Bias or reality? : negative perceptions of ambiguous social cues, social performance and physical arousal in socially anxious youth
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Chapter 1

General Introduction
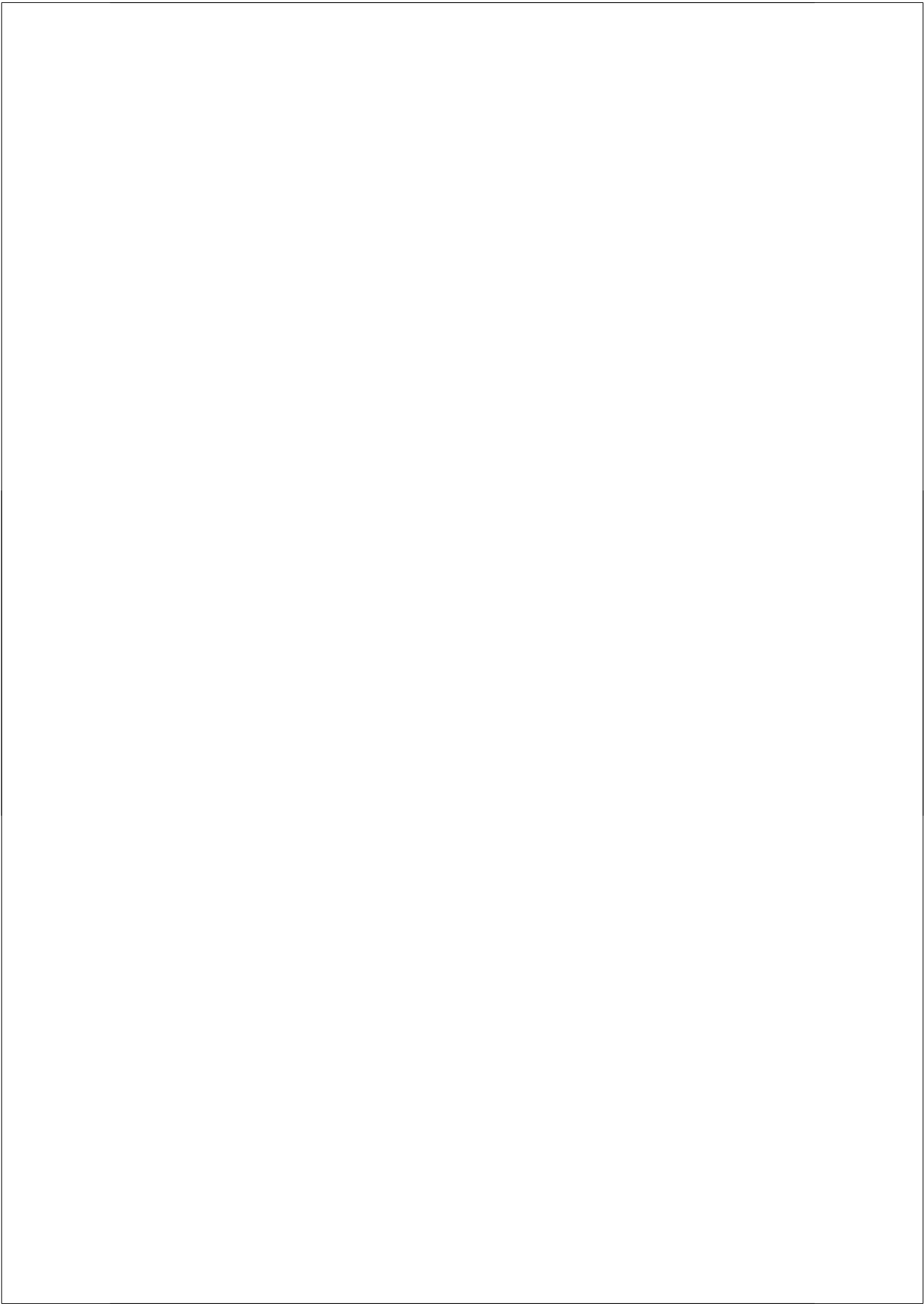
Most people experience apprehension, worry, or even fear about a particular social situation at some point in their lives. The reason for this concern might be that the social situation is completely new, there are very important people present, or the outcome of the situation will have a substantial impact on the person's life. We might think about a particular social situation, be it a public speech or a job interview, in a negative manner; think about making mistakes or behaving in a way that appears strange to other people. For example, tripping over or stuttering more than normal. We might worry about being rejected by others because of the way we behave. To experience this kind of anxiety in social and performance situations is a normal reaction and it can have an adaptive function in certain situations (Kearny, 2005). In other cases, however, the anxiety is extensive and may be a hindrance to a person's daily life. To account for these differences in the impact social anxiety can have on people's lives, social anxiety is conceptualized as being on a continuum (Rapee & Spence, 2004). A lack of social anxiety or only some worrying now and then lies at the lower end of the continuum and intense social fear and/or withdrawal from social situations at the upper end (Rapee & Spence, 2004). The present thesis is concerned with levels of social anxiety that lie toward the upper end of this continuum, whereby the individual frequently experiences intense fear about social situations and negative evaluation from others.

