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## **Growing up to be fearful? Social evaluative fears during adolescence**

Sumter, S.R.

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Growing up to be Fearful?  
Social Evaluative Fears during Adolescence

Sindy Resita Sumter

[Faint, illegible text]

Growing up to be Fearful?  
Social Evaluative Fears during Adolescence

PROEFSCHRIFT

Ter verkrijging van de graad van Doctor aan de Universiteit Leiden,  
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Co-promotor Dr. C. L. Bokhorst (Universiteit Leiden)

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Prof. Dr. W. Vollebergh (Universiteit Utrecht)  
Prof. Dr. C. Weems (University of New Orleans)

*Two roads diverged in a yellow wood,  
And sorry I could not travel both  
And be one traveler, long I stood  
And looked down one as far as I could  
To where it bent in the undergrowth.*

*Then took the other, as just as fair,  
And having perhaps the better claim,  
Because it was grassy and wanted wear;  
Though as for that the passing there  
Had worn them really about the same.*

*And both that morning equally lay  
In leaves no step had trodden black.  
Oh, I kept the first for another day!  
Yet knowing how way leads on to way,  
I doubted if I should ever come back.*

*I shall be telling this with a sigh  
Somewhere ages and ages hence:  
Two roads diverged in a wood, and I--  
I took the one less traveled by,  
And that has made all the difference.*

*Robert Frost, The Road Not Taken (1915)*

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## CHAPTER 1.

## General Introduction

### Social Anxiety during Adolescence

Social anxiety disorder (SAD), or social phobia, is one of the three most common psychological problems in adolescence (Ollendick & Hirshfeld-Becker, 2002). Prevalence rates for SAD range between 7% and 13% (Furmark, 2002). Several retrospective studies have pinpointed the onset of social anxiety during adolescence (Rapee & Spence, 2004). For instance, Otto et al. (2001) reported an average age of onset of 10-11 years, and 15 years if they had not reported any other childhood anxiety disorder. Rarely has age of onset been reported during early childhood or after late adolescence, e.g. 80% of participants in the Otto et al. study reported an age of onset before 18 years. In addition, evidence for an increase of social phobia prevalence rates during the adolescent period has been reported as well. For example Essau, Conradt, and Petermann (1999) found prevalence rates that started at 0.5% among 12-13 years olds to 2% among 14-17 year olds. Similar results were reported by Wittchen, Stein, and Kessler (1999), although their prevalence rates were somewhat higher overall. In the Wittchen et al. study social phobia prevalence rates increased into late adolescence and young adulthood, this is 4.0% among the 14-17 year olds and 8.7% among the 18-24 year olds.

It has been proposed that a normative increase in social fears underlies the rise in clinical social anxiety disorder during adolescence (e.g., Miller, Boyer, & Rodoletz, 1990; Wenar, 1990; Westenberg, Siebelink, & Treffers, 2001). Several studies have investigated the developmental pattern of social fear in non-

clinical samples, but the findings have been mixed. Some studies have found support for a high salience of social fears during adolescence. Essau, Conradt, and Petermann (1999) studied social fears in a community study of adolescents between the age of 12 and 17 years ( $N = 1035$ ). Almost half of the sample reported experiencing social fears (47.2%) and a temporary increase in social fears was observed as well, with the highest number of fears being reported by the 14-15 year olds.

Other studies reported that levels of social fear were stable (e.g., Gullone, King, & Ollendick, 2001) or even diminished during this time period (e.g., Gullone & Lane, 2002). However, Weems and Costa (2005) showed that if social fears are compared with other fears, social fears are most pronounced during adolescence. Thus, studies might not show age differences in absolute levels of social fears, but if these fears are contrasted with other fears age differences do become apparent.

However, based on existing literature Rapee and Spence concluded in their 2004 review that "Contrary to folklore, several studies have indicated little change or even a slight decrease in social anxiety and self-consciousness from late childhood to early adolescence" (Rapee & Spence, p. 741). This review focused on the etiology of social anxiety. The risk and protective factors they discussed included, genetics, temperament, parental influences, and traumatic experiences. Notably, they discuss age of onset and prevalence rates of social anxiety and phobia, while no attention was paid to possible developmental variables that could contribute to the experience of social fears. Instead, they argue that the adolescent bound onset of social phobia is due to increased life interference of this fear. This implies that adolescents do not experience more distress during social situations, but rather that distress becomes a larger problem. As adolescents encounter more social situations and their peer interactions are more important to them, similar levels of distress might be experienced as more problematic and trigger maladaptive behaviors, such as avoidance, on a larger scale.

Because, up to now the findings on the developmental pattern of social fears have been mixed and large longitudinal studies that specifically focus on the development of social fears are absent, it remains unclear whether there is an adolescent-bound increase. Hence, the main aim of the current thesis

was to investigate whether an adolescent-bound increase in social fears can be observed.

### Why would adolescence be a period of increased sensitivity to social situations?: etiology of social fears

An increase of social fears during adolescence can be understood in light of the many changes that occur during this phase in life. There are several developmental variables and models that could help explain why age of onset of social fears is placed at adolescence and why adolescents experience negative emotions in relation to social situations, in particular with reference to peer interactions. Discussed below are the possible role of cognitive development, pubertal development, and psychosocial development. These developmental changes that occur within individuals in combination with the changing social context might result in a vulnerability to social fears. To provide a general impression of the framework in which the current work was carried out, Figure 1 outlines the assumed relationships between the central variables in the present thesis.

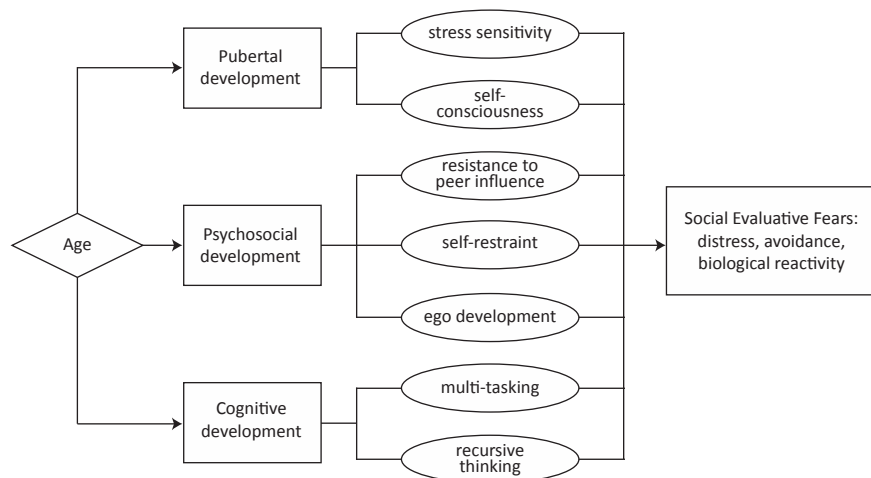


Figure 1. Developmental variables that might contribute to the emergence of social fears during adolescence.

### **Cognitive Development**

Although cognitive development takes immense leaps during childhood, progress during adolescence is substantial as well. From the early studies of Piaget (1972) who reported that formal operational reasoning emerges at age 12 to 15 years, the increased ability in abstract reasoning has received much attention (Hatcher, Hatcher, Berlin, Okla, & Richards, 1990). Another topic that has been linked to adolescence is the emergence of advanced perspective taking skills (e.g., Selman, 1980; Miller, Kessel, & Flavell, 1970). Recent findings from brain studies have contributed to the renewed interest in cognitive development during adolescence and provided neural evidence for behavioral data already collected (e.g., Paus, 2005; Giedd et al., 1999). These studies have also brought about increased attention for changes in social cognition during adolescence. The frontal lobe areas that are said to mature into late adolescence carry special importance for social cognitive development (Paus, 2005).

Several of these developmental changes might be crucial to experiencing social fears, especially social evaluative fears which are driven by anticipated evaluations. For example, in a study among 3 to 14 year olds, Muris, Merckelbach, Meesters, and Van den Brand (2002) showed that with increasing age and cognitive development children were able to elaborate on their worries. Adolescents' advanced cognitive abilities allow them to reflect on upcoming events, which would contribute to more worry in the run up to social situations. Rosso, Young, Femia, and Yurgelun-Todd studied frontal lobe functioning in a small sample of 9 to 18 year olds (N = 20). In addition to an age related increase in abstract reasoning and set shifting into late adolescence, they also reported a direct link between increased abstract reasoning and social anxiety. However, it needs to be mentioned that the effect was small and the sample size limited. Thus, future studies are needed to investigate the relationship between social fears and increased abstract reasoning.

Two aspects that might be especially relevant to experiencing social fear are recursive thinking and multitasking. Recursive thinking might best be viewed as a prerequisite for experiencing social fears. To experience social fear it is necessary to be aware that others might think about and judge you. Recursive thinking enables the adolescent to play into the wishes of their audience,

but it might also pave the way for insecurities and other vulnerabilities or less adaptive outcomes. For example, Veith (1980) found that increased recursive thinking was related to self-image. The difference between children's ideas about their actual selves and ideal selves increased. This growing discordance between possible selves could contribute to the emergence of insecurities.

Furthermore, social situations, including public speaking, require several skills to be handled successfully. During a public performance you need to: 1) remember what you were going to say, 2) pay attention to the time, 3) be aware of how the audience is judging your presentation and yourself. To think of all these things simultaneously would probably require additional mental capacity. During adolescence working memory increases (Gathercole, Pickering, Ambridge, & Wearing, 2004) and enables the ability to multitask, which might allow children to reflect on all these aspects. As a result, multitasking would enable adolescents to not only better their performance, but it would at the same time leave the necessary mental capacity to be aware of the fact that they are evaluated during their performance.

#### **Pubertal Development**

For decades early adolescence has been characterized by a greater awareness and sensitivity to the evaluation by others. Puberty has been invoked by several theorists as the causal explanation for this change. Elkind and Bowen (1979) argued that the onset of puberty brings about an increase in self-consciousness. More specifically, others state that the heightened preoccupation with their own bodies, which undergo dramatic changes at puberty, might contribute to increasing feelings of self-awareness (Buss, 1980). In line with these suggestions, Thompson and Goodvin (2005) state that "The burgeoning capacities for abstract thought, together with the social circumstances of adolescence and the psychobiological changes associated with puberty, can foster significant changes in self-understanding, self-evaluation, and the social self" (p. 418). Although increases in self-consciousness and greater awareness of evaluation by others, which creates a platform for developing social fears, have been linked to pubertal development, experimental evidence for this relationship is limited. Some have found evidence for an increase of social fears in early adolescence (e.g., Weems & Costa, 2005) which would suggest that the

changes might be linked with the onset of puberty. However, other studies have reported the rise in social fears to occur during mid-adolescence (Westenberg et al., 2004) which makes it less likely that puberty would be the causal factor in the etiology of social anxiety. Due to these inconsistent age findings, it becomes difficult to deduce clear expectations about puberty's role. The direct relationship between puberty and social anxiety has in fact gone largely unexplored.

In short, the onset of puberty has been viewed as the instigator of a variety of emotional disorders (Dahl, 2004). Although some data is available that support the idea that puberty triggers a period of increased emotional disorders, there are still no studies available that have carefully investigated the relationship between pubertal development and social anxiety.

### **Psychosocial Development**

Adolescence is also a time of psychosocial development. There are several models of psychosocial development, but thus far few have been studied in relation to social fears. For example, Cauffman and Steinberg (2000) presented a multifaceted model of psychosocial maturity. Some central elements of this model are perspective taking (e.g., consideration of others), personal responsibility (e.g., resistance to peer influence and autonomy), and temperance (e.g., impulse control). Although this model has been mainly applied to understanding externalizing and risk behavior in youth, parts of this model can also better our understanding of social fear. For instance, resistance to peer influence is thought to show a temporary decline during adolescence. This decline is said to contribute to increased risk behavior. However, not being able to resist peer influence indicates that youth are particularly vulnerable to peer approval. Social situations could, if you do very poorly, damage your peer status, which would explain why adolescents would - at least temporarily - be more fearful of social situations with peers. Furthermore, during adolescence some aspects of self-restraint are expected to improve. For example, research has shown that adolescents become more considerate of others (Cauffman & Steinberg, 2000). Although this ability would keep adolescents from engaging in problem behaviors, it might create a vulnerability to experience social fears.

The relationship between another model of psychosocial development and social fears has been directly tested, namely ego development. Ego develop-

ment – a model introduced by Loevinger (1993) - can be measured independently of age and is an index of a child's level of psychosocial development. Ego development can be visualized as the glasses through which we experience the world. Westenberg et al. (2004) showed that ego development explains some of the variance on self-reported social fears, over and above age. The children at the Conformist stage (E4), which is characterized by a focus on reciprocal social relationships, and being liked and accepted, reported more social fears than children at a lower ego level, including the Impulsive (E2) and Self-protective (E3) stage. In the latter stage children are less focused on the reciprocity of friendships, but take a more instrumental view, making them less sensitive to peer acceptance and rejection. Apart from the study by Westenberg, the relationship between ego development and social fears has not been studied.

## Social Anxiety and Normal Development Study

### Background Thesis

At the start of this research project, anno 2005, few large scale studies had been conducted to study the development of social fears and anxiety (e.g., Essau et al., 1999) and no longitudinal studies were available. Furthermore, only one study had been conducted to better understand which developmental variables could contribute to the increase in social fears (Westenberg et al., 2004). For this reason the Social Anxiety and Normal Development study (SAND study, [www.sand-lu.nl](http://www.sand-lu.nl)), which included a longitudinal study, was developed. The longitudinal research project encompassed two main research strands. One strand of research and the focus of the current thesis was to track normative changes in social fearfulness and its relation with different aspects of normal development during adolescence. The second strand of research focused on comparisons between high and low socially anxious youth (see thesis Miers, 2009).

