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Bias or reality? : negative perceptions of ambiguous social cues, social performance and physical arousal in socially anxious youth

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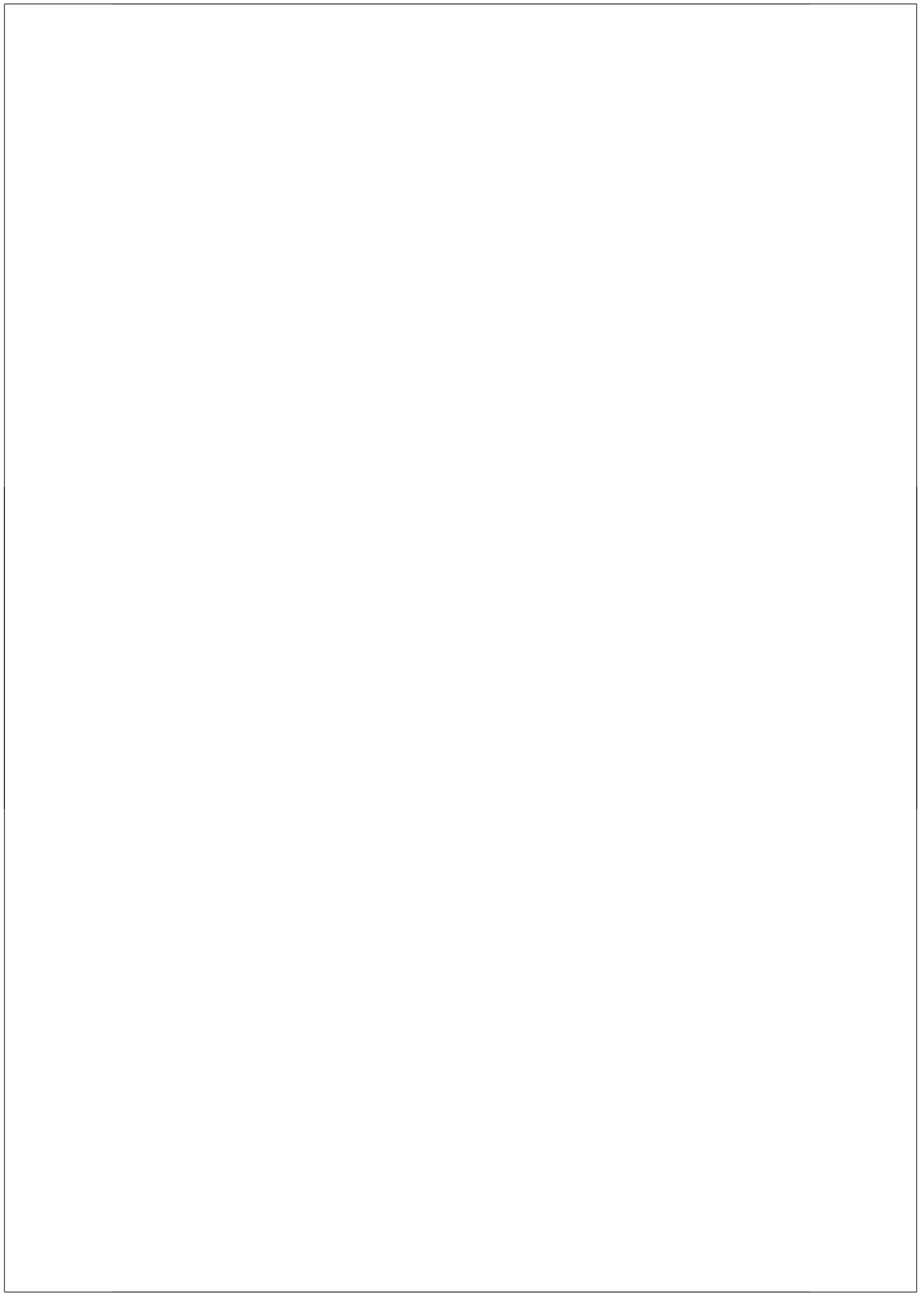
Chapter 6