In a clinical context, Social Phobia (SP) or Social Anxiety Disorder (SAD) is defined as "a marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing" (American Psychiatric Association, 2000). For a person to receive a diagnosis of SAD the fears should cause significant interference or distress in the person's daily life (Rapee & Spence, 2004). Interference will occur if the social anxiety is so intense that the individual tries to avoid or escape from the feared social situations. For example, the individual may stop socializing with friends or even avoid going to work or school. In addition, for youth the anxiety must be present in situations with peers and not just adults and they must be able to show that they are capable of age-appropriate relationships with familiar people (APA, 2000). The prevalence of SP at a specific point in time (point prevalence) ranges between 0.45 –

15.6% in adult general populations (Furmark, 2002) and between 0.9 – 13.1% in children and adolescents (Gren-Landell et al., 2009). Epidemiological studies of adult (Furmark, 2002) and youth samples (Gren-Landell et al., 2009; Wittchen, Stein, & Kessler, 1999) show that a greater proportion of females than males meet criteria for SP. Similarly, on questionnaire measures female youth and adults alike report more social anxiety than their male peers (Kearney, 2005; Rapee & Spence, 2004). In contrast, the opposite gender difference is found in clinical populations, with higher rates of SP in males versus females; this is true for adult (see Rapee & Spence, 2004) and youth samples (e.g., Compton, Nelson, & March, 2000).

Research in the domain of social anxiety has addressed a number of important issues among which are the development of social anxiety, and its cognitive, interpersonal, and physical correlates. The studies in the present thesis focus on negative cognitions or thoughts that accompany high levels of social anxiety. In particular, the studies address the question of whether these negative cognitions are founded in reality. To give some perspective on how the present thesis fits within a wider context, this chapter will first describe its position in relation to the larger study on social anxiety of which it is part, and second how the studies here presented relate to a broader theoretical framework of cognition and social anxiety. General information regarding the study's procedure and participants is given at the end of this chapter.

The SAND Study

This thesis is part of a larger, longitudinal study on social anxiety in adolescence, called the Social Anxiety and Normal Development (SAND, www.sand-lu.nl) study. The SAND study was motivated in part by the paucity of studies investigating the developmental course of social anxiety during adolescence. Knowledge about social anxiety during this period is important because epidemiological and clinical studies indicate a teenage-bound increase in social anxiety disorder (Kashdan & Herbert, 2001; Ollendick, King, & Yule, 1994; Strauss & Last, 1993; Westenberg, Siebelink, Warmenhoven, & Treffers, 1999). Hence, adolescence seems to be a vulnerable period for developing dysfunctional levels of social anxiety. The SAND study sought to further our understanding of the factors that may contribute to or explain this vulnerability. To

achieve this, the study incorporated two main lines of research. One research line investigates features of normal development in adolescence (e.g., puberty and psychosocial maturation) and their relationship to social fears (see e.g., Sumter, Bokhorst, & Westenberg, 2009). The second research line focuses on how individuals with high levels of social anxiety differ from their non-anxious counterparts in various aspects of functioning, such as cognitive, emotional and peer relations. The present thesis fits within the second research line and specifically focuses on the cognitive functioning of high socially anxious older children and adolescents (henceforth termed youth) in comparison to youth with low to moderate levels of social anxiety.

Cognitive-Behavioral Models of Social Anxiety

Since the introduction of two cognitive-behavioral models of social anxiety in the 1990s (Clark & Wells, 1995; Rapee & Heimberg, 1997), a proliferation of studies have focused on the cognitive aspects of social anxiety as described in these models (Schultz & Heimberg, 2008). To illustrate, in September 2009, Rapee and Heimberg's (1997) article had been cited 399 times and the chapter by Clark and Wells (1995) 717 times in Google Scholar.