A cohort-sequential design with three waves of data collection was adopted to facilitate developmental analyses within a relatively short (three year) time span (see Table 1). The first (T1) and last (T3) data collection were considered main assessments and included two visits to the university, with a public speaking task as the main ('major') part of the second visit. The second wave



(T2) was a ‘minor’ assessment during which a selection of questionnaires was administered during a two to three hour session.

To ensure it would be possible to test the effects of pubertal development it was important to cover the whole span of pubertal development, ranging from the pre-pubertal stage to the post-pubertal stage. For this reason participants were recruited from two local primary schools as well as a secondary school. Children were not included in the study if they had known dyslexia or limited Dutch proficiency. Children were also excluded if they received any treatment, medical or psychological. However, children whose status changed during the study were retained.

Table 1. Cohort-Sequential Design with Three Data Collection Waves (T1 to T3).

	Primary School			Secondary School						<i>grade age</i>
	4 9/10	5 10/11	6 11/12	7 12/13	8 13/14	9 14/15	10 15/16	11 16/17	12 17/18	
T1 – Major 2006-2007*	C1 n=38	C2 n=44	C3 n=44	C4 n=43	C5 n=42	C6 n=41	C7 n=47			
T2 – Minor 2007-2008		C1	C2	C3	C4	C5	C6	C7		
T3 – Major 2008-2009*			C1	C2	C3	C4	C5	C6	C7	

\* Major assessment includes the Leiden PST

All primary school children who complied with the inclusion and exclusion criteria were included in the study. Because the number of secondary school students who wanted to participate exceeded the number that could be included, a selection was made. Secondary school students were selected in such a way to ensure varied educational background of the sample, an equal age and gender distribution, and to ensure it was representative of the whole group with reference to their reported level of social anxiety (i.e., including both low and high anxious youth). For the second research strand within this longitudinal study high anxious youth were oversampled (High Anxious group

n = 32; see Miers, 2009). This additional High Anxious group was not included in the studies in the current thesis. The background variables for primary and secondary school children were similar, e.g. all schools were set in a pre-dominantly middle-class area in the city of Leiden and its environs. Special attention was paid to ensure that the age groups were large enough and included similar number of boys and girls to study both main age and gender effects as well as interactions between gender and age. The final sample used for the current thesis (excluding the High Anxious group) included 299 participants.

### **The Leiden Public Speaking Task**

A crucial element of the longitudinal research project is the Leiden Public Speaking Task (Leiden PST). A public speaking task was selected for several reasons: 1) Most studies that had investigated age differences in social fear had used self-report data and it was unknown whether age differences would also be found in a behavioral assessment task. A public speaking task allows the researcher to collect a wide array of information. In addition to self-report, it is possible to collect physiological and observational data. This way it was possible to study age differences in physical responses and to see whether independent observers reported differences in nervousness. 2) Almost all individuals with social anxiety also fear speaking in public (Lucrebier et al., 2000). Therefore, it was expected that a public speaking task would evoke feelings of social evaluation and that information collected in a speech task would be relevant to better understand social anxiety in general. 3) Finally, there seems to be some accumulating evidence that adolescents are particularly sensitive to social evaluation from peers (Westenberg et al., 2004). Hence, a public speaking task in front of a group of age peers was thought to be particularly sensitive to developmental differences.

However, at the start of the study no public speaking task was available that was suitable for our specific research aims. Subsequently, the Leiden PST was developed specifically for the longitudinal study and designed in such a way that it could be used for the study of individual and developmental differences within a longitudinal design. A detailed account of the Leiden PST which was included in both major assessments has recently been published (Westenberg et al., 2009). For this reason, a short impression is provided below.

The Leiden PST is characterized by two main elements. First, the participants are given ample preparation time. A week before their actual speech participants visited the university for their first assessment. At the end of this visit they were shown the laboratory spaces where the speech would take place and introduced to the researcher who would monitor the session. This was done to familiarize the participants with the setting of the Leiden PST and to minimize anticipatory anxiety due to the unfamiliarity of the surroundings. Furthermore, they were also given instructions about the topic of the speech. The participants were told that they were expected to talk for five minutes about the type of movies they liked or did not like. Participants were also instructed that the task was similar to presentations they had at school and thus should prepare their speech in a similar manner.

The inclusion of an extended preparation time in the design allowed us to study developmental differences with reference to different time points, this is during anticipation to a social situation and during the situation itself. The emergence of abstract reasoning (e.g., Piaget, 1972) might make anticipation to social situations especially sensitive to show developmental changes, resulting in increased anticipatory fears and concerns during adolescence. Furthermore, the fact that the participants knew beforehand what the task comprised, allowed us to use the task multiple times in a longitudinal project. Most public speaking tasks make use of an impromptu speech (e.g., Kirschbaum, Pirke, & Hellhammer, 1993), and such a task is not similar when participants are invited for the second time. Finally, allowing participants to prepare makes the task more similar to a real situation as youth encounter at school.

Second, the Leiden PST makes use of a pre-recorded projected audience of age peers and a teacher rather than a live audience of confederates. The audiences were filmed under supervision of a professional director and the audience members were instructed to show natural but neutral behaviors. The children were allowed to look into and away from the camera, hereby creating the illusion of natural eye contact between the speaker and the audience members. Thus, audience behaviors were fully controlled. The advantage of a standard audience is that for example age effects or individual differences cannot be

deduced to differences in audience behavior. Previous studies from the SAND research group showed that audiences respond differently to for instance socially anxious versus non-socially anxious children, treating the anxious children more negatively (Blöte, Kint, & Westenberg, 2007).

### **Assessments**

In addition to the speech task, the current study included several developmental variables apart from age to study the normative changes in social fearfulness during adolescence. Several other variables were selected for the second strand of the longitudinal project that compared differences between high and low socially anxious youth (see Miers, 2009; Miers, Blöte, Bokhorst, & Westenberg, in press). An overview of the variables selected to study the normal developmental pattern of social anxiety is presented in Table 2. Measures that are included in the current thesis are indicated with a dagger symbol. Data presented were all taken from the first assessment (T<sub>1</sub>).

### **The PhD-project**

The first year of the five year graduate research was devoted to working out the details of the study, obtaining permission from the Medical Ethical Committee, recruitment activities and organizing research facilities, e.g. constructing the lab spaces. Much time was taken up by constructing a lab space that would perfectly accommodate the longitudinal research project. The lab space consisted of two experimental rooms and one control room. The presence of two experimental rooms allowed us to run parallel sessions. This way children could choose to come to the university with a friend, which was expected to increase participation rate of more timid youth. Furthermore, to facilitate testing the lab spaces were outfitted with, among others; 1) one-way screens to monitor participant activities, 2) a locally controlled air-conditioning system which kept temperatures constant over all sessions to enhance the quality of physiological recordings, 3) a ceiling-mounted (integrated) projector to minimize projector noise, and 4) a large projection screen to project the pre-re-

corded audience life-size.

Table 2. Overview of Developmental Variables included in Longitudinal Research-Project

	<i>Assessment Time</i>			<i>Chapter</i>
	<i>T1</i>	<i>T2</i>	<i>T3</i>	
<b>Pubertal Development</b>				
Pubertal Development Scale (Petersen, Crockett, Richards, & Boxer, 1988)	*†	*	*	3
Tanner Schematic Drawings (Taylor et al., 2001)	*	*	*	
<b>Psychosocial Development</b>				
Self-Restraint Scale (Weinberger & Schwartz, 1990)	*†		*	5
Resistance to Peer Influence (RPI, Steinberg & Monahan, 2007)	*†	*	*	6
Ego development (SCT-Y, Westenberg et al., 2000)	*		*	
<b>Cognitive Development</b>				
Six Parts Test (BADS-C, Emslie et al., 2003)	*		*	
Recursive Thinking Measure (Miller, Kessel, & Flavell, 1970)	*		*	
Analogies (DAT, Evers & Lucassen, 1991)	*		*	

† included in current thesis \* included at time of assessment

Data collection commenced in the fall of 2005 and will come to a close at the end of 2009. Unfortunately, the project experienced some unexpected delays which resulted in a year's extension of its run. First, the construction of the lab took more time than expected, because the university building was in the process of being remodeled at the same time. Another obstacle was the disappointing number of primary school children from the partner school, which meant that a third school had to be recruited for the project. Because of the delay, the data collection for T<sub>3</sub> was still ongoing at the end of this PhD-project. Hence, the thesis does not report on longitudinal data, but only on the cross-sectional data collected at the first data wave.

#### **Outline of the current thesis**

The current thesis consists of two parts. In Part I (Chapters 2 – 4) the main question whether adolescents grow increasingly more fearful of social evaluative situations is posed. Thus, Part I investigated the normative developmental

pathway of social fears and which aspects of social fears are particularly sensitive to developmental change. In addition, a start was made to investigate which aspects of adolescent development might contribute to this phenomenon. In short, do social evaluative fears grow stronger or more salient during adolescence? In Part II the psychometric properties of two measures of psychosocial development were studied.

### **Part I**

Although social fears are thought to be on the rise during adolescence, several studies are available that do not show this increase and in some cases even show a decrease of social fears (e.g., Gullone, King, & Ollendick, 2001, Gullone & Lane, 2002). Chapter 2 reflects on methodological issues that might be part of the reason for these contradictory findings. In this chapter age differences in distress and avoidance were studied. By studying both distress and avoidance it was possible to test the argument posited by Rapee and Spence (2004) that age differences are stronger in life interference (i.e., operationalized as avoidance) than distress. At the same time a comparison was made between different types of social situations. This was done to test whether some situations are more sensitive to developmental differences. Following Westenberg et al. (2004) it was expected that social evaluative situations would show the strongest age differences.

Following the investigation of age differences in self-reported social fears, Chapter 3 investigated developmental differences in subjective and biological stress responsivity. To the best of our knowledge no (longitudinal) studies were available that investigated increased stress responses in a large community sample of adolescents with a social evaluative stressor allowing the differentiation between anticipatory responses and responses to the task itself. It was expected that the increase in social fears observed during adolescence would result in stronger physical responses during a social stressor. Because earlier studies showed that adolescents might be particularly sensitive to social evaluation by peers, a speech task in front of age peers (see Leiden PST above) was employed to measure their stress responses. In addition to age, this chapter investigated the contribution of pubertal development to social fears.

Because only little is known about how adolescents experience public

speaking, Chapter 4 focused on how adolescents experience public speaking situations. The chapter discussed the public speaking experience in general and investigated whether age differences could be exposed in these experiences. These age differences might possibly elucidate the increased fear of social evaluative situations. In order to capture the whole spectrum of thought, beliefs, concerns and cognitions that might be important for adolescents closed ended questionnaires were complemented with an interview. Therefore, the study allowed us to investigate both qualitative and quantitative age differences in the public speaking experience.

## **Part II**

Although much attention has been paid to the possible role of puberty in the increase of social fears (e.g., Thompson & Goodvin, 2005), it was deemed important to include additional developmental variables when studying the development of social fears. Only few instruments were available in Dutch to assess psychosocial development. For this reason the Self-Restraint Scale (Weinberger & Schwartz, 1990) and Resistance to Peer Influence Scale (Steinberg & Monahan, 2007) were translated into Dutch and their psychometric properties were investigated. Both constructs are central elements of Cauffman and Steinberg's (2000) model of psychosocial development.

It is important to note that psychosocial development is multifaceted and develops at different speeds. Self-restraint has different aspects and possibly different relationships with social fear. For example, self-restraint includes consideration of others, which Cauffman and Steinberg (2000) reported to improve from grade 8 to adulthood. It was expected that youth who report high levels of consideration of others might be more sensitive to experience social fears. Second, resistance to peer influence was expected to show a temporary decrease during mid-adolescence, making adolescents particularly sensitive to peer opinion (Steinberg & Silverberg, 1986). Thus, the developmental pattern of resistance to peer influence could contribute to a temporary experience in social fears.

Due to the unexpected delays as described above, the longitudinal data collection was ongoing by the end of this PhD project. Therefore, it was not yet possible to investigate the contribution of the different maturational variables (including the psychosocial developmental variables) to the normative developmental pattern of social fear within the current thesis. In Part II of the thesis,

however, an account was given of the development and psychometric properties of self-restraint (Chapter 5) and resistance to peer influence (Chapter 6) measures. In the near future the relation between those two instruments and social fears can be studied.





## CHAPTER 2

## Social fears during adolescence: is there an increase in distress and avoidance?

*This chapter has been published as: Sumter, S.R., Bokhorst, C.L., & Westenberg, P.M. (2009). Social fears during adolescence: is there an increase in fear and avoidance? Journal of Anxiety Disorders, 23, 987-903.*

### Abstract

Mid-adolescence is considered as the time of onset for social phobia and is assumed to be related to a normative increase of social fears. People diagnosed with social phobia, however, do not only experience high levels of fear or distress, but also report avoidance behavior. Little attention has been paid to the development of avoidance behavior during adolescence.

In the current study, a community sample with 9-17 year olds (N = 260) completed a questionnaire derived from the Anxiety Disorders Interview Schedule for Children (ADIS-C) [Silverman, W.K., & Albano, A. M. (1996). *Anxiety disorders interview schedule for DSM-IV child version, child interview schedule*. San Antonio: The Psychological Corporation]. They rated their levels of distress and avoidance in a variety of social situations. The results showed an age related increase for formal speaking and interaction situations in both avoidance and distress, with a stronger increase in avoidance than in distress. The same pattern was found for girls for situations regarding observation by others. No effects were observed for informal speaking and interaction situations.

### Introduction

Mid-adolescence is considered as the time of onset for social phobia. Most studies report an age of onset for this disorder of 10 years or older (Rapee &

Spence, 2004). Prevalence rates of social phobia during adolescence exceed those during childhood and continue to increase throughout adolescence. Essau, Conradt, and Petermann (1999) conducted an epidemiological study among 1035 adolescents from a community sample and found the diagnosis of social phobia to increase from 0.5% for 12–13 year olds to 2% among 14–17 year olds. Wittchen, Stein, and Kessler (1999) showed that this increase continued into late adolescence and young adulthood. In their sample the prevalence rate for the 14–17 year olds was 4.0%, the prevalence rate for the oldest age group, i.e. 18–24 year olds, was 8.7%.