General Discussion



The studies presented in this thesis addressed two main research questions that were prompted by prominent cognitive-behavioral models of social phobia, namely, the Clark and Wells (1995) model and the Rapee and Heimberg (1997) model. These two questions are:

1) Do socially anxious youth have negative perceptions in social situations? More specifically, do they interpret ambiguous situations in a negative way, have negative self-evaluations of their performance, and perceptions of intense physical arousal?
2) Based on sources of information other than socially anxious youth themselves, such as independent observers, fellow age peers, and actual physical responding, are the negative perceptions of socially anxious youth justified or are they biased?

In this final chapter, the findings presented in **Chapters 2 – 5** are summarized and integrated with reference to current literature and in the context of the two research questions. Furthermore, implications of our findings for the cognitive models and clinical practice are presented, followed by directions for future research.

Summary and Integration of Findings

In **Chapter 2** interpretation bias was measured with a questionnaire (Adolescents' Interpretation and Belief Questionnaire; AIBQ) requiring participants to indicate how likely it is that a particular interpretation for an ambiguous situation would pop up in their mind. Three different interpretations, a positive, a neutral and a negative one were rated separately and the participants also had to choose which of the three interpretations they believed to be the most correct. As expected, socially anxious adolescents rated negative interpretations of social situations as more likely to come to mind than adolescents with moderate social anxiety. The socially anxious group was also more likely to believe the negative interpretation for social situations as compared to the moderate social anxiety group. These anxiety group differences held after controlling for the level of negative affect, indicating that the negative interpretations

are not a consequence of a general negative affect factor associated with other emotional disorders, such as depression.

These findings are in line with a recent study (Vassilopoulos & Banerjee, 2008) that found a significant positive relationship between social anxiety level and the tendency to interpret negative social events in a catastrophic fashion in a sample of 11-13 year old children. This relationship held after controlling for children's level of depression. In the adult literature the tendency to interpret ambiguous social situations negatively has frequently been shown to be specific to social anxiety, rather than a feature of negative affect associated with anxiety and depression (Amir, Beard, & Bower, 2005; Constans, Penn, Ihen, & Hope, 1999; Huppert, Foa, Furr, Filip, & Mathews, 2003; Huppert, Pasupuleti, Foa, & Mathews, 2007; Voncken, Bögels, & Peeters, 2007). Hence, the pattern of findings presented in **Chapter 2** and in the study of Vassilopoulos and Banerjee (2008) for youth samples, converge with those from studies with adult samples.

The study in **Chapter 2** also found evidence for content-specificity of interpretation bias. The interpretation bias appeared to be specific for social situations. Thus, socially anxious adolescents were not more likely than their non-anxious peers to rate negative explanations of *non-social* situations as coming to mind, after statistically accounting for negative affect levels. Content specificity has been widely studied in adult populations and the findings suggest that the interpretation bias is indeed specific to social situations and does not extend to non-social situations (Amir et al., 2005; Constans et al., 1999; Huppert et al., 2003; Voncken, Bögels, & de Vries, 2003; Voncken et al., 2007; Wilson & Rapee, 2005).

An advantage of the AIBQ is that it separately assesses positive and negative interpretations. This is important because some studies have shown a lack of a positive bias in socially anxious individuals rather than the presence of a negative bias (e.g., Constans et al., 1999). Our findings showed that socially anxious adolescents are more likely to make negative interpretations of social situations but are not less likely to have positive interpretations of these situations. Similarly, Vassilopoulos and Banerjee (2008) found support for the presence of a negative bias rather than the absence of positive interpretations in their sample; however their measurement of interpretation bias was

slightly different. Children rated how likely a *neutral* explanation would come to mind in response to a mildly negative social event. Because of the nature of mildly negative events, positive interpretations would not be plausible; hence neutral interpretations are a suitable comparison to the positive explanations in the AIBQ. The weak and non-significant correlation between neutral interpretations of negative events and social anxiety reported by Vassilopoulos and Banerjee (2008) corroborates the findings of our study that socially anxious children do not lack benign interpretations of ambiguous social events.