The cognitive-behavioral models describe what happens to an individual during, or in anticipation of, a socially threatening situation, in terms of cognitive, behavioral and physical processes (Clark & Wells, 1995; Rapee & Heimberg, 1997). Clark and Wells (1995) primarily focus on socially anxious individuals' beliefs about the danger inherent in social situations and the processes that prevent them from changing their beliefs and ultimately, reducing their social anxiety. The core feature of Rapee and Heimberg's (1997) model is the mental representation formed by the individual of his/her external appearance and behavior as seen by the audience. This mental representation is compared with the individual's perception of the audience's standard for evaluation. The extent to which the mental representation of performance does not meet the audience's perceived standards determines the likelihood of negative evaluation and experience of anxiety.

More important in the context of the research reported in this thesis is the way in which the cognitive models describe how socially anxious persons tend to engage in

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distorted processing of information related to a social-evaluative situation. Because socially anxious individuals are greatly concerned about the possibility of negative evaluation from others (Clark & Wells, 1995) and assume that other people are inherently critical (Rapee & Heimberg, 1997), they take a negative view of social situations and the accompanying behavioral, cognitive and somatic responses within themselves. In this thesis, the tendency toward a negative perspective is investigated in three different domains. These domains are (a) interpretation of ambiguous social situations, (b) self-evaluation of social skills and nervous behaviors, and (c) perception of physical arousal during social situations. This thesis also aims to ascertain the extent to which socially anxious persons' negative perspective is justified; this is addressed in the cognitive models but is not discussed extensively (Clark & Wells, 1995; Rapee & Heimberg, 1997). Do socially anxious individuals have good reason to be negative in their perceptions; or, are their perceptions distorted and do they show a negative bias in their thoughts?

In sum, the studies presented in the current thesis aim to address the following research questions, which are explored in socially anxious youth:

1) Is there evidence for negative perceptions in relation to interpretation of ambiguous social situations, self-evaluation of social performance, and perception of physical arousal during social situations?

2) Are the negative perceptions actually justified by sources of information other than socially anxious youth themselves, such as independent observers, fellow age peers and actual physical responding? Or are the negative perceptions of socially anxious youth really unwarranted as based on these other sources of information?

Negatively Biased Interpretations of Social Situations

Both cognitive models assume that socially anxious persons interpret social situations in a threatening way and that their interpretations are more negative than non-socially anxious persons' interpretations (Clark & Wells, 1995; Rapee & Heimberg, 1997). For example, imagine a person has just given a speech in front of a large audience and at the end of the speech nobody in the audience asks a question. How would the

speaker interpret this? For a person without strong socially anxious feelings the lack of questions is likely to be interpreted in a positive or neutral manner. For example, that the speech was very clear, or due to the speech taking place at the end of the day all audience members were too tired to ask a question. However, for a socially anxious person it is likely that the lack of questions would be interpreted as meaning that something was wrong with their speech; it was unclear, or difficult to follow. This tendency to place a negative meaning on an ambiguous social cue is called an *interpretation bias* (Heinrichs & Hofmann, 2001) and is the focus of the first study described in **Chapter 2**.

 In that study, the presence of an interpretation bias is tested in a non-clinical adolescent sample and a number of issues central to the study of this bias are investigated. One of these issues is whether the interpretation bias reflects a real propensity to favor negative explanations for ambiguous social situations over positive ones, or, whether it reflects a lack of positive explanations (Amir, Foa, & Coles, 1998; Constans, Penn, Ihen, & Hope, 1999; Huppert, Foa, Furr, Filip, & Mathews, 2003; Stopa & Clark, 2000). That is, are positive explanations absent or are they given less importance than negative interpretations in the minds of socially anxious adolescents? Another issue relates to the specificity of interpretation bias to social anxiety. Some research has shown that negative interpretations of social situations are also characteristic of individuals with depression (e.g., Franklin, Huppert, Langner, Leiberg, & Foa, 2005). Is interpretation bias particular to social anxiety or is it a feature of an underlying negative affect common to anxiety and depression?

Negatively Biased Self-Evaluations of Performance

 The cognitive models assume that socially anxious individuals evaluate their performance in social situations more negatively than persons without social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997). In addition, the authors also raise the question whether socially anxious persons' tendency to be more negative about their performance is warranted; do socially anxious persons really perform more poorly than their non-anxious counterparts in different social situations? Clark and Wells (1995) state that the negative performance thoughts are "partly distorted" (p. 81). Similarly,

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Rapee and Heimberg (1997) propose that the negative mental representation of socially anxious persons could be a result of "actual deficits", "distorted perceptions" or both (p. 745). Thus, these authors propose that although socially anxious persons are likely to overestimate how poor their performance is, there is still some degree of truth in their evaluations.

