81, SD = 4.68 and M = 4.98, SD = 3.96, respectively) and high and low social interaction anxiety (M = 6.67, SD = 4.80 and M = 5.05, SD = 3.83, respectively) differed significantly (t (191) = -3.020, p = .003, two-tailed and t (193) = -2.687, p = .008, two-tailed, respectively). Therefore, depression scores were used as a covariate for testing the second hypothesis of the relationship between maladaptive strategies and social interaction anxiety. The covariate was also included in the testing of the relationship between adaptive strategies and social interaction anxiety, to make sure both analyses within hypothesis two were conducted the same way. Both maladaptive strategies and social interaction anxiety relate positively to depression, as can be derived from the means of the various groups.

Analyses

Table C1 in Appendix C shows the simple regressions carried out to test hypothesis one. The regression with adaptive strategies as the dependent variable showed a significant association with self-control, R^2 = .115, p = .039, 95% CI [.006, .224]. Adaptive strategies are positively related to self-control (B = .115). Maladaptive strategies were not significantly related to self-control (R^2 = .004, p = .425, 95% CI [-.145, .061]).

Table C2a, C2b, and C2c in Appendix C show the results of testing hypothesis two. Firstly, the multiple regression with maladaptive strategies as the independent variable (Table C2a) shows a significant relationship between maladaptive strategies and social interaction anxiety (R^2 = .069, p = .000, 95% CI [.145, .441]). In the adjusted model, the influence of maladaptive strategies is less clear, but still significant (R^2 = .040, p = .003, 95% CI [.082, .390]). In both models, maladaptive strategies relate positively to social interaction anxiety (B = .293 and B = .236, respectively). In the adjusted model, depression also showed a significant positive relationship with social interaction anxiety (R^2 = .023, p = .023, 95% CI

[.030, .393]). The R^2 of the adjusted model was .092. Secondly, the multiple regression with adaptive strategies as the independent variable (Table C2b) shows a significant relationship between adaptive strategies and social interaction anxiety (R^2 = .027, p = .017, 95% CI [-.306, -.030]). This relationship was negative (B = -.168). In the adjusted model, the effect of adaptive strategies was still significant (R^2 = .018, p = .045, 95% CI [-.276, -.003]). The relationship between depression and social interaction anxiety, however, was greater (R^2 = .043, p = .002, 95% CI [.100, .452]). Depression related to social interaction anxiety positively (B = .276). The R^2 of the adjusted model was .070. The model statistics for all models and adjusted models are displayed in Table C2c.

Table C3 in Appendix C shows the findings of the simple regression testing hypothesis three. Social interaction anxiety was not significantly related to self-control (R^2 = .008, p = .241, 95% CI [-.181, .046]).

Discussion

The aim of this study was to investigate the relationships between self-control, emotion regulation, and social interaction anxiety. The results show some significant effects. For the first hypothesis, it was found that self-control related significantly and positively to adaptive emotion regulation strategies. This part of the hypothesis was in accordance with the expectations. It suggests that a high level of self-control does help people to regulate their emotions in an effective way. The second half of the hypothesis shows that self-control does not relate significantly to maladaptive strategies. However, the effect that was found was in the expected direction: the nonsignificant relationship was negative. Although this part of the hypothesis has to be rejected, it might suggest that people who score low on self-control might be more prone to use maladaptive strategies. Overall, this hypothesis implies that high self-control is associated with more adaptive emotion regulation.

The second hypothesis produced more significant results. As expected, both maladaptive strategies and depression related significantly and positively to social interaction anxiety. This confirms the influence of maladaptive emotion regulation and depression on anxiety, also found by Campbell-Sills et al. (2006) and Tangey et al. (2004). This means maladaptive emotion regulation must be taken into account when assessing and treating people who struggle with anxiety. Furthermore, the results of hypothesis two show a significant negative relationship between adaptive emotion regulation strategies and social interaction anxiety. However, when depression was added in the adjusted model, the effect of adaptive strategies diminished, and the influence of depression became greater. The positive

effect of depression on social interaction anxiety in this part of the hypothesis was more clear, and contributed greatly to the explained variance of the model. This suggests that depression is more important in predicting social interaction anxiety than adaptive emotion strategies are. Maladaptive strategies and depression seem to be the most important predictors of social interaction anxiety. This again confirms the importance of maladaptive strategies when assessing and treating anxiety, and of the relationship anxiety and maladaptive strategies have with depression.