### **Social phobia and social fears**

Increase in the prevalence of social phobia with age has been ascribed to an increase in social fears during adolescence. However, this assumption has not always been supported by studies on social fear (e.g. Gullone, King, & Ollendick, 2001; Gullone & Lane, 2002). Although some studies report an increase during adolescence (e.g., Weems & Costa, 2005; Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004), other studies report that levels of social fear are stable (e.g., Gullone et al., 2001) or even diminish during this time period (e.g., Gullone & Lane, 2002).

Previous research has demonstrated that use of subtypes can be very enlightening when studying developmental pathways. Within social fears it has been possible to distinguish different clusters or subtypes of fears which show different age patterns. It appears that while fears for certain social situations do not change over the course of development, other social fears do show an increase with age. Westenberg et al. (2004), for example, studied three subtypes of fears within the Fear of Failure and Criticism scale of the Fear Survey Schedule for Children- Revised (FSSC-R; Ollendick, 1983). They observed an increase for items with a clear social evaluative component (i.e. Fear of Social evaluation and Fear of Achievement evaluation), whereas a decrease was found for Fear of Punishment where the social evaluative component is less strong. When these items were combined in the total Failure and Criticism scale, no age differences were found. This finding demonstrates that the study of specific subtypes of social fears separately might better the understanding of the development of social phobia.

### **Social phobia and avoidance**

People diagnosed with social phobia do not only experience high levels of distress, but also report avoidance behavior. Avoidance has been mentioned as a factor that contributes to a worsening of the disorder (Chartier, Hazen, & Stein, 1998), to the maintenance of anxiety disorders (Muris, 2006) and is a crucial element of a social phobia diagnosis, see DSM IV-TR (American Psychiatric Association, 2000). Hence, increase of social phobia diagnoses during adolescence might be related to increasing levels of distress, but also to a general increase in avoidance behavior.

Rapee and Spence (2004) propose that it is exactly this behavioral part, i.e. avoidance, that changes most during adolescence, rather than a further increase in distress. They argue that “the apparent onset of social phobia during early adolescence may perhaps have more to do with the increase in life interference caused by social anxiety at this developmental stage than with an increase in actual levels of social distress” (Rapee & Spence, 2004, p. 741). This suggests that inclination to avoid social situations that are experienced as stressful, increases more with age than the level of distress. In a clinical sample preliminary evidence has been provided for this increase in avoidance with increasing age. Rao et al. (2007) found that children and adolescents diagnosed with social anxiety disorder (SAD) differed in how they rated their level of avoidance. From the diagnostic interview it emerged that socially anxious adolescents were more eager to avoid social situations than their younger counterparts. Some examples of the situations are “musical or athletic performance” and “speaking to adults.” In addition, they reported more distress in these situations compared to children, and in half of the situations there were more adolescents than children who reported moderate to severe levels of distress. This study shows that at least for a clinical population it appears that with age both levels of avoidance and levels of distress increase. It is unclear whether this also happens within a non-clinical sample.

The exact characteristic of the relationship between avoidance and anxiety has received limited attention (Heimberg, 2003). One reason for this might be that in clinical populations anxiety and avoidance are often difficult to distinguish, because at a clinical level avoidance and anxiety will most often be

highly correlated. For example, Heimberg et al. (1999) report a correlation of .91 between avoidance and anxiety in their clinical sample. To study the relationship between the two, it seems necessary to include non-clinical participants as well, where the range in avoidance and distress might be much larger.

There is some evidence that avoidance is related to non-clinical levels of social fear. Essau et al. (1999) found that the majority of the 12–17 year old adolescents in their community study who reported some social fears also indicated avoidance of the accompanying social situations. Although this study showed that social fears and avoidance are related, they did not investigate whether age related changes in avoidance could be observed in their sample. In conclusion, although avoidance is recognized as an important element of social anxiety disorder and social fears in general, little information is available on the age pattern of avoidance.

#### **Current study**

In summary, to better understand the increase in prevalence of social anxiety disorder during adolescence, it seems important to investigate the age pattern of distress and avoidance in an adolescent community sample with a broad age range. The study focuses on three main issues.

(1) *Age differences in reported distress and avoidance.* On the basis of previous findings (Westenberg et al., 2004) we expect that for some situations (i.e. highly evaluative situations) distress will show a clear increase, but not for social fears in general. For this reason the age patterns will be studied for three different social domains, which vary in the centrality of the social evaluative component. The three domains that will be investigated are based on Hofmann et al.'s (1999) categories and include: (1) formal speaking and interaction, (2) informal speaking and interaction, and (3) observation by others. The use of these three subtypes has been validated in a recent study by Cox, Clara, Sareen, and Stein (2008). Their two nationally representative mental health surveys revealed the three factor solution for social situational domains as described above. The 'formal speaking and interaction' category seems to have the strongest social evaluative part. Therefore, one would expect age differences in distress to be most pronounced for this category. Whereas age differences in distress are mainly expected to occur in formal social situations, age

differences in avoidance are expected for all social situation with the strongest increase for formal situations (Rapee & Spence, 2004).

(2) *Comparisons between distress and avoidance within each age group.* Furthermore, we will test the hypothesis proposed by Rapee and Spence (2004) that the inclination to avoid will show a steeper increase than reported levels of distress during adolescence. These divergent age patterns might result in an increasing discrepancy between reported levels of avoidance and distress for each of the three domains. Because younger children might not have the opportunity to avoid, due to strict parental guidance, the willingness to avoid might already be present. Thus the children are instructed that in the current study avoidance also reflects their willingness to avoid. The willingness to avoid might actually be crucial in the final step from fear to phobia and might be viewed as a risk factor for developing social anxiety disorder.

(3) *Salience of formal fears in different age groups.* Finally, to investigate whether formal social (evaluative) fears do not merely show an increase with age, but also become more salient than the other fears, the relative importance of social fears within each age group will be tested. It is expected that within the youngest age group the reported levels of distress and avoidance for the different social situations are comparable. In contrast, the older children are expected to report more distress and avoidance for formal situations than informal or observation situations.

## Method

### Participants

Data used in this study are part of the Social Anxiety and Normal Development (SAND) study, which is a larger study approved by the Medical Ethical Committee of Leiden University, the Netherlands. In the present study a local primary and secondary school participated. The current sample consisted of 126 girls (48.5%) and 134 boys (51.5%). Participants were between 9 and 17 years of age, with a mean age of 13.53 ( $SD = 2.17$ ). Participants were assigned to one of three age groups in the analyses that follow, i.e., 9–11 years (children,  $n = 71$  including 33 girls), 12–14 (early adolescents,  $n = 112$  including 53 girls), and 15–17 (mid adolescents,  $n = 77$  including 40 girls).

## Measure

### ADIS-C SITUATIONS: DISTRESS AND AVOIDANCE

Participants were administered a short questionnaire based on social situations that are part of the social phobia module from the Anxiety Disorders Interview Schedule for Children (ADIS-C; Silverman & Albano, 1996). In the current study it was not possible to administer the complete ADIS-C. Following the ADIS-C social phobia module children are presented with 20 situations and asked whether they would feel distressed in this situation and whether they try or would like to avoid the situation. The ADIS-C is widely used and its social situations compare well with Hofmann et al.'s model (1999). One item from the original list was replaced. The item "reading aloud in front of your class" replaced the item "dating." This was done for two reasons: (1) dating was deemed less relevant for the younger participants, and (2) our specific interest in performance situations.

Although the ADIS-C is normally administered by a clinician, in the current project the situations were presented in questionnaire format, either by PC or paper-pencil. The participant first rated every situation for distress, indicating on a nine point thermometer scale how they would feel in the situation (1 = I feel fine, 9 = I feel extremely distressed). The same situations were also rated by the participant for avoidance. They were asked if they would avoid this situation or if that was not possible how much they would like to avoid the situation if they could (1 = I never try to avoid this situation, 9 = I always try to avoid this situation). The reliability for the distress-scale was  $\alpha = .86$  (for the three age groups reliability ranged between .80 and .89) and for avoidance  $\alpha = .81$  (for the three age groups reliability ranged between .81 and .83).

Primary school children were given more detailed instructions to make sure they understood the meaning of avoidance and distress, because in Dutch these words might be difficult for some of the younger participants. A short standard explanation and examples were given. The children were explained that they might experience some situations as more pleasant than others. When a situation is unpleasant it might cause feelings of distress which means you might not feel well or feel a little upset. They were also told that some children would avoid or want to avoid certain situations. In this case they would try not to be in the situation in different ways. Their understanding was checked by

the experimenter before the child rated the different situations.

In the current study the situations were divided in three categories, which are based on the study by Hofmann et al. (1999). The three categories are (1) formal speaking or interactions which included answering and asking questions in class, giving a speech, and reading aloud, (2) informal speaking or interactions which involved talking to people in person or over the phone, inviting children to do something together and attending parties, and (3) observation by others which included having your picture taken, using a public bathroom, eating in front of others or performing in front of others (either a play, sports, or writing on a chalkboard). The assignment of the items to the three categories was done by two researchers independently. The researchers agreed on the majority of the situations and assigned them to the same categories. Three situations could not be unanimously assigned to one of the three categories. These situations were “taking a test,” “playing/working with a group of children,” and “attending meetings.” Note that these situations were included in the overall scale.

Apart from one, internal consistency of the items of each domain was adequate to good for both distress and avoidance. For Distress the Cronbach's alpha was .65 for formal speaking/interaction, .75 for informal speaking/interaction, and .68 for observation by others. For Avoidance the Cronbach's alpha was .70 for formal speaking/interactions, .71 for informal speaking/interactions, and .55 for observation by others. The Cronbach's alphas of the subscales differed slightly between the three age groups and became better with increasing age. There was almost no difference between the Cronbach's alpha for distress and avoidance. The range of the alpha's for the 9 to 11 year olds was .37-.74, for the 12 to 14 year olds .50-.74, and for the oldest age group .56-.78.

### **Procedure**

Data presented in this study were collected as part of a larger study. For all children and adolescents active consent was obtained from the parents. The children were invited to come to the university. Participants were seated in separate cubicles to ensure privacy during the completion of the questionnaires. The ADIS-C was administered by computer to the secondary school children, while the primary school children completed a paper pencil version of the questionnaire.



## Results

### ADIS-C: correlations between distress and avoidance

Correlations were computed between the overall scores of distress and avoidance and the different social domains. Correlations for the whole sample varied between .61 and .83 (see Table 1). Strength of the correlations did not vary significantly between the age groups or sub types. Fisher-z (transformation) tests were used to compare correlations and no differences were observed.

Table 1. Correlations Between Distress and Avoidance Across Different Social Domains for the Whole Sample and Three Different Age Groups

	Overall scale	Formal speaking/ interactions	Informal speaking/ interactions	Observation by others
9-11 years	.68	.61	.72	.63
12-14 years	.79	.70	.83	.80
15-17 years	.76	.66	.83	.77
Whole sample	.76	.68	.81	.76

### ADIS-C: age differences in distress and avoidance for the overall social situations

To test whether the age pattern of avoidance and distress differed, three-way Mixed-Model Analyses were performed for the overall scores and the social domains separately. Although all analyses were conducted with the between-subjects age and gender, gender will only be discussed if significant age by gender interactions were observed at the .05 level of significance. The constructs distress and avoidance were included as within-subjects variables.

For the overall scores the construct by age group interaction was significant (Greenhouse Geisser  $F(2, 254) = 4.11, p < .02$ ), confirming that the age pattern for avoidance differs from the age pattern for distress (See Fig. 1, graph 1). To understand how patterns of distress and avoidance differ from each other, follow-up paired sample *t*-tests were conducted. The difference between the

level of reported distress and avoidance was not significant for the youngest age group ( $t(70) = 1.44$ , *ns*), whereas the two oldest age groups reported more avoidance than distress (i.e., age group 2,  $t(111) = 4.05$ ,  $p < .01$  and age group 3,  $t(76) = 4.75$ ,  $p < .01$ ). Finally, the two age patterns were studied independently with ANOVAs. Age differences were found for avoidance ( $F(2, 257) = 4.58$ ,  $p < .05$ ), but not for distress ( $F(2, 257) = 1.74$ , *ns*) when looking at the overall reported levels of distress and avoidance. The two oldest age groups reported more avoidance than the 9–11 year olds ( $p$  values  $< .05$ , Bonferroni).

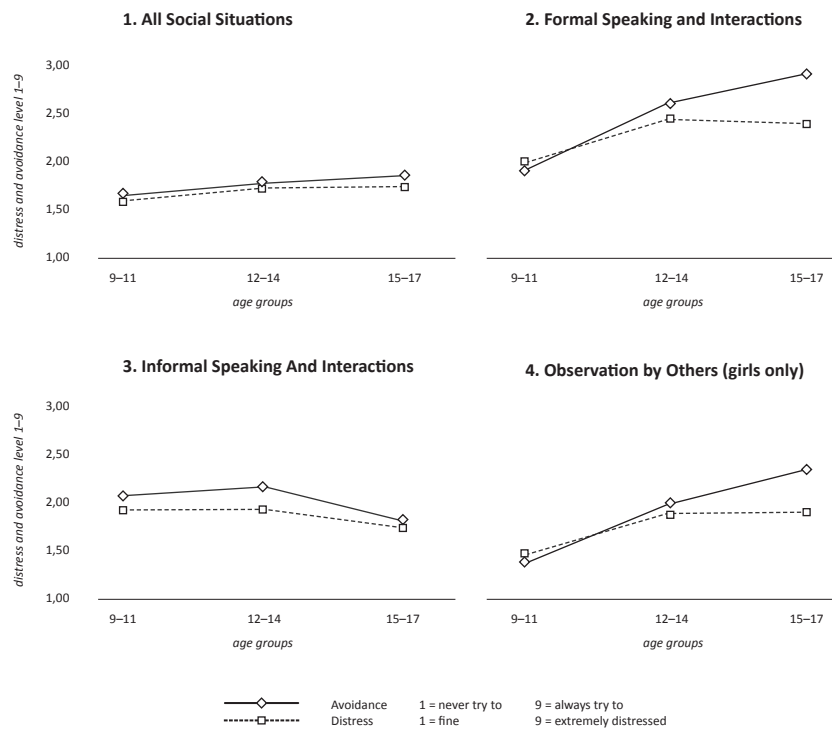


Fig. 1. Mean level of reported distress and avoidance for social situations in general and specific social domains.