In general, these findings paint a pretty dim picture of the way in which youth with high levels of social anxiety interpret ambiguous cues in social situations, particularly as social situations are generally full of ambiguities. This would make daily life quite distressing for socially anxious youth if they indeed perceive negative reasons for unclear behavior toward them. In the *interpretation bias* literature it is assumed that a bias is present when socially anxious persons' perceptions diverge from those of individuals with low to moderate social anxiety. However, this comparison does not really provide enough information to decide whether the negative perceptions are indeed biased or grounded in actual negative experiences in social situations. Socially anxious youth might perceive social cues in a negative manner simply because they are socially inadequate and, as a result, receive negative feedback from others. Hence, to determine whether or not their negative perceptions in relation to interpretation of ambiguous social situations are based on reality, actual social behavior and interpersonal relations should be measured (Vassilopoulos & Banerjee, 2008). In the following paragraphs, we describe two studies that did measure actual social behavior.

In the study presented in **Chapter 3,** social behavior of low and high socially anxious youth during a speech performance was judged by independent observers**.** We found that high socially anxious youth (children and adolescents) evaluated their performance in the Leiden Public Speaking Task (Leiden-PST; Westenberg et al., 2009) as significantly poorer than low socially anxious youth. However, we also found that, according to independent observers the high anxious youth did not appear more nervous, stutter more or show more physical signs of nervousness such as blushing. Thus, it seems that for nervousness, high anxious youth's negative perceptions were

unfounded and were not matched by the other information source: adult observers. This fits with current literature (e.g., Alden & Wallace, 1995; Cartwright-Hatton, Tschernitz, & Gomersall, 2005; Norton & Hope, 2001) and the cognitive models of social phobia in which concern about anxiety symptoms is prominent for socially anxious persons. Two possible explanations for the overestimation of nervousness are dealt with in relation to the results of **Chapter 5**, which are discussed below.

The findings in **Chapter 3** revealed a different pattern as regards the perception of social skills. Participants *and* independent observers were in agreement about the poorer social skills of high anxious youth. This suggested that the perceptions of the high socially anxious group were not biased. We then teased apart the good performing from the poor performing youth, as determined by independent observers. This showed that the negative self-perceptions were justified only for some socially anxious youth, namely the poor performers. Those high anxious youth who were judged as performing relatively poorly had reasonably accurate self-evaluations of social skills. However, the good performing high anxious youth evaluated their skills as poorly as the poor performers; hence their perceptions were unwarranted. This finding is in line with results from studies investigating the effectiveness of video feedback on self-evaluations (Morgan & Banerjee, 2006; Rodebaugh & Rapee, 2005). In these studies, video feedback improved the self-evaluations of only the skilled participants (Morgan & Banerjee, 2006) or the participants with larger underestimations of performance (Rodebaugh & Rapee, 2005). Hence, the findings are consistent with the notion that a bias in relation to self-evaluations of social skills exists for some, but not all, socially anxious individuals.

How can the similar self-evaluations in poor and good performers be explained? Are the poor performers aware of their poorer social skills and hence indicate this on the questionnaire whilst the good performers, for some reason, are unaware of their social skill abilities? Or perhaps both high anxious groups' evaluations are driven by their negative social experiences in real-life interactions with peers. **Chapter 4** gives some indication as to the likelihood of the latter explanation by paying attention to peer judgments of social skills.