In the study described in **Chapter 3** social performance evaluations are investigated in a group of high socially anxious youth (versus low socially anxious youth), differentiating between two aspects of social performance, namely, social skills and overt nervousness. High and low socially anxious youth evaluated how well they performed during a short speech. The speeches were recorded and shown to independent observers who also evaluated the performances using the same questionnaire as participants. The study addresses how self-evaluations compare with observer evaluations. Do independent observers evaluate high anxious youth as less socially skilled and looking more nervous than low anxious youth? If observers agree with high anxious youth's poorer self-evaluations we cannot necessarily speak of a bias. In this case, high anxious youth's performance evaluations would be accurate. The study also considers the possibility that not all socially anxious individuals have a negative bias about their social performance. Two studies have shown that, according to independent observers, some socially anxious individuals perform well in social situations whilst others have a poorer social performance (Morgan & Banerjee, 2006; Rodebaugh & Rapee, 2005). This could mean that the negative self-evaluations of socially anxious individuals with a skilled performance are unjustified and biased whereas the self-evaluations of less skillful performers are accurate and unbiased. Although the cognitive models do not directly address this issue, it is of relevance to the effectiveness of different treatment approaches to social phobia, such as video feedback and social skills training.

Another interesting topic is where the negative self-evaluations come from. The cognitive models state that prior social experience influences the socially anxious person's beliefs about the social world (Clark & Wells, 1995) or their mental representation in a social situation (Rapee & Heimberg, 1997). Hence, it is very likely that the negative self-evaluations of socially anxious youth reflect unsuccessful social

interactions with peers. A number of studies using a range of methodologies, including observations in the school environment (Blöte, Kint, & Westenberg, 2007; Spence, Donovan, & Brechman-Toussaint, 1999), sociometric nomination (Gazelle & Ladd, 2003; Greco & Morris, 2005) and peer liking conducted in the laboratory (Verduin & Kendall, 2008) clearly show that socially anxious youth receive negative feedback, are disliked and neglected by their peer group. Hence, the literature to date suggests that socially anxious youth have good reason to think about their social performance in a negative way.

The study described in **Chapter 4** explores whether unfamiliar same age peers perceive the social skills of socially anxious youth as poorer than the skills of their non-anxious counterparts. Using same age peers as observers of social skills instead of adults is considered important because peers might be more sensitive to slight digressions in the behavior of other youth. Furthermore, peer relations take on increasing dominance and importance in the adolescent period (e.g., Hartup, 1996; Brown, 2004) suggesting that evaluations from peers might be more relevant to the child's developing awareness of social self-worth. If socially anxious youth are perceived as lacking in social skills this might be a reason for their poor treatment, and in turn, their negative self-evaluations.

Perception of Physical Arousal

Socially anxious individuals are said to distort and exaggerate their somatic responses. Clark and Wells' (1995) model states that during social situations somatic changes occur and that these changes are interpreted as evidence of danger and anxiety. For example, an increased heart rate is perceived as losing control. For Rapee and Heimberg (1997) information from the autonomic nervous system feeds into the mental representation and this may be depicted as visible, for example a slight warm feeling in the cheeks would be represented as obvious blushing (Voncken & Bögels, 2009). Because physical symptoms of arousal are seen as key candidates for negative evaluation (e.g., sweating, heart pounding) the socially anxious person will overestimate these symptoms. Hence, the cognitive models assume that socially anxious persons also perceive their arousal in perhaps a rather negative manner, and exaggerate the degree to which they actually experience physiological symptoms.

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In the study presented in **Chapter 5**, socially anxious and non-socially anxious youth are compared in terms of their subjective and objective (actual) arousal during a social-evaluative situation. Several studies indicate that socially anxious persons' perception of arousal during a highly stressful task does not match their actual symptoms, that is, subjective and objective arousal do not correspond (e.g., Anderson & Hope, 2009; Mauss, Wilhelm, & Gross, 2004). Hence, by comparing subjective with objective measures of arousal these studies explore whether socially anxious individuals over-represent their anxious symptoms under highly stressful conditions, or, whether their perceptions are supported by real increases in physical responding compared to non-anxious individuals. **Chapter 5** also takes this approach and, in addition, our study (a) considers whether socially anxious youth's perception of arousal matches their actual physical responses more closely during a less stressful phase of the social task; and (b) examines the extent to which self-monitoring of internal processes can explain socially anxious youth's perception of physical arousal.