**ADIS-C: Age differences in distress and avoidance for specific social domains**

*Formal speaking and interaction:* For 'formal speaking/interaction' a construct by age effect was observed (Greenhouse Geisser  $F(2, 254) = 4.55, p < .01$ ; see Figure 1, graph 2). Hence, the age patterns for distress and avoidance concerning formal speaking and interaction situations differ. To interpret the construct by age interaction, paired-sample t-tests were conducted. These tests showed that a difference between distress and avoidance was not present in the youngest age group, but was present in the 12–14 year olds ( $t(111) = -3.13, p < .01$ ) and 15–17 year olds ( $t(76) = -4.87, p < .01$ ) with higher levels of avoidance than distress.

Furthermore, the age patterns for distress and avoidance were studied separately with ANOVAs. The age effect in reported levels of distress concerning formal speaking/ interaction situations was significant ( $F(2, 254) = 3.88, p < .05$ , partial  $\eta^2 = .03$ ). As expected post hoc analyses (Bonferroni) showed that the 9–11 year olds reported less distress in formal speaking/interaction situations than the older children. However, the difference with the oldest group was at a trend level,  $p < .10$ . An age effect was also observed for reported levels of avoidance ( $F(2, 254) = 12.34, p < .001$ , partial  $\eta^2 = .09$ ). The 9–11 year olds reported less avoidance compared to the adolescents from the two oldest age groups ( $p$ 's  $< .01$ , Bonferroni). In sum, these results showed that both avoidance and distress for formal speaking/interaction increased with age, and that the increase for avoidance is steeper as shown by the significant interaction effect.

*Informal speaking and interaction:* For the domain of 'informal speaking/interaction' none of the effects tested by the three-way Mixed Model Analysis were significant (see Figure 1, graph 3). It can be concluded that the age pattern for distress and avoidance concerning this type of situation did not differ. The follow-up ANOVAs showed that the age effect for both distress ( $F(2, 254) = 1.09, ns$ ) and avoidance ( $F(2, 254) = 2.66, ns$ ) were not significant. Hence, the level of reported distress and avoidance concerning informal speaking and interaction situations did not differ between the three age groups.

*Observation by others:* For the domain 'observation by others', the three-way Mixed Model Analysis with age and gender as between-subjects variables, and distress and avoidance as within-subjects variables showed that the three-way interaction was significant (Greenhouse Geisser  $F(2, 254) = 4.264, p < .05$ ). As a follow-up, age by construct interactions were tested for boys and

girls separately. No age by construct interaction effect was found in the male sample (Greenhouse Geisser  $F(2, 131) = .24, ns$ ), while among the girls the age by construct effect was significant (Greenhouse Geisser  $F(2, 123) = 9.74, p < .01$ ). For boys the pattern of distress was similar to that of avoidance, while a difference between the two constructs emerged for girls. Hence, the difference between reported levels of distress and avoidance was only tested for girls (see Figure 1, graph 4). To study how the age pattern for distress and avoidance differed from each other among the girls paired sample t-tests were performed. These tests showed that the girls reported significantly more avoidance than distress in the 12–14 year old age group ( $t(52) = -2.22, p < .05$ ) and the oldest age group ( $t(39) = -4.65, p < .01$ ), whereas in the youngest age group the levels of distress and avoidance were not significantly different.

Finally, the age patterns for distress and avoidance were studied separately. The ANOVA conducted for distress showed no significant age by gender interaction effect. The main effect for age was significant ( $F(2, 254) = 3.16, p < .05$ , partial  $\eta^2 = .02$ ). Post hoc analyses showed that the youngest group differed from the older children at a trend level ( $p < .10$ ). The youngest group reported less distress in ‘observation by others’ situations.

An ANOVA conducted for avoidance showed that the age by gender interaction was significant ( $F(2, 254) = 4.91, p < .01$ , partial  $\eta^2 = .04$ ). Follow-up analyses showed that the age differences were present for girls, but not for the boys. For girls, all age groups differed significantly from each other ( $p$ 's  $< .05$ ), with the older girls reporting more avoidance of observation by others. Thus, for girls the age pattern observed for avoidance of observation situations was similar to the age pattern found for formal situations (i.e. more avoidance with increasing age), whereas for boys these situations were more like informal situations.

#### **ADIS-C: ranking of social situations based on distress and avoidance**

To determine the relative importance of the three social fear domains across age groups, paired samples t-tests were conducted with the three subscales for each age group separately. As expected the formal situations became more salient with increasing age. In the youngest age group distress and avoidance scores for formal ( $t(70) = 5.01, p < .001$ ;  $t(70) = 3.14, p < .01$ ) and informal social

situations ( $t(70) = 4.81, p < .001$ ;  $t(70) = 5.80, p < .001$ ) were higher than those for observation studies. There was no difference between the formal and informal situations in distress, a trend effect was observed for the avoidance scores ( $t(70) = -1.84, p = .07$ ) with more avoidance reported for the informal than formal situations.

In contrast, for the two oldest age groups reported distress and avoidance experienced in formal situations was higher than both informal (age group 2:  $t(111) = 5.63, p < .001$  and  $t(111) = 3.37, p < .01$ ; age group 3:  $t(76) = 5.72, p < .001$  and  $t(76) = 6.48, p < .001$ ) and observation situations (age group 2:  $t(111) = 6.57, p < .001$  and  $t(111) = 6.56, p < .001$ ; age group 3:  $t(76) = 4.77, p < .001$  and  $t(76) = 5.53, p < .001$ ). There was no difference in reported distress between informal and observation situations. Notably, there were opposite age differences in reported avoidance. The 12–14 year olds reported more avoidance for observation than informal situations ( $t(111) = 3.36, p < .01$ ), whereas the oldest age group reported more avoidance for the observation situations ( $t(76) = -2.49, p < .05$ ).

To explore which specific situation elicited the most distress and avoidance, we investigated age differences in the ranking of individual items. The highest mean level of distress was reported for talking to unknown people by the youngest age group, and giving a speech in class by the second and third age group. Talking to unknown people was also the situation the youngest group and the 12 to 14 year olds would like to avoid the most, whereas the oldest age group would most like to avoid giving a speech in class.

## Discussion

The current study investigated the relationship between distress and avoidance in relation to social situations and the age patterns among children aged 9–17. For this purpose a community sample of children and adolescents rather than a clinical sample was selected. Because in a clinical sample distress and avoidance are intrinsically highly correlated, it was deemed necessary to study distress and avoidance separately among a community sample. In addition, a distinction was made between specific situations in which social anxiety can occur. This was done to reveal possible diverging developmental patterns for

different social domains, which might not be visible when studying the overall scores which reflect social anxiety in general.

As suggested by the findings of Essau et al. (1999), the current study provides further evidence that avoidance and distress are also related in non-clinical samples. The correlations in the current study were strong (ranging from .61 to .83), but less strong than in the clinical sample tested by Heimberg et al. (1999) ( $r = .91$ ). The relationship between avoidance and distress was similar for the three specific social domains and the three age groups.

No age differences were found for the overall level of distress, i.e. reported levels of fear concerning social situations in general remained stable over time. This finding mirrors the results of studies that have used questionnaires to study the development of social anxiety (e.g., Gullone et al., 2001). However, for overall avoidance significant age differences were found, with the older adolescents reporting to be more willing to avoid social situations. This finding is in line with the suggestion put forward by Rapee and Spence (2004) that over time the inclination to avoid distressing social situations increases, while distress would remain quite stable.

We hypothesized that contrasting developmental patterns might mask an increase in distress concerning some social situations. Hence, although the overall distress score did not reveal age related changes, it was expected that analyses of the three social domains separately would reveal different results. When the three domains were studied, different developmental patterns were observed, confirming our hypothesis. For some domains age differences were found for distress and avoidance, but not for all social domains. As expected, in those situations where social evaluation was present age differences were observed. No age differences were found in the reported levels of distress or avoidance of informal speaking and interaction situations.

Notably for the formal speaking and interaction situations age differences were found for both distress and avoidance. In comparison to the youngest age group, the two older groups were more fearful of formal speaking/interaction situations and they indicated a stronger willingness to avoid the situations. Although both distress and avoidance increased for these situations, it is important to note that the increase for avoidance was steeper compared to

distress. It seems that while distress mainly increases during early adolescence, avoidance seems to continue to increase throughout adolescence. Future studies might include late adolescents and young adults to investigate whether these trends continue. Furthermore, the current study reported on cross-sectional data only, which limits the possibility to test steepness. The difference in steepness and developmental change of avoidance and distress can be best tested in a longitudinal study.

Notably, in addition to the fact that the older age groups reported more distress in the formal speaking and interaction situations than the younger age groups, these situations also became the most important social fear. While the situation that was feared the most in the youngest age group was speaking to unknown people, the oldest age groups feared giving a speech which has a strong evaluative component.

An alternative explanation for the increase in social evaluative fears and accompanying avoidance would be that the older adolescents have had more experience with these situations and possibly encountered a greater number of negative experiences. However, the current sample included normally developing adolescents. For this group the number of positive experiences was probably not very different from the number of negative experiences. Furthermore, for most fears exposure brings about a decrease in the fear. Across development we see that children report less fear when they get older, with the exception of social fears (Weems & Costa, 2005).

For situations depicting observation by others, gender played an important role. A different developmental pattern was observed for boys and girls. There were no age differences in distress, only in avoidance. However, while the boys of the different age groups reported similar levels of avoidance, the oldest girls reported higher levels of avoidance than the youngest age group. This result concurs with the findings of research conducted in the field of the development of self-esteem. Especially during adolescence girls seem to become more concerned with their physical appearance. Harter (1993) found that while boys perceive their physical attractiveness quite positively throughout adolescence, girls rate themselves to be less attractive over the course of development (i.e., grade 4–11). Furthermore, Kling, Hyde, Showers, and Buswell (1999) state that “the perceived self-importance of appearance in determining self-esteem is higher in women” (p. 491). The domain observation by others seems to be the

type of situations that trigger concerns about physical appearance. Furthermore, Essau et al. (1999) reported that the gender difference in reported fears they found, with girls reporting more social fears, was only significant for the situation “doing something in front of other people.” This would explain why girls are more inclined to avoid this type of situation than boys and that this inclination grows stronger with increasing age. At the moment the relationship between self-esteem and avoidance of certain social situations is merely based on theory. Future studies should further investigate these possibilities by including a multi-faceted self-esteem measure in studies of social fear.

Charting the development for specific situations or domains of situations reveals divergent patterns which could help explain previous research findings, e.g., studies that report no age differences in social fears. If a researcher would include both performance and general social situations no age difference might be found, because age related increases and decreases for assorted social situations cancel each other out. In the current paper the overall finding that an increase in distress was absent masked the fact that in a specific social domain (i.e., formal speaking/interaction) an increase in reported levels of distress could be observed. Also in the study by Westenberg et al. (2004) analyses showed significant age differences for one social domain, i.e. social evaluative domain, but not for another, i.e. punishment. Furthermore, this is the case for both distress, and avoidance. Although age differences in avoidance also emerged at the overall level, the analyses of the different sub-domains provided new information. Increase in avoidance of formal situations was much stronger than for social situations in general and no age differences were found for avoidance of informal situations.

In sum, findings from the current community sample are for the most part in line with the developmental differences reported by Rao et al. (2007) in their clinical sample. In both studies adolescents reported more avoidance compared to children in many situations. In some situations adolescents also reported more distress than children, especially the social evaluative situations. Hence, from the current study it becomes clear that there is not only a difference in the clinical manifestation of symptoms between children and adolescents with social anxiety disorder as reported by Rao et al. (2007) where adolescents reported more avoidance, but that a normal developmental pattern underlies this difference.



A finding not hypothesized was the fact that the overall levels of avoidance were higher than those observed for distress, especially in the older age groups. It might be easier for adolescents to admit to some social fears when the questions are phrased more indirectly. Rather than asking adolescents how distressed they feel in social situations, questionnaires might assess whether they like this type of situation or if they would prefer to do something else. More indirect ways of assessing social fears might yield interesting results in future studies. Adolescents might be more inclined to provide answers that are less socially desirable.

Although the scores observed in the current community sample of children and adolescents might appear to be relatively low, they can still provide valuable insight. First, little is known about avoidance in community samples and no norm scores are available for both distress nor avoidance. Second, even in this limited range we found age differences which were in line with our expectations. Finally, as mentioned above although avoidance and distress were related, the participants reported more avoidance than distress and this discrepancy became larger with increasing age. These three issues seem to underline that in spite of the low scores, meaningful variation was observed. More research is necessary to investigate whether other instruments are more suitable to assess avoidance in community samples. These measures of avoidance, as was already the case in the current study, could provide the researcher with additional interesting information.

A couple of limitations of the current study warrant to be mentioned. Due to the limited evidence available for reliably measuring avoidance among community samples, it remains unclear to what extent the willingness to avoid can be compared with actual avoidance behavior. It is also unclear whether avoidance is a direct enough measure of life interference. Do adolescents only show an increase in the willingness to avoid certain situations or will they also mention that their fear interferes more with their daily functioning in general?

Finally, the change in format of the ADIS-C from an interview to a questionnaire might have had some consequences. First, not having a clinician present who can probe for further information or clarification, might have led to underreporting by the participants. Second, the relatively low reliability of

some scales in some groups needs to be looked at in future studies. Additional items should be designed to increase the number of items per scale. Notably, the Cronbach's alpha for the distress and avoidance scale were not very different. Thus, the low reliability of some scales cannot explain the diverging patterns of avoidance and distress that were obtained in the current study.