In **Chapter 4** a group of adolescents, unfamiliar to the study's participants who gave a speech, acted as raters. A large number of adolescents viewed the recordings of

socially anxious and non-anxious adolescents' speech performances and rated four social skills: clarity of speech content, use of facial expressions, posture and body movement and way of speaking. The study reported large differences between high and low socially anxious speakers: unfamiliar peers evaluated high anxious speakers as giving a poorer speech in terms of content, facial expressions, posture, and way of speaking. Hence, in the context of peer relations high socially anxious youth's negative self-evaluations of social skills might in fact be justified and accurate. It is possible that, as a result of their inadequate social skills as perceived by peers, these peers react in a different, less pleasant manner towards them as compared with low anxious youth. This differential treatment is in turn noticed by the socially anxious youth, who may then come to expect negative outcomes from all types of social situations as a result of this repeated exposure to unpleasant social interactions. This brings us back to the *interpretation bias* investigated in **Chapter 2**. Perhaps this bias is underpinned by high anxious youth's exposure to negative outcomes from social relations with peers and should therefore be seen as warranted, rather than a distortion of reality.

Are peer-perceived social skills deficits of socially anxious youth the reason for previously observed negative treatment and disliking (Blöte, Kint, & Westenberg, 2007; Spence, Donovan, & Brechman-Toussaint, 1999; Verduin & Kendall, 2008)? The present thesis is unable to answer this question; however it is quite plausible that less adequate social skills are at least one aspect of high socially anxious youth's behavior that elicits negative responses from their peers (Verduin & Kendall, 2008). Schneider (2009) showed that the behavior of socially withdrawn 10-12 year olds in trusted close friendships is characterized by unassertiveness, passivity and uncommunicativeness. Whether it is a lack of specific skills or a general reticent nature that hinders the prolongation of successful peer relations, it is clear that the behavior of socially anxious youth makes this group a target for peer exclusion.

The study in **Chapter 5** investigated cognitive bias in a different domain, that of perceptions of physical arousal. It showed a divergence between perceptions of physical arousal on the one hand and actual physical arousal on the other in high socially anxious youth. The high anxious group perceived greater nervousness, higher heart rate, and sweatier palms during the Leiden-PST than the low anxious group. Yet this was not

matched by higher cortisol levels, a faster heart beat, or greater skin conductance in the high versus low anxious groups. The correspondence between subjective and objective measures of physical responding showed that in the less stressful pre-speech phase of the task, high anxious youth were better able to estimate their actual responding as compared to the more stressful speech phase. Furthermore, the results showed that self-monitoring of internal information was a better predictor of high anxious youth's perception of physical arousal than objective physical arousal measures, although this cognitive process could not satisfactorily account for high anxious youth's perception of physical arousal.

The findings in **Chapter 5** indicate that the overestimation of nervousness, as reported in **Chapter 3**, cannot be explained by greater physiological arousal in high versus low anxious youth (e.g., Inderbitzen-Nolan, Anderson, & Johnson, 2007) or by a greater tendency to focus on one's internal processes during a social situation (e.g., Anderson & Hope, 2009; Bögels & Mansell, 2004). Taking the findings of the two studies together, there seems to be quite strong support for a (not yet explained) nervousness bias in high socially anxious youth. According to high anxious youth they appeared more nervous and experienced greater physical reactivity (heart rate and sweaty palms) than their low anxious peers during the speech task, yet this was neither confirmed by independent observers nor by objective measures of physiological responding (heart rate, skin conductance and cortisol). Hence, socially anxious youth's perceptions of physical arousal seem out of line with objective sources.

The studies presented in this thesis suggest that nervousness/anxiety and social skills are two distinct elements of social performance (see also Hopko, McNeil, Zvolensky, & Eifert, 2001). **Chapters 3** and **5** presented evidence for a distorted perception of nervousness, and **Chapters 3** and **4** presented findings that lean towards a more nuanced picture as far as the accuracy of social skills perceptions is concerned. High anxious youth's preoccupation with nervousness seems out of place and our findings suggest that they should be more concerned about their social skills. This is supported by the study of Verduin and Kendall (2008) in which liking of socially anxious youth was independent of the extent to which they displayed observable anxious behavior, such as shaky hands. Furthermore, Blöte, Bokhorst, Miers, and Westenberg

(2009) found that nervousness did not, but social skills did predict social rejection of adolescents. It seems that nervousness is not really important to how adolescents are judged by age peers. In fact, trying to hide one's anxiety can have worse social consequences than simply acknowledging one's anxiousness during a social interaction (Voncken, Alden, & Bögels, 2006). Nevertheless, not all researchers employ this distinction between overt nervousness and social skills for social performance (e.g., Segrin & Kinney, 1995; Stopa & Clark, 1993; Voncken, Alden, Bögels, & Roelofs, 2008). It might be that these two aspects can be differentiated in children and adolescents but not in adults, or are more distinguishable in non-clinical as compared to clinical samples (Voncken & Bögels, 2008).