The third hypothesis did not provide significant results. Self-control was not significantly related to social interaction anxiety, nor was the nonsignificant effect in the expected direction. The found effect implied that self-control would be positively related to social interaction anxiety. This hypothesis has to be rejected, but nevertheless it can be interesting to look at the probable cause of this discrepancy between the found effect and the expectation. It may be that people with social interaction anxiety excessively try to make a good impression, be less anxious and avoid rejection (Kashdan, 2006; Vohs, Baumeister, & Ciarocco, 2005), which implies a high level of self-control. These attempts to prevent socially undesirable behaviour leads to a depletion of self-control. This depletion leads to undesirable social behaviour, which leads to more anxiety. This vicious circle described by Vohs et al. (2005) may explain why high self-control scores (in a nonsignificant manner) related to higher social interaction anxiety.

However, if self-control is positively related to adaptive emotion regulation strategies, and adaptive strategies are negatively related to social interaction anxiety, a contradiction rises. Perhaps adaptive strategies are a mediator in the relationship between self-control and social interaction anxiety. When people with high self-control use more adaptive strategies, they will score relatively lower on social interaction anxiety. When they use more maladaptive strategies (or less adaptive strategies), they will score relatively higher on social interaction anxiety. This would still be in line with the associations between anxiety and emotion regulation strategies shown by Amstadter (2008), Campbell-Sills et al. (2006), and Hofmann et al. (2009). However, it could also mean that the sort of strategies one uses does not arise from one's scores on self-control. As the results from hypothesis one show, high self-control relates positively to adaptive strategies, but Kashdan (2006) and Vohs et al. (2005) show that high self-control does not have to be beneficial. Perhaps it is best to have a moderate score on self-control. It would be interesting to test whether people with moderate scores on self-control show more clear positive relationships with adaptive strategies and low social interaction anxiety.

Finally, from the baseline characteristics and the multiple regressions to test hypothesis two it has become clear that people who score high on social interaction anxiety and maladaptive strategies also score higher on depression. Depression is significantly and positively related to social interaction anxiety. This was to be expected, considering the associations between depression and maladaptive strategies (Campbell-Sills et al., 2006). It implies that depression and anxiety are related, and both have ties with maladaptive emotion regulation. Once again, this shows the importance of maladaptive emotion regulation and depression when it comes to anxiety.

The few differences in outcomes between the current study and previous research could be explained by some limitations. The linearity of all variables was questionable, which may have led to less clear results than one would want to have. Furthermore, the distribution of scores on the SIAS-10 to measure social interaction anxiety was not a normal, but a right-skewed distribution. The scores ranged from 0 to 25, while the maximum score would be 40. Consequently, there were no high scores on social interaction anxiety to work with. To get more evident results, the distributions of scores on this variable should be normal. Third, the CERQ-short uses only two items per strategy to measure emotion regulation. Although the questionnaire is valid (Garnefski & Kraaij, 2006), the validity would have been higher when more items per strategy were used. The original CERQ has a higher validity than the questionnaire used in the present study (Garnefski & Kraaij, 2006), and could be a better choice for further research. Fourth, the distributions of males and females in the sample was not equal – there were 160 females and 49 males. Furthermore, the sample consisted of only first-year psychology students. Thus, this sample is not representative of the whole population.

However, the sample consisting of only psychology students can also be an advantage. It ensures that this study can be easily compared to many other studies, as other researchers often use psychology students too (Baumeister et al., 1998; Gailliot et al., 2007; Tice et al., 2007). In this view, the distribution of males and females may prove to be less of a problem as well. Other advantages are the clear associations this study shows between adaptive and maladaptive emotion strategies and social interaction anxiety. Although the associations regarding self-control should be made more distinct, this study makes a start relating all the benefits that rise from adequate self-control (Gailliot et al., 2007; Tangey et al., 2004) to emotion regulation strategies and social interaction anxiety. After the research on the relationships between two or three emotion regulation strategies and anxiety (Amstadter, 2008; Campbell-Sills et al., 2006; Hofmann et al., 2009), a step in the direction of research

with all emotion regulation strategies (Garnefski et al., 2001) and specific anxiety disorders (social interaction anxiety) has now been taken.