For future research, it would be interesting to investigate whether the fact that adolescents are more inclined to avoid certain social performance situations translates to stronger physiological responses during these types of situations. During adolescence there are many performance situations, for instance at school, that are difficult to avoid and they will have to endure. Does this mean that when they are placed in a performance situation, their physical "fear" responses are stronger? For this reasons it is necessary to compare children and adolescents' physiological responses in real-life situations, either in the laboratory or at schools.

From the current study it seems that an increase in self-reported avoidance is a part of normal development from childhood to adolescence, especially in performance situations of a high social evaluative nature, like formal speaking and interaction. Therefore, the rise in social phobia prevalence during adolescence should not only be ascribed to normative increases in social distress, but possibly also avoidance. This underlines the need for developmentally tailored assessment of social phobia. Future research should focus on which levels of distress and avoidance are developmentally to be expected and when these levels are actually deviating from normal development.



## CHAPTER 3

## Developmental differences in stress responses during a public speaking task: Do adolescents grow more sensitive to social evaluation?

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### Abstract

**Background** — During adolescence pubertal development is said to lead to an increase in general stress sensitivity which might create a vulnerability for the emergence of psychopathology during this period. However, the empirical evidence for increasing stress sensitivity is scarce and mixed.

**Methods** — Self-reported nervousness and biological responses (salivary cortisol and alpha-amylase) were investigated during a social-evaluative stressor, the Leiden Public Speaking Task, in 295 nine to seventeen year olds. Specific attention was paid to different elements of the task, that is anticipation to and delivery of the speech.

**Results** — Biological reactivity to the speech task increased with age and puberty, particularly during anticipation. In contrast, subjective experience of stress did not increase with developmental maturity. Gender differences were not observed for biological responsivity but were observed for self-reported nervousness. Older males reported less nervousness than younger ones, whereas no age effect was observed for the girls.

**Conclusions** — Current findings support the idea that biological stress sensitivity increases during adolescence, at least in response to a social-evaluative situation. The increasing stress sensitivity appears related to pubertal maturation, but might also be due to cognitive development. The discrepant findings between biological stress sensitivity and self-reported nervousness might have clinical implications and should be the focus of future research.

## Introduction

Adolescence has been described as a period of increased stress sensitivity. As a result adolescents should show temporarily increased emotional responding, which Dahl refers to as 'normative affective changes' (Dahl, 2004, p. 7). Whereas infants and children are in some way buffered from stress it seems that the end of childhood is marked by the emergence of adult-like, somatic responses to stress (Gunnar & Vazquez, 2006). Several researchers (see for instance Dahl & Gunnar, 2009) attribute this change in stress sensitivity to puberty. Puberty causes many changes in the body on different levels. Among others there are hormonal, physiological, and motivational changes, and the emergence of secondary sex characteristics. All of these changes are said to make adolescents more sensitive to stress.

To study changes in stress sensitivity most research to date has focused on changes in basal levels of different systems (e.g., Kiess et al., 1995, Netherton, Goodyer, Tamplin, & Herbert, 2004). However, it is also informative to investigate age differences in the resulting *stress responsivity*. In a recent commentary, Spear (2009) commented on the value of studies that assess "patterns of somatic activation in response to stressors and other challenges during puberty and the broader adolescent period" (p. 91). Two recent studies (Gunnar, Wewerka, Frenn, Long, & Griggs, 2009; Stroud et al., 2009) investigated age and puberty effects on subjective and objective stress responses to a social stressor, that is an adapted version of the (Child) Trier Social Stress Test (TSST; Kirschbaum, Pirke, & Hellhammer, 1993). The TSST involves an impromptu speech followed by an arithmetic task in front of an audience.

Gunnar et al. (2009) used the TSST child version in a sample of 82 nine to fifteen year olds. For a subset of this sample ( $n=52$ ) information on puberty was also available. Stress responsivity was investigated through subjective and endocrinological data. The task resulted in the expected higher levels of self-reported distress (i.e., I feel completely relaxed vs. totally freaked out) and cortisol. Although no age differences were observed in self-reported distress, weak age effects were observed for cortisol responsivity. Fifteen year olds

responded more strongly than eleven year olds ( $p < .10$ ) and puberty was marginally correlated with cortisol responsivity ( $p < .10$ ). Gender differences were not obtained for subjective nor objective measures, except for the finding that among 13 year olds, girls had a stronger cortisol response than boys.

Stroud et al. (2009) used social exclusion tasks in addition to an elaborated version of the TSST. Two developmental groups were created based on age and pubertal status (39 children, 7–12 years and 43 adolescents, 13–17 years). The age ranges served as a proxy for Tanner stages I–III (early-mid puberty) and stages IV–V (late puberty). Participants were randomly assigned to either the TSST or social exclusion tasks. Stroud et al. measured changes in positive and negative affect and two biological stress parameters – cortisol and alpha-amylase. In line with Gunnar, the task affected subjective experience (i.e., the task resulted in expected higher levels of negative and lower levels of positive affect) and elicited a physical response. No age differences were observed in subjective experience, but adolescents did show increased physical responding compared to children. For the TSST a statistically significant response was observed for cortisol, but not alpha-amylase, while for social exclusion tasks the opposite was observed. Gender effects were not studied, because of a lack of power.

Based on these two studies the evidence for increased stress responsivity during adolescence seems mixed. On the one hand age effects were absent for self-reported distress, but the findings did provide preliminary evidence for an increase of biological stress responsivity, although the reported effects are rather weak (Gunnar et al., 2009) and inconsistent across biological parameters (Stroud et al., 2009). This might be due to: (i) limited statistical power as a result of relatively small samples per developmental group, and (ii) inadequate assessment of pubertal development. Stroud et al. used age as a proxy for puberty, while Gunnar et al. assessed pubertal development for a subset of their sample. This makes it difficult to draw firm conclusions about the contribution of puberty to stress sensitivity.

In addition, it might be useful to distinguish between different components of responses to social stressors, that is the anticipatory response to an upcoming stressor and the immediate response to the stressor at hand. Most stress

studies try to avoid any form of anticipation within their design, as this might blunt the response to the task itself (Nicolson, 2008). Anticipation is thought to be kept to a minimum when participants have no foreknowledge about the upcoming task. In laboratory public speaking protocols this is accomplished by asking participants to give an impromptu speech; participants are not aware that the experiment includes giving a speech or they do not know ahead of time what their speech should be about (see Gunnar, Talge, & Herrera, 2009). However, the distinction between an anticipation effect of an impending speech task and the immediate effect of the speech task itself might be especially important for revealing developmental differences. Because peers and their opinion become more important during adolescence (Nelson, Leibenluft, McClure, & Pine, 2004), older adolescents might start to worry about a speech task in advance whereas younger adolescents might respond more strongly while doing the speech.

#### **Current Study**

The main focus of the current paper is whether age and pubertal differences can be observed in stress responsivity as a result of pending social evaluation in a public speaking task. For this reason, a large scale study was conducted, including enough 9 to 17 year old girls and boys to investigate differences in responsivity related to age and pubertal development. The Leiden Public Speaking Task (Leiden-PST; Westenberg et al., 2009) used in the study allowed for a differentiated investigation of an anticipation effect of an impending speech task and the immediate effect of the speech task itself.

Subjective stress experience was investigated in terms of self-reported nervousness. The biological response was studied with two components of the human stress system: cortisol as a measure of the response of the Hypothalamic-Pituitary-Adrenocortical axis (HPA-axis), and alpha-amylase as a measure of Sympathetic Nervous System (SNS) activity. The two branches of the stress response work on different timeframes. Cortisol responds slowly and its peak can be detected around 20 minutes after a stressor's onset (Nicolson, 2008). It is a suitable measure of enduring stress rather than a short stressor. In contrast, alpha-amylase is released at times when the body needs the most energy, at the

time of action (Granger, Kivlighan, El-Sheikh, Gordis, & Stroud, 2007). Consequently, cortisol might be more sensitive to developmental differences during anticipation, whereas alpha-amylase might be more sensitive to developmental differences during the task.

Although self-report data have consistently shown that girls report greater social-evaluative concerns than boys, gender differences related to biological responsivity appear absent in youth (e.g., Dedovic, Wadiwalla, Engert, & Pruesner, 2009). Hence, explicit attention was given to potential gender effects on both subjective and biological stress responsivity.

## Method

### Participants

Data used in the current study are part of the Social Anxiety and Normal Development study (SAND; e.g., Miers, Blöte, Bokhorst, & Westenberg, in press; Sumter, Bokhorst, & Westenberg, 2009; Westenberg et al., 2009) which was approved by the Leiden University Medical Ethical Committee, the Netherlands.

Participants were 144 girls (48.8%) and 151 boys (51.2%). The participants were between 9 and 17 years of age, with a mean age of 13.10 ( $SD = 2.23$ ) for boys and a mean age of 13.18 for girls ( $SD = 2.32$ ;  $t(293) = -0.29$ ,  $ns$ ). Participants were assigned to four age groups, namely 9-10 years ( $n = 68$ ), 11-12 ( $n = 79$ ), 13-14 ( $n = 71$ ), and 15-17 ( $n = 77$ ). The sample included children from all educational streams in the Dutch school system representing varied levels of intelligence in the whole sample and within all age groups. Parents provided active consent; written assent was obtained from participants themselves.

### Leiden Public Speaking Task (Leiden-PST)

The Leiden-PST is modelled on a classroom presentation that the age group is familiar with. The participants are requested to speak for five minutes about the type of movies they like or do not like in front of a video camera and a pre-recorded audience of age peers and one female teacher. A week before the actual speech participants are invited to the university; they visit the lab spaces



where the speech takes place. They are provided with instructions about the speech and are asked to prepare for it as they would for a presentation at school. The fact that all participants are informed about the speech task a week before allows for a differentiated investigation of the elevated stress related to the upcoming speech (i.e., Anticipation Response) and the immediate response caused by the speech itself (i.e., Task Response). The Leiden-PST has been shown to result in elevated levels of self-reported nervousness and physical responses during the task as well as in anticipation to the task in young adolescents (ages 13 to 15; Westenberg et al., 2009).

Full details of the task are provided by Westenberg et al. (2009). Briefly, the procedure entailed five phases: (1) participants watched a 25 min nature video in order to settle down psychologically and physiologically, (2) three-minute instructions were provided by the researcher to highlight the social-evaluative aspect of the task (e.g., the videotaped speech would be evaluated by age peers at a later date), (3) five-minute rehearsal time, (4) five-minute speech, and (5) a 30-minute post-task/recovery phase with various assessments and watching a 10 min clip from the nature film. All sessions started at 14:15 to minimize diurnal effects.

Following Westenberg et al. (2009), recovery levels were taken as the best approximation of rest-state levels, whereas pre-speech levels would be influenced by the anticipatory stress response. Hence, the anticipation response was indexed by a positive difference between pre-speech and recovery. The task response was indexed by a positive difference between speech and pre-speech.

### Measures

*Self-reported nervousness.* Self-reported nervousness was measured with visual analogue scales (VAS; Davey, Barratt, Butow, & Deeks, 2007) at three different moments during the task. The participants indicated how nervous they felt by placing a vertical mark on a 100 mm line anchored by two labels, this is not nervous at all (0) and very nervous (100). VAS-ratings were obtained after the nature video (i.e., pre-speech value), after speech task (i.e., speech value), and at the end of recovery (i.e., recovery value).

*Biological stress parameters.* A total of seven saliva samples were collected to assess cortisol and alpha-amylase. The first saliva sample was taken after the nature video (i.e., pre-speech sample). Five saliva samples were taken after the speech task, at 5 to 10 minute intervals, to account for the fact that individuals differ in the timing of the cortisol response to a stressful event (Gunnar & Talge, 2007). Following Newman, O'Connor, and Conner (2007) the maximum value after the speech was taken as the best approximation of the individual stress response (i.e., speech sample). The seventh, and last, saliva sample was taken at the end of the recovery period (i.e., recovery sample).

Saliva samples were collected by passively drooling into plastic vials (IBL-SaliCap®, Germany) directly or through a straw. The determination of cortisol in saliva was performed with a competitive electrochemiluminescence immunoassay ECLIA using a Modular Analytics E170 immunoassay analyzer from Roche Diagnostics (Mannheim, Germany). The sample volume was at least 50L. For cortisol missing values due to insufficient volume ranged between 0 and 2.7% for all samples. Outliers ( $> 30$  nmol/l) were removed at individual time points rather than excluding all samples of the relevant participant; three pre-speech samples, one speech and two recovery samples. The remaining values were log transformed because the raw scores were strongly skewed.

The determination of salivary alpha-amylase (sAA) was performed with an enzymatic colorimetric assay using the maltoheptaoside (EPS) substrate on a P-module clinical chemistry analyzer (Roche, Germany) in 400-fold diluted saliva samples. For sAA missing values due to insufficient volume ranged between 0 and 2% for the samples. Outliers ( $>3$  SDs) were removed at individual time points rather than excluding all samples of the relevant participant. Five pre-speech samples were removed and four recovery samples. sAA values were log transformed because the raw scores were strongly skewed.

*Pubertal development.* Pubertal status was measured with a self-report questionnaire, the widely used Pubertal Development Scale (PDS; Petersen, Crockett, Richards, & Boxer, 1988). To assess Tanner stages three characteristics of pubertal change were used for girls (pubic hair growth, breast development, and menarche) and two for boys (pubic and facial hair development;

see Crockett, 1988). Tanner stages could be determined for 284 participants: pre-pubertal ( $n = 46$ ), beginning ( $n = 50$ ), mid ( $n = 76$ ), advanced ( $n = 73$ ), and post-pubertal ( $n = 39$ ). Because girls mature at a faster pace than boys, girls were overrepresented in the post-puberty group. To equalize the gender distribution the advanced and post-pubertal group ( $n = 112$ ) were combined. Puberty correlated significantly with age ( $r = .78, p < .01$ ).