To sum up the findings with respect to the first research question, the studies in this thesis show that, during social situations, socially anxious youth do have negative perceptions in relation to, respectively, the interpretation of ambiguous situations, self-evaluation of performance, and perception of physical arousal. In terms of the second research question regarding whether these perceptions are biased or a reflection of reality, the studies suggest different answers for the three different perceptions. As far as self-evaluation of how nervous one is, or appears, the results are in support of biased processing of anxious arousal. This is evident from the overestimations of anxiety related symptoms and behaviors as compared to both independent observers' evaluations and objective measurement of physical arousal. For self-evaluations of social skills the findings indicate at least a partial justification for the low self-evaluations of socially anxious youth, as compared to adult observers; and a suggestion of wholly warranted low perceptions, as compared to peer observers.

Theoretical Implications

The findings presented in this thesis and from several other studies (e.g., Siegel, La Greca, & Harrison, 2009; Spence et al., 1999; Verduin & Kendall, 2008) suggest that the theories of Clark and Wells (1995) and Rapee and Heimberg (1997) could be expanded into development models whereby the role of peer relations and interactions on the development of children and adolescents' negative social perceptions is included. The theories do offer a starting point for this extension. For example, Clark and Wells

(1995) refer to "previous experience" interacting with innate behavioral predispositions as key to the development of social phobics' negative assumptions of the social world. Similarly, Rapee and Heimberg (1997) state that prior experience and feedback in a social situation is one source of information that is used to develop the mental representation of the self in social situations. The "experience" referred to in both models should incorporate social interactions with age peers, particularly in adolescence, as this period is associated with both an increase in the importance of peers to emotional development (La Greca & Prinstein, 1999), and fears for social-evaluative situations (Weems & Costa, 2005; Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004). It seems important for models to consider how feedback from peers impacts upon the child's perceptions of the social world and their idea of how others perceive their social behavior. In this vein, it would be important to investigate whether negative or unsuccessful peer interactions merely serve to confirm pre-existing beliefs about one's social inadequacy or if they actually play a greater role in shaping the child's perceptions, and consequently the likelihood of developing severe social anxiety.

A point on which the two leading cognitive models differ is the role of attentional processes in the maintenance of social fear (Schultz & Heimberg, 2008). Clark and Wells (1995) propose that upon entering a social situation attention is directed to the self, which prevents social phobics from perceiving information from the social environment that is inconsistent with their fear, and simultaneously enhances awareness of the feared anxiety responses. Rapee and Heimberg (1997) in contrast advocate that attentional resources are allocated both to aspects of the self and to potential external threat such as negative behaviors by audience members.

There are two reasons why the findings presented in this thesis are more in line with monitoring of both internal and external social cues as advocated by Rapee and Heimberg (1997). In **Chapter 5**, self-monitoring processes could not sufficiently explain the difference in subjective-objective arousal correspondence between high and low anxious youth, leaving open the possibility that perception of arousal is influenced by external cues of negative evaluation. And in **Chapter 4**, unfamiliar age peers readily perceived inadequacies in the social skills of high socially anxious adolescents. This finding and the work of others (e.g., Blöte et al., 2007; Siegel et al., 2009) suggests that,

contrary to Clark and Wells' (1995) theory, attention to the external environment would often confirm socially anxious youth's fear of negative responses from others. Although monitoring of external threat cues was not measured in the present thesis, it is very likely that socially anxious youth attend to information in the social environment, particularly from their age peers, and that this information plays a role in the formation of socially anxious youth's negative perceptions.