Future research could focus more on all the individual strategies as described by Garnefski et al. (2001). Individual strategies might all relate differently to self-control and social interaction anxiety. The importance of the use of particular strategies is shown in a study by Kashdan and Breen (2008), who found that people with low social interaction anxiety experienced more positive emotions if certain affect-regulatory strategies were present. Other distinctions in emotion regulation strategies would also be interesting to investigate, such as the antecedent-focused and response-focused strategies described by Gross (1998). With knowledge about all the emotion regulation strategies, treatments can become more specific and adjusted to the client's needs. People who struggle with regulating emotions will benefit from research on this topic.

Additionally, future research should aim to make the associations brought up in this study more distinct, so that they can be more helpful. This can be done by more carefully examining the relationships between self-control and emotion regulation, and between self-control and social interaction anxiety. This would work best when no assumptions are violated and the sample is more representative of the entire population. Future research could clarify whether high, low or moderate self-control is the most beneficial. Moreover, the role of depression in all these associations could be examined more profoundly, as for now it was only included as a covariate in two analyses. Depression can be expected to be an important factor, because of its connection to maladaptive emotion regulation (Campbell-Sills et al., 2006), its connection to low scores on self-control (Tangey et al., 2004), and its considerable effects in hypothesis two of the current study. In short, the relationships between self-control, emotion regulation strategies, social interaction anxiety, and depression should become even more distinct in future research.

Conclusion

In this study, the relationships between adaptive and maladaptive emotion regulation strategies and social interaction anxiety have become clear. Adaptive strategies relate to lower scores on social interaction anxiety. Maladaptive strategies relate to higher scores on social interaction anxiety. This means that emotion regulation is important in people who struggle with social interaction anxiety, and emotion regulation should be a part of the assessment and treatment these people receive. Especially maladaptive strategies seem to be important when predicting social interaction anxiety. Likewise, depression was positively related to social interaction anxiety. Self-control was positively related to adaptive emotion regulation, but the

relationships between the other aspects and self-control were less clear. More questions were derived from the relationships found, and a start was made with distinguishing the relationships between self-control, emotion regulation, and social interaction anxiety. These associations are of importance for providing assessment and treatment to people who struggle with any of these aspects. Hopefully future findings will be helpful.

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Appendix A

Emotion Regulation Strategies – Table A1

Table A1

Emotion regulation strategies

Strategy	Description	Adaptive / maladaptive
Self-blame	*Thoughts for putting the blame for what you have experienced on yourself*	Maladaptive
Other-blame	*Thoughts for putting the blame for what you have experienced on the environment or another person*	Maladaptive
Catastrophizing	*Thoughts of explicitly emphasizing the terror of what you have experienced*	Maladaptive
Rumination or focus on thought	*Thinking about the feelings and thoughts associated with the negative event*	Maladaptive
Putting into perspective	*Thoughts of brushing aside the seriousness of the event / emphasizing the relativity when comparing it to other events*	Adaptive
Positive refocusing	*Thinking about joyful and pleasant issues instead of thinking about the actual event*	Adaptive
Positive reappraisal	*Thoughts of creating a positive meaning to the event in terms of personal growth*	Adaptive
Acceptance	*Thoughts of accepting what you have experienced and resigning yourself to what has happened*	Adaptive
Refocus on planning	*Thinking about what steps to take and how to handle the negative event*	Adaptive

Appendix B

Baseline Characteristics – Tables B1 through B4

Table B1

Baseline characteristics for low and high scores on self-control

	Low self-control (*n* = 82)	**High self-control (*n* = 83)**	**Test statistic[a]**	***p***
Demographics				
Sex (female)	76.8% (63)	81.9% (68)	.381	.537
Relationship status (in a relationship)	37.8% (31)	44.6% (37)	.527	.468
Under treatment (no)	92.7% (76)	94.0% (78)	.000	.983
Depression *mean* (*SD*)	6.21 (4.19)	5.14 (4.16)	1.64	.104