#### Data analysis

Preliminary analyses were conducted to test whether the Leiden PST brought about the expected changes in self-reported nervousness, cortisol and sAA in the total sample. To test whether the task elicited a stress response, a Mixed-Model ANOVA was run for all three variables, with sample time (Time: pre-speech, speech, recovery) as within-subject variable and gender as between-subjects variable.

To test developmental effects on the stress response two sets of analyses were performed. First, Mixed-Model ANOVAs were run to test the effects of age and puberty on self-reported nervousness, cortisol, and sAA, with Gender and Developmental Group (age groups or Tanner stages) as between-subjects variables, and sample time (Time) as within-subject variable. A significant Time x Developmental Group interaction effect indicates an effect of developmental maturity on the stress response.

Second, because the current research questions focused on disentangling anticipation and task responses, follow-up analyses were conducted to directly investigate the effect of development on both components of the stress response. For the three dependent variables difference scores were calculated to index both responses: the Anticipation Response was calculated by subtracting the recovery value from the pre-speech value, whereas the Task Response was calculated by subtracting the pre-speech value from the speech value. ANOVAs were then conducted to test the effect of age and puberty on both responses, with Developmental Group and Gender as between-subjects variables.

## Results

### Preliminary analyses: effect of the Leiden PST

Mixed-Model ANOVAs with Time as within-subject variable and Gender as between-subjects variable showed a significant main effect of Time for all variables, indicating that self-reported nervousness ( $F(2, 285) = 658.33, p < .001$ , partial  $\eta^2$  ( $\eta_p^2$ ) = .82), cortisol ( $F(2, 277) = 246.15, p < .001, \eta_p^2 = .64$ ) and sAA ( $F(2, 275) = 167.76, p < .001, \eta_p^2 = .55$ ) fluctuated during the public speaking session (see Table 1). Post hoc analyses showed that all values for each variable differed from each other ( $ps < .001$ ). Specifically, speech values were higher than pre-speech values (i.e., task response), and pre-speech values were higher than recovery values (i.e., anticipation response). Main and interaction effects for gender were not found.

Table 1. Effect of Leiden Public Speaking Task on self-reported nervousness, cortisol (LN) and alpha-amylase (LN).

	Pre-speech value	Speech value M (SD)	Recovery value	Post hoc differences
Nervousness (N=287)	37.39 (23.70)	61.80 (26.73)	7.20 (11.31)	all differ at $p < .001$
Cortisol (N=279)	1.98 (0.55)	2.19 (0.52)	1.75 (0.60)	all differ at $p < .001$
Alpha-amylase (N=277)	12.49 (1.00)	12.82 (1.04)	12.24 (1.07)	all differ at $p < .001$

### Does stress responsivity to the Leiden PST differ between age groups and pubertal stages?

Two sets of analyses were performed to assess the effect of developmental maturity on the stress response. First, the findings from Mixed-Model ANOVAs revealed the expected effect of age and puberty on the stress response. A statis-

tically significant Time  $\times$  Age group interaction was found for all variables: self-reported nervousness ( $F(6, 556) = 3.48, p < .01, \eta_p^2 = .04$ ), cortisol ( $F(6, 548) = 8.33, p < .001, \eta_p^2 = .08$ ) and sAA ( $F(6, 544) = 4.04, p < .01, \eta_p^2 = .04$ ). A three-way interaction Time  $\times$  Age group  $\times$  Gender was significant only for self-reported nervousness ( $F(6, 556) = 2.52, p < .05, \eta_p^2 = .03$ ). Follow-up analyses showed that the Time  $\times$  Age group interaction was significant for boys ( $F(6, 286) = 4.60, p < .001, \eta_p^2 = .09$ ), but not for girls ( $F(6, 268) = 1.26, ns$ ).

A Time  $\times$  Pubertal stage interaction was found for self-reported nervousness ( $F(6, 534) = 2.42, p < .01, \eta_p^2 = .03$ ), cortisol ( $F(6, 530) = 6.27, p < .001, \eta_p^2 = .07$ ) and sAA ( $F(6, 526) = 2.32, p < .05, \eta_p^2 = .03$ ). Interaction effects for gender were not obtained.

Second, developmental effects were further explored with ANOVAs that specifically tested the effect of developmental maturity on each component of the stress response (i.e., anticipation and task response)

1. *Anticipation response.* The findings for anticipation are presented in Figure 1A through Figure 1C. A significant Gender  $\times$  Age group and Gender  $\times$  Puberty interaction was observed for self-reported nervousness (respectively,  $F(3, 282) = 3.21, p < .05, \eta_p^2 = .03$  and  $F(3, 271) = 3.79, p < .05, \eta_p^2 = .03$ , see Figure 1A). Follow-up ANOVAs showed age and puberty effects for boys (i.e.,  $F(3, 146) = 6.31, p < .001, \eta_p^2 = .12$  and  $F(3, 138) = 7.74, p < .001, \eta_p^2 = .12$ ), but not for girls (respectively,  $F(3, 136) = 0.65, ns$  and  $F(3, 133) = 0.96, ns$ ). In contrast to our expectations, follow-up polynomial analyses showed a significant linear decrease with age (Linear Contrast Estimate (LCE) =  $-14.42, p < .001$ ) and puberty (LCE =  $-16.10, p < .001$ ) for boys. Furthermore, boys from the two oldest age groups and the two most advanced pubertal stages reported less anticipatory nervousness than the two younger age groups and boys from the pre- to beginning pubertal stages ( $ps < .05$ , post hoc Bonferroni).

Age and puberty effects were observed for cortisol (respectively,  $F(3, 271) = 5.26, p < .01, \eta_p^2 = .06$  and  $F(3, 262) = 4.15, p < .01, \eta_p^2 = .05$ , see Figure 1B). Interaction effects with gender were not significant. Follow-up polynomial contrast analyses demonstrated that cortisol effects were as expected, namely a positive

linear pattern for age and puberty (respectively,  $LCE = 1.81$ ,  $p < .001$  and  $LCE = 1.73$ ,  $p < .01$ ). Post hoc tests showed that the oldest age group showed more anticipation than the two youngest age groups ( $ps < .05$ , Bonferroni), and the 13-14 year olds ( $p = .06$ ). Likewise, the advanced/post pubertal group showed more anticipation in cortisol than the pre-pubertal ( $p < .05$ , Bonferroni) and beginning to mid pubertal youth ( $ps = .05$ , Bonferroni).

In contrast, no age and puberty effects were observed for sAA (respectively,  $F(3, 269) = 2.18$ , *ns* and  $F(3, 260) = 0.90$ , *ns*, see Figure 1C). Furthermore, the 2 (Gender) x 4 (Age group) ANOVA also showed a main effect for gender ( $F(1, 269) = 4.00$ ,  $p < .05$ ,  $\eta_p^2 = .02$ ), but no gender by age group interaction effect. Girls showed a stronger sAA anticipation response than boys.

2. *Task Response.* The findings for the task response are presented in Figure 1D through Figure 1F. A significant Gender x Age group interaction was observed for self-reported nervousness ( $F(3, 284) = 3.52$ ,  $p < .05$ ,  $\eta_p^2 = .04$ ; see Figure 1D). An age effect was observed for boys ( $F(3, 145) = 4.42$ ,  $p < .01$ ,  $\eta_p^2 = .08$ ), but not for girls ( $F(3, 129) = 1.29$ , *ns*). A significant cubic pattern was found for boys (cubic CE =  $-16.10$ ,  $p < .01$ ). Post hoc tests showed that the 13 to 14 year old boys had a stronger task response than 11-12 year old ( $p < .01$ ), 9-10 year old ( $p = .09$ ), and oldest boys ( $p = .10$ ). The puberty effect for self-reported nervousness in relation to the task response was not significant ( $F(3, 273) = 1.19$ , *ns*, see Figure 1D) and no Gender x Puberty interaction was observed ( $F(3, 273) = 0.73$ , *ns*).

Age and puberty effects for cortisol were not significant (respectively,  $F(3, 279) = 1.23$ , *ns* and  $F(3, 269) = 0.57$ , *ns*, see Figure 1E). Interaction effects with gender were not significant.

Finally, for sAA the age effect was significant ( $F(3, 276) = 3.04$ ,  $p < .05$ ,  $\eta_p^2 = .03$ , see Figure 1F), but no gender by age group interaction was found. A significant linear increase was observed for age ( $LCE = .12$ ,  $p < .05$ ). Post hoc tests confirmed that the 13 to 14 year olds showed a stronger rise in sAA from pre-speech to speech than the youngest age group ( $p < .05$ , Bonferroni), other group differences were not statistically significant. The puberty effect showed an upward trend ( $LCE = .14$ ,  $p < .05$ ), but the ANOVA was not significant ( $F(3, 266) = 1.80$ , *ns*, see Figure 1F).

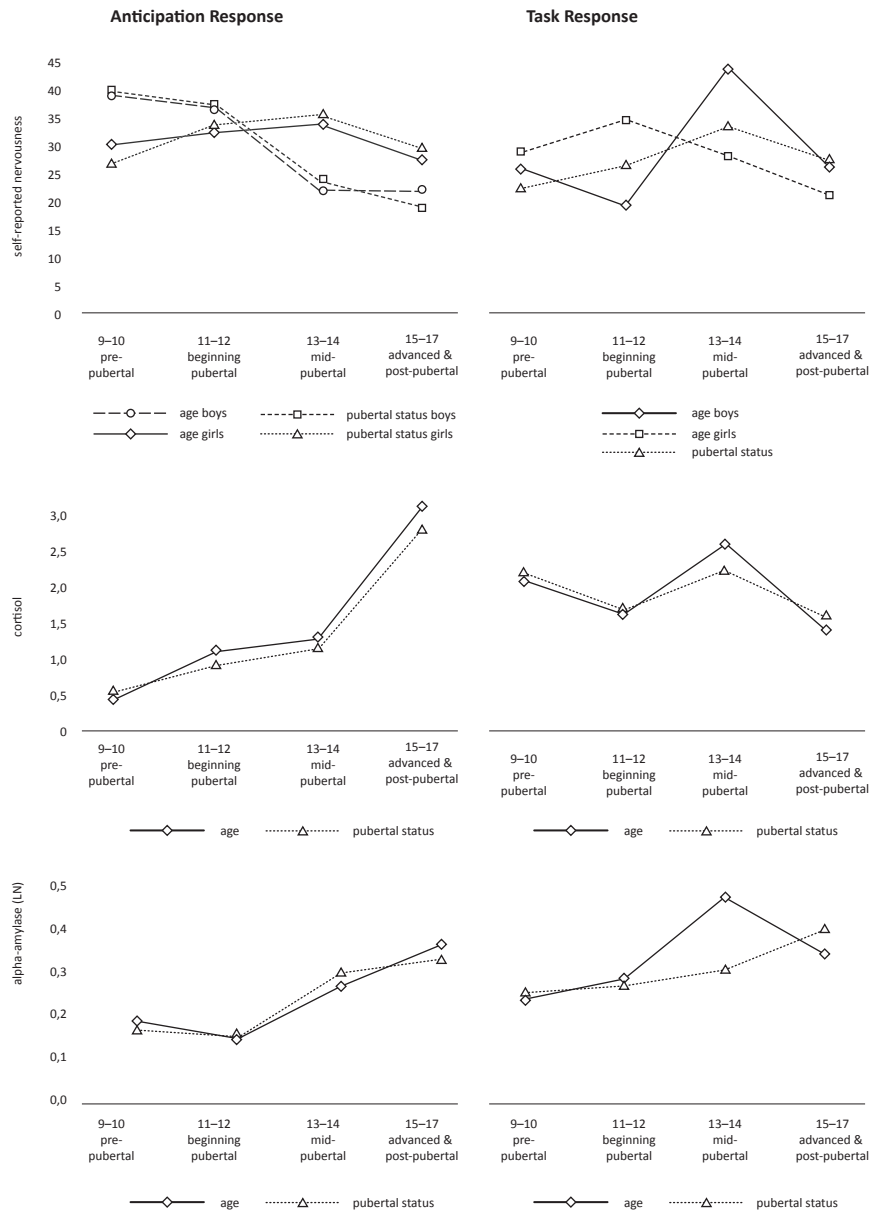


Figure 1. Age and puberty effect on anticipation and task response (from top to bottom self-reported nervousness, cortisol and alpha-amylase). Note that the four age groups are not identical to the four pubertal stages which are assessed with the Pubertal Development Scale.

## Discussion

This research investigated developmental effects on stress responsivity. A large sample was recruited to test age and puberty effects on subjective nervousness and biological responses during anticipation and task phases of the Leiden Public Speaking Task (Leiden PST). The findings provided support for increased biological stress responsivity during adolescence, whereas subjective experience of stress did not increase.

The most consistent and strongest effects were obtained for HPA-axis activity (i.e., cortisol) during the anticipation phase: this response increased with age and pubertal status, particularly during mid-adolescence and advanced puberty. Developmental effects were also obtained for SNS activity (i.e. alpha-amylase) during the speech task but these effects were weaker and less clear-cut. The weaker effect of development during the speech task might be one of the reasons why Gunnar et al. (2009) and Stroud et al. (2009) observed relatively weak stress responses during their stress tasks. They had not assessed the stress response during the anticipation of an impending speech task. The developmental effects might be most pronounced in anticipation of a known stressor.

The observed developmental effects for biological responsivity were not matched by similar effects for self-reported nervousness: subjective experience of stress did not increase with developmental maturity. Indeed, a negative developmental trend was observed for the males: older boys reported less nervousness than the younger ones in anticipation to the task. The absence of a positive trend is in line with Gunnar et al. (2009) and Stroud et al. (2009): they did not observe increases in subjective stress either. Spear (2009) suggests that adolescents might differ in how they use their somatic responses as information for emotional attribution. Whereas adults interpret their increased somatic responses during a public speaking situation as a sign of apprehension or fear, adolescents might interpret it as being excited or filled with adrenaline. This would also fit with the finding that adolescents desire to be very capable and bold as a way to enhance their status among peers (Dahl & Gunnar, 2009). This might be a reason for the present finding that older boys reported less nervousness in anticipation to the task than the younger ones.