Clinical Implications

The studies presented in this thesis may also be used to inform treatment of youth with clinical levels of social anxiety. Before attempting to modify an interpretation bias it would seem important to first identify the quality of socially anxious youth's peer relations and possible reasons for peer rejection. It might be fruitless to modify the interpretation bias without increasing the chance that the socially anxious youth receives positive feedback from others. In the context of continuing poor peer relations it is unlikely that the interpretation bias could really be altered. Assertiveness training, targeted improvement of particular social skills or even attention to general appearance may all contribute to forming more constructive and positive social relationships.

As suggested in **Chapter 3** a "one size fits all" technique to correcting negative perceptions of social skills might not be appropriate. Socially anxious youth who perform poorly are not likely to benefit from video feedback or cognitive strategies to correct their negative perceptions. A behavioral component would be preferable for these individuals in order to improve their social skills, followed by the cognitive method if required. For those evaluated as good performers, video feedback could be a key component of treatment. In addition, **Chapter 4** advocates including the perceptions of age peers to inform the treatment of socially anxious youth's social skills. Improving social skills in a manner that elicits positive feedback from age peers, rather than adults, might be more effective at breaking the cycle of ineffective social interactions, expectations of negative social outcomes and fear of negative evaluation.

The other side of the social performance coin is anxiousness: the perception of one's physical symptoms associated with the anxiety (e.g., heart beating, sweatiness) and the visibility of one's anxious behaviors (e.g., stuttering, blushing). The findings in

Chapters 3 and **5** imply that all socially anxious youth would benefit from being made aware that their physical responses to a social-evaluative event are normal and are not more intense than the physical responses of their non-anxious peers. Indeed, a treatment component about the relevance of anxious arousal is often lacking in most programs (Anderson & Hope, 2009). Therapists could normalize socially anxious youth's perception of their arousal level and educate them about the meaning of anxious symptoms. For example, that an increase in heart rate simply indicates that the heart is working harder to provide enough energy to cope with the demands of the social task rather than a loss of control over the situation, or that one's chest is visibly thumping. Moreover, it would be important for the therapist to emphasize that visible nervousness does not detrimentally affect other people's impressions of social performance (Blöte et al., 2009; Verduin & Kendall, 2008; Voncken et al., 2006).

Directions for Future Research

In **Chapter 2** it is recommended that future research employ different methodologies to measure interpretation bias in order to corroborate and/or supplement what can be learned from self-report studies. For example, in studies with adult samples sentence completion tasks reveal intriguing differences in the nature of this bias and speak to the issue of the lack of positive versus presence of negative interpretations. To illustrate, Huppert et al. (2007) compared interpretation bias using a self-report test and sentence completion task. The sentence completion task allowed participants to generate as many responses to resolve an ambiguous sentence as they could think of and then choose the response that best completes the sentence. In the sentence completion test the high anxious individuals exhibited a lack of positive bias and the presence of a negative bias as compared to low anxious individuals. However, according to the self-report measure high anxious individuals were more negative but not less positive (Huppert et al., 2007). The authors suggest that "information processing in socially anxious individuals may shift from lack of positive bias (…) to lack of positive and presence of negative bias (…), and ultimately reside with an especially negative appraisal of the self" (Huppert et al., 2007; p. 1513). More information concerning the particular type of bias (absence of positive or presence of negative)

would help to inform and guide treatment and prevention of social anxiety disorder in youth. For example, if both types of bias exist, treatment could focus on increasing the tendency to positive responses, reducing the negative interpretations, or both.

The findings reported in this thesis highlight that studies investigating the different types of information processing biases, such as interpretation bias, social performance bias and arousal bias, should not consider the biases in isolation. For example, we have seen how socially anxious youth's negative interpretations of ambiguous social cues might be better understood through studies that investigate self- and observer-evaluations of social skills and nervousness. In a similar way, studies in the adult literature investigate the impact of interpretations of social situations on subsequent memory biases (e.g., Hertel, Brozovich, Joorman, & Gotlib, 2008). This may be a promising direction for future research because a memory bias may act as the bridge between biased interpretations of social events and subsequent negative perceptions of new situations.