SAND Study General Procedure

As previously stated, the studies presented in this thesis are part of the larger SAND study. The SAND study's research design combines the cross-sectional with the longitudinal method (i.e., cohort-sequential design with three testing moments); the present thesis reports only from the cross-sectional data collected at the first testing moment (T1). Relevant to the present thesis are the T1 Pre-Lab session and Lab-session. Both sessions took place at Leiden University. In the Pre-Lab session participants completed a battery of assessments including questionnaires on a pc, tests to assess cognitive capacities, a pictorial test measuring pubertal development and a sentence completion test to measure psychosocial development. The Pre-Lab session lasted maximally 3 hours for secondary school pupils and 2 hours for primary school pupils (assessments and/or questionnaires that were too difficult for primary school pupils were removed).

One week after the Pre-Lab session participants returned to the University for the Public Speaking Task lab session (the Leiden-PST; Westenberg et al., 2009). A new public speaking procedure was developed especially for the SAND study. The purpose

was to develop a standardized and natural speech task that constitutes a social-evaluative threat and is suitable for youth. The Leiden-PST has two main features that distinguish it from other public speaking task protocols. First, participants are given the opportunity and are encouraged to prepare for the speech beforehand instead of being informed about the task just before it begins (e.g., Inderbitzen-Nolan, Anderson, & Johnson, 2007). Allowing for sufficient preparation time was motivated by three reasons: (a) it more closely mirrors a real-life situation for youth such as an oral report at school; (b) it differentiates between participants who show a strong response during anticipation of the task and those who react more strongly during the task itself; and (c) it more clearly measures social-evaluative anxiety rather than other negative emotions triggered by the unprepared and surprising elements of impromptu tasks.

The second feature of the Leiden-PST is the use of a pre-recorded audience. An audience is of particular importance to creating a social-evaluative threat, however using a live audience was not only impractical in the context of such a large study but also would not be standard across participants. The pre-recorded audience consisted of age peers and a teacher. Audience members were encouraged to act in a natural manner while avoiding overt positive or negative behaviors. To make the speech task like an oral presentation at school the audience was filmed in a classroom and projected life-size during the speech. To enhance the credibility of the speech task participants were explicitly told that the audience was recorded. The effectiveness of the pre-recorded audience was demonstrated in Westenberg et al. (2009); the strongest physiological arousal (heart rate and skin conductance) during the Leiden-PST was elicited the moment the audience entered the classroom. Details regarding the specific procedures followed during the Leiden-PST are described in **Chapters 3** and **5**.

Selection of SAND Study Participants

Participants in the SAND study are pupils from one secondary school and two primary schools. Pupils who received medication or were undergoing psychological treatment for a serious medical or psychological illness, those with insufficient Dutch language proficiency or severe dyslexia were excluded from the study. However, if a participant's status changed during the course of the study, the participant was retained.

Initially, all secondary school pupils from one local school in Grades seven to ten (N = 632) were tested in a classroom assessment. Pupils in the vocational stream were not included because the study's main procedure (a public speaking task) was not considered relevant for this educational level. From this group 204 adolescents were selected to reflect a representative range of social anxiety scores, with an approximately equal age and sex distribution. In order to yield a large enough group of high socially anxious adolescents, 38 additional pupils with scores in the top 20% on the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998), according to their gender distribution, were selected. Again, these high anxious pupils were selected in such a way as to try to ensure a relatively even spread across age groups and gender. Of the 242 selected secondary school adolescents, 205 took part, 32 of whom were from the over-sampled high anxiety group. Reasons for not participating included parental refusal and lack of time due to employment, sport activities or other commitments.

In addition, 126 pupils from two local primary schools attending Grades four to six took part. Due to practical reasons primary school pupils could not be selected in the same way as secondary school pupils. Instead, all pupils in Grades 4-6, who agreed to participate and for whom parental consent was received, formed the primary school sample. The primary school sample included approximately equal numbers of pupils from each grade and approximately equal numbers of boys and girls within each grade.

Hence, in total 331 primary and secondary school pupils took part in the SAND study, but four secondary school pupils did not complete the second session. This left 327 participants in the age range of 8 – 17 years, with 167 boys and 160 girls.

In the studies presented in **Chapters 2 – 5** a group of youth with high self-reported levels of social anxiety, as measured by the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998) is compared to a group with low to moderate scores on the SAS-A. In **Chapter 2**, participants were not selected from the SAND study sample but from a sample of adolescents collected in the preparatory phase of the SAND study. **Chapters 3**, **4** and **5** use participants selected from the SAND study sample, however in **Chapter 4** only secondary school pupils were included. The samples used in **Chapters 3** and **5** are identical.