The absence of an upward trend for self-reported nervousness during a social-evaluative situation contrasts with recent findings that show upward trends for self-reported fear of negative social evaluation. While most fears decline with advancing maturity, fear of negative social evaluation steadily increases (Weems & Costa, 2005; Westenberg et al., 2004). In addition, the tendency to *avoid* social-evaluative situations appears to increase as well (Sumter et al., 2009). It may be that older adolescents recognize their greater sensitivity to social evaluation in general, but that they are unable or unwilling to acknowledge this greater sensitivity when they are directly asked during a specific stressful social situation. Future studies need to devise similar indirect measures of subjective experience which might be more sensitive to developmental differences during experimental social stressors.

Gender effects were not observed for biological responsivity. This is consistent with the absence of gender differences in other studies of biological reactivity: adolescent boys and girls appear to respond similarly to social stressors (Dedovic, Wadiwalla, Engert, & Preussner, 2009; Gunnar et al., 2009; Kudielka & Kirschbaum, 2005). These findings are in contrast with gender effects observed for trait measures of social fear, which show that girls report more social fear than boys (e.g., Westenberg et al., 2004). Due to the influence of sex-role stereotypes boys may be under-reporting their social fears or girls might be over-reporting.

Pubertal development is presumed to be the driving force behind increasing stress sensitivity during adolescence (e.g., Dahl & Gunnar, 2009). However, in the present study the effect sizes suggest that age is a better predictor of biological responses than pubertal development. This might be due in part to the self-report procedure for assessing pubertal development. Although the Pubertal Development Scale provides a reliable index of pubertal stage, it is still be less accurate than physical examinations (e.g., Coleman & Coleman, 2002). Moreover, in the current study age and puberty were highly correlated. Diversity in pubertal development within rather than between age groups would make it possible to study the effect of puberty independently of age.

At the same time, the present findings suggest that pubertal development might not be the sole factor behind the increasing stress sensitivity during

adolescence. The developmental effects were strongest during anticipation. This might be due in part to cognitive maturation. Adolescents' advanced cognitive abilities allow them to reflect on upcoming events, which would contribute to more worry before the actual speech and increased anticipatory stress responses. For instance, Muris, Merckelbach, Meesters, and Van den Brand (2002) showed that among 3-14 year olds participants elaborated on their worries more with increasing age and cognitive development. Furthermore, in a study by Adam (2006) adolescents reported on their mood and at the same time provided a saliva sample. This study showed that among participants who reported more worry concurrent cortisol levels were higher. Future studies should include measures of cognitive maturity in addition to assessments of pubertal development to better understand the increase in stress sensitivity.

Finally, if adolescence is a time of temporarily increased emotional responding (Dahl, 2004), it would be expected that stress responsivity diminishes at the end of adolescence. The present study showed the highest level of biological stress responsivity among the most mature groups, namely the oldest age group and the advanced/post-pubertal group. Both groups are on the edge of maturity. By including young adults in future studies the assumed transient nature of stress sensitivity could be tested.

#### **Clinical Implications**

An important contribution of the current study is the distinction that has been made between anticipation and task responses. Further studies are needed to carefully investigate the relationship between development and anticipation. Developmental differences in anticipation, rather than task responsivity, might be an important predictor for psychopathology. If anticipation responses set in relatively early in life this could serve as an indicator for psychopathology vulnerability. However, some uncertainty about the meaning of the anticipation effect remains. It is unclear from which moment on participants anticipated the upcoming speech (from the first time they heard about it, the morning of the speech, or on their way to the speech session).

The findings of the present and other recent studies provide support for the hypothesis that adolescence is a period of increased stress sensitivity (Dahl,

2004; Gunnar & Vazquez, 2006). It has been suggested that this sensitivity creates a vulnerability for the emergence of various emotional problems and substance abuse during adolescence, especially in high-risk youth (e.g., Spear, 2009; Paus, Keshavan, & Giedd, 2008). In addition, the findings of the present and other studies indicate that adolescents do not seem to recognize their increased stress levels while being in a stressful situation. Hence, clinicians should consider that adolescents might be unaware of their own vulnerability or interpret their somatic signals differently to adults. As a result an emerging problem, or possibly deviant social fear, might go unrecognized for a long time. Longitudinal studies are needed to investigate whether responses during the Leiden PST can be used as an early indicator of future psychosocial and emotional problems.

#### **Key Points**

- It appears important to distinguish between anticipation to a speech and the actual delivery of a speech.
- Including multiple stress parameters can better inform our understanding of biological responsivity in social-evaluative situations.
- There is a need to develop subjective measures that are sensitive to age differences during social stressors.
- Understanding of normative development of social fears could further our understanding of deviant development (and the onset of social anxiety disorder).





## CHAPTER 4

## The public speaking experience in childhood and adolescence: a qualitative and quantitative investigation.

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### Abstract

Adolescence can be viewed as a period of increased sensitivity to social evaluation. However, it is unclear how adolescents experience social evaluative situations like a public speaking task, and how their experiences differ across age. To assess possible qualitative and quantitative differences an interview and questionnaires were administered to 295 nine to seventeen year olds. The results showed that with increasing age adolescents had more negative expectations concerning pending evaluations. They also reported more negative and less positive ruminative thoughts. In addition, it seems that adolescents perceive a need to live up to more diverse expectations from different parties, i.e. their own, their peers and their teachers. This might be an explanation for the increasing sensitivity for social evaluative situations.

### Introduction

During adolescence we do not only observe increases in obstinate and risky behavior (Steinberg, 2007), adolescents also appear to become more reserved in certain situations. In comparison to other fears, social fears become more salient during adolescence (Weems & Costa, 2005). Recent studies have demonstrated a direct link between age and fear of social evaluation (e.g., Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004; Sumter, Bokhorst, & Westenberg, 2009), this is social-evaluative situations were experienced as more distressing during adolescence than childhood. Finally, recent studies

(e.g., Stroud et al., 2009; Sumter, Bokhorst, Miers, van Pelt, & Westenberg, 2009) have shown that with increasing age physical responses during social stressors become stronger as well.

From the social anxiety literature it seems to emerge that a developmental sensitivity to social fears is most pronounced for performance situations, e.g. public speaking. For instance, Gullone and King (1993) found divergent age patterns for some items of the social fear subscale of a version of the Fear Survey Schedule for Children. The fear of being sent to the principal decreased, while the fear of having to present in public increased. Likewise, Sumter, Bokhorst, and Westenberg (2009) found no age differences for social anxiety in general, but 12 to 17 year olds reported a greater dislike for formal speaking and interaction situations, during which they need to perform in front of their peers, compared to 9 to 11 year olds.

Although it has become clear that adolescents become more distressed with regard to social situations, particularly public speaking, our understanding of how they experience public speaking situations is limited. The current study investigated how a public speaking situation is experienced by adolescents and whether there are qualitative and quantitative differences between different age groups in relation to presenting in public. Because public speaking is a complex, multifaceted experience that requires a wide array of skills from the speaker, there are several aspects that adolescents can perceive as more or less important for a successful speech. Public speaking might also trigger different thoughts, cognitions and concerns and adolescents might have different perceptions of their ability to do well. This complexity and the lack of literature regarding this topic make it difficult to formulate specific hypotheses. However, literature on adolescent development might provide some clues on which aspects of the public speaking experience might be important for youth and which of these aspects are sensitive to developmental change.

#### **Adolescent Development and the Public Speaking Experience**

Progression of cognitive development during adolescence leads to advanced reasoning skills. Rosenblum and Lewis (2003, p. 274) argue that this emerging ability to reflect on “abstract ideas, anticipated future events and recalled past events” come to trigger emotions during adolescence. Adolescents are able to

think of all kinds of theoretically possible outcomes for different situations which would suggest that they are able to think and speculate about all the great things that can happen, but also all the negative things that can happen. In line with the latter, Muris et al. (2002) found that with increasing age children reported more negative outcomes for situations that they were presented with. This is referred to as increased worry elaboration. In public speaking situations, the increased ability to foresee many possible negative outcomes might make adolescents more negative than children with regard to expected outcomes. Thus, adolescents might be more likely to report that they expect to perform worse than others, and will be evaluated negatively by others.

Age differences can also be expected to emerge in the days following the speech. It is expected that increased cognitive development would contribute to an increase in rumination afterwards. This increase has been observed for both genders by Jose and Brown (2008). In their study among 10 to 17 year olds they reported strong increases for girls (from age 10/12) and modest increases for boys (from age 15) in the amount of rumination. Hampel and Petermann (2005) also observed an increase in rumination in a sample of 1123 youth aged 8 to 14 years. Because most of these studies have investigated rumination as a trait variable, it is unclear whether similar age patterns would be observed for rumination after a laboratory speech task.

Speaking in public might also become more demanding due to changes that take place in adolescents' social context. One of those changes has received widespread attention in adolescence literature and seems particularly relevant to public performance: the increased importance of peer relationships (e.g., Nelson, Leibenluft, McClure, & Pine, 2004). A successful public performance can advance youth's social status among peers, but it could also damage their status, which would make performing in public especially challenging for adolescents.

In addition to the increased importance of peer opinion, adolescent development is a time of increased autonomy. During adolescence youth come to rely more on their own ideas and beliefs. This is reflected in increased resistance to peer influence during adolescence (Steinberg & Monahan, 2007) and might result in an increasing importance of their own evaluation in public speaking task.



On first sight, this move towards greater autonomy would appear to make public performance situations easier for adolescents. However, greater autonomy does not preclude a sensitivity to the views and beliefs of others. In Loevinger's model of ego development (Loevinger, 1993) this becomes clear as well. A person's ego level determines how they perceive the world around them. Several developmental stages can be distinguished within this model. Three of these are particularly relevant for the adolescent period and influence feelings of social evaluative fear (i.e., the Self-protective, Conformist, and Self-aware stages). While the self-protective youth are not worried about what others think of them, conformist youth are strongly focused on what others think, especially his peers. At a higher ego level, this is self-aware, adolescents come to value their own opinion, but are still sensitive to the views and beliefs of others. Hence, social fears are found to be dominant in both the Conformist and Self-aware ego level (Westenberg et al., 2004). The findings on self-consciousness reported by Rankin, Lane, Gibbons, and Gerrard (2004) are in line with this ego development theory. During adolescence (13-18 year olds) private self-consciousness increased, whereas public self-consciousness showed a minor decrease. Overall adolescents reported more public self-consciousness than private self-consciousness.

These parallel developments might make public speaking situations more challenging: adolescents might experience the need to please both their peers and live up to their own standards. Sometimes these standards might not easily tie in with each other, resulting in some friction. This could be one of the contributing factors to the stress caused by public speaking situations. In addition, most public speaking situations take place in an academic setting which undergoes changes during this period as well. Teachers might set increasingly higher standards, enhancing the academic achievement aspect of public speaking.

### **Current Study**

The focus of the current study was to unravel experiences, thoughts and concerns related to public speaking during adolescence. To capture the public speaking experience as a whole a wide range of measures, both qualitative and

quantitative, that covered various aspects of public speaking was used. The two main aims of the current study were: 1) to get a better understanding of the adolescent public speaking experience including thoughts concerning public speaking (e.g., what do they think makes a good speech according to different people), and 2) to investigate age differences in those thoughts and additional cognitions (e.g., performance expectations and rumination) related to public speaking. Both qualitative and quantitative age differences were investigated.

A structured interview was used to get an impression of what children and adolescents deem important in relation to public speaking and to investigated age-related differences in these aspects (qualitative differences). Three questions from the interview are highlighted in the current paper. Firstly, participants were asked how they know that their performance went well or poorly at school (Q1). It might be that due to increased autonomy, the oldest adolescents would base the judgment of their own performance more on their own beliefs, whereas younger youth would be led more by the opinion of others.

Secondly, we asked what made a good speech according to themselves, their peers, and teachers (Q2). It could be that peers are perceived to have very different expectations than teachers about what makes a good speech. If they perceive that the demands made by their peers and teachers are not the same and possibly contradictory, this might make the situation more stressful. These perceived differences between judges might also vary between age groups. For example, older youth might be more aware of differences in the standards held by peers and teachers than their younger counterparts.

Finally, adolescents were asked what they did not like about giving their speech in front of age peers (Q3). Because of increased cognitive ability, it might be that adolescents mention more diverse aspects that they do not like than children.

Based on the literature reviewed above some preliminary hypotheses could be formulated with reference to quantitative age differences in the public speaking experience, such as performance expectations, rumination and how much youth value the opinion of different judges. In line with Muris et al. (2002) who found that older adolescents were likely to envisage more negative outcomes for situations, it was expected that with increasing age adolescents

would have more negative outcome expectations before and after delivering a speech in front of age peers. In addition, adolescents were expected to report more negative and less positive thoughts about their performance a week later. These results would be in line with studies that have reported increased rumination with age (e.g., Jose & Brown, 2005). Finally, we expected to find that with age adolescents rely more on the opinion of peers but also on their own opinion (e.g., Loevinger, 1993). Because public speaking often takes place in a school setting, teachers opinion might also play a role. However, it was unclear whether age related changes would be observed in the way youth value their teacher's opinion.

## Method

### Participants

The data used in the current study are part of the Social Anxiety and Normal Development study (SAND; Westenberg et al., 2009) which was approved by the Leiden University Medical Ethical Committee, the Netherlands.

The current sample consisted of 144 girls (48.8%) and 151 boys (51.2%). The participants were between 9 and 17 years of age, with a mean age of 13.08 ( $SD = 2.23$ ) for boys and a mean age of 13.16 for girls ( $SD = 2.32$ ;  $t(293) = -0.30$ , *ns*). Participants were assigned to four age groups, i.e. 9-10 years ( $n = 68$ ), 11-12 ( $n = 79$ ), 13-14 ( $n = 71$ ), and 15-17 ( $n = 77$ ). The sample included children from all educational streams from the Dutch school system representing varied levels of intelligence in the whole sample and within all age groups. The participants came from a predominantly middle-class area.