For example, in Hertel et al. (2008) a group of generalized social phobics, and a control group without any disorder, were asked to provide continuations of ambiguous social and non-social situations, and subsequently to recall the continuations and the situations. These authors found that social phobic participants produced more negative and socially anxious continuations of social situations than the control group. More importantly, the social phobic group also produced more intrusions in their recall of social situations and these intrusions reflected the initial negative continuation (Hertel et al., 2008). It would be important to consider how interpretation bias in socially anxious youth may interact with memory processes and the extent to which a memory bias affects subsequent evaluations of social performance in novel situations. Thus, future research could examine whether socially anxious youth remember only selective information about a particular social event, as based on their negative or catastrophic interpretation of the event. The question then arises whether a memory bias would generalize to other, new social situations, coloring the youth's expectations of, and actual performance in, that situation. In this way, a memory bias for the negative aspects of a social event might perpetuate a cycle of expectation of negative evaluation and poor social experiences with peers.

Future studies on the perception of physical arousal in socially anxious youth could include other objective markers of arousal than heart rate, skin conductance, and cortisol measured in **Chapter 5**. A strong candidate for study is blushing. In a recent study, Vonken and Bögels (2009) found that social anxiety disorder patients who complain about blushing had a higher cheek temperature, higher blood flow and greater observer rated blushing during two social tasks than patients who did not complain about blushing. This suggests that for at least one physical symptom of anxiety a perception of greater arousal may be accurate for some socially anxious persons. A second candidate is salivary alpha-amylase. Van Veen et al. (2008) showed that adult patients with generalized social anxiety disorder differed from a control group in their diurnal salivary alpha-amylase levels, but not cortisol levels. Hence, it is possible that social anxiety group differences for physical arousal can be found in other markers of the stress system, such as cheek blood flow and/or temperature, or salivary alpha-amylase.

A fruitful direction for future research into information processing biases in socially anxious persons is the combination of low and high social evaluative conditions as employed in **Chapter 5**. Leber, Heidenreich, Stangier and Hofmann (2009) tested the hypothesis that high socially anxious individuals would process negative and specifically angry facial affect more quickly than a control group under high but not low social threat. Twenty five socially anxious participants and 24 non-anxious controls were asked to classify facial expressions conveying anger, sadness, fear, disgust, happiness and surprise. Half of the participants were subjected to a social threat induction whereby they received instructions that they would have to give a speech in front of someone after completing the computer (i.e., facial expression) tasks. These participants were told that their speech would be rated for effectiveness and that they would be told the topic of the speech only 30 seconds prior to the speech commencing. In accordance with the state by trait interaction hypothesis (MacLeod & Mathews, 1988), participants in the social anxiety group were faster than controls at classifying angry, sad and fearful faces only if they had received the social threat induction. High socially anxious participants not in the high stress condition did not differ from controls in speed of correctly classifying facial expressions. Thus, taking into account trait social anxiety

combined with high state anxiety can reveal important differences between high and low socially anxious groups.

Last but certainly not least, it is recommended that research into socially anxious youth's perceptions of social situations should be sure to include the perceptions of persons relevant to the anxious youth's daily social environment. Inherent to the social environment are parents and family members, and other influential adults such as a teacher or mentor. However, because of the nature of peer relationships and their increasing importance during the adolescent period (Brown, 2004; Hartup, 1996) it is crucial that age peers are included in research (Verduin & Kendall, 2008). How age peers perceive (this thesis **Chapter 4**), and react to (Blöte et al., 2007; Spence et al., 1999), socially anxious youth is very likely to be critical to understanding the youth's social context and their own perceptions of the social context. Indeed, evaluations from age peers are particularly relevant to the question of whether socially anxious youth's negative perceptions reflect reality or are biased.