Note.
[a]In case of χ^2: Including Yates' correction for continuity

Table B2

Baseline characteristics for low and high scores on maladaptive strategies

	Low maladaptive (*n* = 111)	**High maladaptive (*n* = 98)**	**Test statistic[a]**	***p***
Demographics				
Sex (female)	73.0% (81)	80.6% (79)	1.293	.255
Relationship status (in a relationship)	38.7% (43)	45.9% (45)	.826	.363
Under treatment (no)	93.7% (104)	92.9% (91)	.000	1.00
Depression *mean* (*SD*)	4.98 (3.96)	6.81 (4.68)	-3.02	**.003**

Note.
[a]In case of χ^2: Including Yates' correction for continuity

Table B3

Baseline characteristics for low and high scores on adaptive strategies

	Low adaptive (*n* = 114)	**High adaptive (*n* = 95)**	**Test statistic[a]**	***p***
Demographics				
Sex (female)	78.9% (90)	73.7% (70)	.533	.465
Relationship status (in a relationship)	44.7% (51)	38.9% (37)	.495	.482
Under treatment (no)	92.1% (105)	94.7% (90)	.230	.631
Depression *mean* (*SD*)	6.09 (4.42)	5.54 (4.38)	.901	.369

Note.
[a]In case of χ^2: Including Yates' correction for continuity

Table B4

Baseline characteristics for low and high scores on social interaction anxiety

	Low SIA (*n* = 107)	**High SIA (*n* = 102)**	**Test statistic[a]**	***p***
Demographics				
Sex (female)	75.7% (81)	77.5% (79)	.018	.892
Relationship status (in a relationship)	44.9% (48)	39.2% (40)	.471	.493
Under treatment (no)	92.5% (99)	94.1% (96)	.034	.854
Depression *mean* (*SD*)	5.05 (3.84)	6.67 (4.80)	-2.69	**.008**

Note.
Abbreviation: SIA = social interaction anxiety
[a]In case of χ^2: Including Yates' correction for continuity

Appendix C

Testing of the Hypotheses – Tables C1 through C3

Table C1

Hypothesis 1 - Simple regressions of the relation of self-control and emotion regulation

	B	***R^2***	**95% CI**	***p*[a]**
Self-control →				
Maladaptive	-.042	.004	-.145 - .061	.425
Adaptive	.115	.026	.006 - .224	**.039**

Note.
Abbreviations: CI = confidence interval, SIA = social interaction anxiety
[a]Significant at a .05 level

Table C2a

Hypothesis 2 – Multiple regression of the relation of maladaptive strategies, depression, and SIA

	B	***% R^2***	**95% CI**	***p* [a]**
Model				
Maladaptive	.293	.069	.145 - .441	**.000**
Adjusted model[b]				
Maladaptive	.236	.040	.082 - .390	**.003**
Depression	.212	.023	.030 - .393	**.023**

Note.
Abbreviations: CI = Confidence Interval, SIA = social interaction anxiety
[a]Significant at a .05 level
[b]Model adjusted for depression

Table C2b

Hypothesis 2 – Multiple regression of the relation of adaptive strategies, depression, and SIA

	B	***% R²***	**95% CI**	***p*[a]**
Model				
Adaptive	-.168	.027	-.306 - -.030	**.017**
Adjusted model[b]				
Adaptive	-.139	.018	-.276 - -.003	**.045**
Depression	.276	.043	.100 - .452	**.002**

Note.
Abbreviations: CI = Confidence Interval, SIA = social interaction anxiety
[a]Significant at a .05 level
[b]Model adjusted for depression

Table C2c

Hypothesis 2 – Model statistics of the multiple regressions of the relation of adaptive and maladaptive strategies, depression, and SIA

	R²	***F***	***df***	***p*[a]**
Models				
Maladaptive	.069	15.25	1, 207	**.000**
Adaptive	.027	5.77	1, 207	**.017**
Adjusted models[b]				
Maladaptive and depression	.092	10.42	2, 206	**.000**
Adaptive and depression	.070	7.78	2, 206	**.001**

Note.
Abbreviations: CI = Confidence Interval, SIA = social interaction anxiety
[a]Significant at a .05 level
[b]Models adjusted for depression

Table C3

Hypothesis 3 – Simple regression of the relation of self-control and social interaction anxiety

	B	***R²***	**95% CI**	***p*[a]**
Self-control →				
SIA	-.067	.008	-.181 - .046	.241

Note.
Abbreviations: CI = confidence interval, SIA = social interaction anxiety
[a]Significant at a .05 level