### Measures

#### EVALUATED PERFORMANCE: NEGATIVE EXPECTATIONS

The measure of Evaluated Performance (EP) was designed by Spence, Donovan, and Brechman-Toussaint (1999) for use with different behavioral assessment tests with children. Two versions are available, i.e. one for read aloud/interaction tasks and one for speech tasks. The latter was used in the current study. The measure was administered a week before (EP before) the speech and a

week after (EP after). The EP consists of six questions that reflect how participants expect to be evaluated by peers and teachers, and how well they expect to do or have done during the speech. On a 5-point Likert scale they were asked to indicate whether they would be evaluated positively (high score) or negatively (low score). The Cronbach's alpha's for both assessment moments were sufficient, respectively  $\alpha = .75$  (EP before) and  $\alpha = .79$  (EP after).

#### POSITIVE AND NEGATIVE RUMINATION

Rumination was assessed with the Thoughts Questionnaire (TQ, Edwards, Rapee, & Franklin, 2003). The TQ measures both positive and negative thoughts after a speech task. Each scale consists of ten items and participants rated how often they had had those thoughts in the week following the speech on a 5 point Likert scale (0 = never and 4 = often). To fill in the TQ, participants were sent an email six days after the speech asking them to complete the questionnaire online. The questionnaire was completed by 71% of the sample. This sample included 103 girls and 106 boys equally distributed over the four age groups ( $\chi^2(3) = 1.25, ns$ ). The reliability was good for both the positive rumination scale (Cronbach's alpha is .88) and negative rumination scale (Cronbach's alpha is .92).

#### INTERVIEW

The questions included three closed-ended and three open-ended questions. A bottom-up scoring system was devised for the open-ended questions, i.e. the answers were used as starting points for categories. A scoring manual was developed, and all answers were scored by the first author. A random selection of participants ( $n = 33, \pm 11\%$ ) was coded by an independent researcher based on the scoring manual. The correspondence between the two coders was adequate and is mentioned below for the different questions.

*Open-ended Question 1 (Q1):* How do you know that your speech went well when at school? The answers given to Q1 were assigned to one or two of the following three categories: 1) *Internal answers* which are answers that reflected that participants knew for themselves how it went. In this situation, adolescents referred to personal standards, e.g. the fact that they had not made any

or few mistakes. 2) *External answers* which were answers that reflected that participants took into account the opinion of others. These answers referred to how the audience had behaved during or after their speech (e.g., had the audience asked questions, did they look interested or give you compliments after). In addition, these answers would refer to the grade they received for their speech. 3) *Combination answers* (i.e., internal and external answers) were applicable to adolescents who mentioned both types. If someone gave an answer that reflected both internal and external standards, this answer was coded as internal, external and the combination. Hence, the combination category overlaps with the internal and external categories. This question was asked to a subset of the sample ( $n = 194$ ). The level of correspondence between the two raters was 95%.

*Open-ended Question 2 (Q2)*. What do you and other people think is important for a good speech? Answers given to Q2 were assigned to the following eight categories: (1) *Boring*. Participants indicated it was important that a good speech should not be boring, (2) *Quality & structure*. Answers that reflected more scholastic attributes of the speech. Adolescents emphasize that a good speech should be well planned (e.g. structure and clarity of the story), (3) *Topic of the speech*, (4) *Forgetting your text*, answers that reflected that the speaker should remember what he wanted to say, (5) *Prepare*. The speaker should prepare his speech, (6) *Stance during speech*, the speaker should mind his stance during the speech (e.g. making eye contact and engaging the audience), (7) *Voice*, answers that reflected the quality of a speaker's voice (e.g. volume and speed), and (8) *Relax*, during a good speech a speaker should be relaxed and not nervous. This question was asked three times, that is with respect to the three different judges: according to adolescents themselves, their peers and their teacher(s). The average level of correspondence (and range) between the two coders across the eight categories was 95% (91-100%) for adolescents themselves, 93% (75-100%) for their peers and 93% (84-100%) for teachers.

*Open-ended Question 3 (Q3)*. What did you not like about giving the speech? Answers given to Q3 were assigned to the following nine categories: (1) Performance, not having done well, (2) Audience, the presence of the audience, (3) Nothing, liking each aspect of the speech, (4) Nerves, feeling nervous,

(5) Speech general, giving a speech in general, (6) Lab, things in the lab, like the physiological equipment, (7) Interaction, not being able to interact with the audience, (8) Evaluation, being evaluated and recorded, and (9) Preparation, having to prepare. The average level of correspondence between the coders was 97% (range : 91-100%).

*Closed-ended questions.* The participants were asked to indicate on three separate scales, ranging from not at all to very important (1 to 5), how important they find their own opinion, their peers opinion and their teachers opinion when they give a speech at school.

### **Procedure**

The children were recruited from two local primary schools and one secondary school. All parents were sent information letters with active consent forms and given the opportunity to visit the lab spaces at the university. Participation was possible only if active consent was provided. Written assent was also obtained from the participants themselves.

Children visited the university twice one week apart. During the first visit (ca. 2.5 hours), children filled in questionnaires, including the EP before. To familiarize them with the upcoming speech session and its procedure they visited the lab spaces where the speech took place and met the researchers. They were also given further instructions about the task. The researchers informed them that they were expected to talk for five minutes about the type of movies they liked or did not like and they should prepare for this as they would for a presentation at school (for detailed information on this task see Westenberg et al., 2009).

During the second visit children presented in front of a pre-recorded projected audience of age peers and a teacher (see also Westenberg et al., 2009). After their presentation they filled in a set of questionnaires, including the assessment of the *EP after*. After they had completed these questions, the researcher entered the experimental room for the interview.

A week after the speech all children were sent an email to inform them about the last questions they needed to answer on the study's website. At this moment they filled in the Ruminant Questionnaire.

## Results

### Qualitative Data

Q1: HOW DO YOU KNOW THAT YOUR SPEECH WENT WELL?

The answers to this question demonstrated that youth use internal or external information, or both to decide how well their speech went. The external answers were given most frequently, followed by the internal answers. The combination answers were mentioned the least.

To test whether age differences were present in the type of attribution mentioned, cross-tabs were conducted between age groups and the three answer categories (see Figure 1). Chi-square statistic was significant for internal ( $\chi^2(3) = 9.07, p < .05$ ) and the combination category ( $\chi^2(3) = 16.91, p < .01$ ), but not for the external category ( $\chi^2(3) = 1.49, ns$ ). These results indicated that with increasing age children more frequently provided answers that reflect how they themselves feel about their speech. The external answers remained equally and highly important in each age group. In addition, with age the responses come to include multiple sources of information, that is from the audience and their own perception.

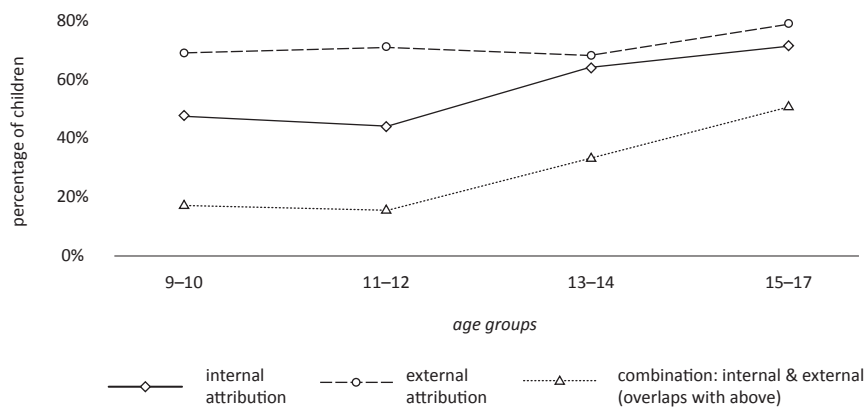


Figure 1. Percentage of children that made internal or external attributions or both.

## Q2: WHAT IS IMPORTANT FOR A GOOD SPEECH?

The participants were asked to indicate what was important for a good speech according to themselves, their peers and their teachers. Their answers were assigned to the eight different categories as described in the Method. Some categories were more frequently mentioned than others (see Table 1). The different judges were compared and age differences in the answers were investigated for each category.

Table 1. Frequencies of Responses by Age Group for Each Categories of the Question “What is Important for a Good Speech” according to Yourself, Peers, and Teachers

Category name	Judge	Age (years)				$\chi^2$ (df=3)
		9–10 %	11–12 %	13–14 %	15–17 %	
1. Boring	Yourself	4.7	11.7	19.4	20.0	8.83 *
	Peers	21.9	30.6	53.5	45.9	17.90 *
	Teachers	7.7	15.6	21.7	16.2	5.12
2. Quality/structure	Yourself	20.3	26.9	29.2	31.1	2.24
	Peers	20.6	16.7	18.3	19.2	0.37
	Teachers	30.8	24.4	27.4	44.6	8.27 *
3. Topic	Yourself	26.6	34.6	36.6	45.9	5.71
	Peers	34.4	43.1	50.7	52.7	5.69
	Teachers	35.4	44.9	68.5	70.7	26.17 *
4. Forget	Yourself	21.9	19.2	19.4	9.5	4.54
	Peers	7.8	6.9	4.2	1.4	3.82
	Teachers	9.2	9.0	9.6	1.3	5.24
5. Prepare	Yourself	39.1	19.2	26.4	17.6	10.39 *
	Peers	7.8	4.2	2.8	4.1	2.09
	Teachers	13.8	11.5	12.3	10.7	0.36
6. Stance	Yourself	23.4	41.0	43.1	54.1	13.50 *
	Peers	32.8	40.3	46.5	54.1	6.87 †
	Teachers	38.5	51.3	50.7	53.3	3.69
7. Voice	Yourself	35.9	55.1	48.6	56.8	7.28 †
	Peers	46.0	56.3	39.4	52.7	4.75
	Teachers	50.8	46.2	52.1	48.0	0.63
8. Relaxed	Yourself	15.6	5.1	15.3	14.9	5.33
	Peers	15.6	4.2	9.9	12.2	5.18
	Teachers	6.2	7.7	5.6	9.3	0.93

\*  $p < .05$  †  $p < .10$



1: *Boring*. The children more often indicated that their peers find it important that a speech is not boring compared to teachers or themselves. Furthermore, with increasing age children more often reported that they themselves and their peers found it important that a speech is not boring. This effect seems to be stronger for peers than themselves. Some just stated “that it isn’t boring”, whereas another child mentioned “That the kids like it. That you do something special, a quiz or something, or baking cookies, a treat. That is what kids like.”

2: *Quality and Structure*. The fact that the speech should be well-structured and clear seemed to be reported less often for peers compared to teachers and themselves. Furthermore, the oldest age group said that teachers pay attention to a speech’s structure most often. Some children only mentioned that it had to be “a story that flows well/that it is a coherent story”, whereas another mentioned that “you need to mention certain points issues and also a little the order.”

3: *Topic*. The topic of your speech is something that was most often reported for teachers, followed by their peers, and fewer times for themselves. With increasing age children more often reported that the topic of your speech is important to themselves, to their peers and especially their teachers. Some children mentioned that “you should pick the right topic” and you should pick “a topic you can say a lot about.”

4: *Forget*. Not forgetting what you had planned to say is something that the children indicated is important for themselves rather than something that peers or their teacher pay attention to. Limited age differences were observed for this category. An example for this category is “that they do not forget everything they wanted to say.”

5: *Prepare*. There were also differences in how important it is to prepare your speech. Answers that reflected the need to prepare your speech were most often provided for themselves, followed by teachers and least often for peers. The youngest age groups most often reported that it is important to prepare the speech. They would say that it was necessary “that you practice a lot and prepare well.”

6-8: *Stance, Voice, & Relaxed*. There were little group differences in the importance of your stance, the way you use your voice during the speech and appearing relaxed rather than nervous during your speech. However, with increasing age children more often reported that they themselves and their peers found the way you present important. Furthermore, for themselves the older children more often reported that your voice is important than the

younger children. The age differences in how relaxed you should appear are less clear.

### Q3 WHAT DID YOU NOT LIKE ABOUT GIVING TODAY'S SPEECH?

To investigate what the participants did not like about giving their speech, answers were categorized using nine categories. For the whole group, these categories were in order of prevalence: 1) *Performance* (31.4%), 2) *Audience* (24.7%), 3) *Nothing* (15.1%), 4) *Nerves* (13.7%), 5) *Speech general* (7%), 6) *Lab* (6.4%), 7) *Interaction* (6%), 8) *Evaluation* (6%), and 9) *Preparation* (5.4%) (see Method for detailed explanation of each category).

Chi-square statistics demonstrated age effects for four categories: 1) The youngest group indicated that they did not like the speech because it did not go well less often than the older groups (*Performance*:  $\chi^2(3) = 7.98, p < .05$ ). 2) The oldest two groups less frequently said that the nervousness and jitters they experienced during or before the speech was a reason for not liking the speech (*Nerves*:  $\chi^2(3) = 11.73, p < .01$ ). 3) The older adolescents more often indicated that they don't like giving speeches in general than the youngest age groups. The four age groups separately did not differ, but if age groups 1 and 2 were contrasted with group 3 and 4, the effect was significant (*Speech general*:  $\chi^2(1) = 3.83, p = .05$ ). 4) The youngest groups more often than the oldest groups said there was nothing that they had disliked (*Nothing*:  $\chi^2(3) = 13.98, p < .01$ ).

### Quantitative Data

#### EVALUATED PERFORMANCE: NEGATIVE EXPECTATIONS

To test whether older adolescents had more negative expectations with regards to pending evaluation, age differences were investigated in the expected evaluation before and after the speech. A repeated measure analysis was performed with the expected evaluations (Time: before and after the speech) as a within-subject variable and age as a between-subjects variable (see Figure 2). A repeated measures analysis allowed for the comparison of age patterns between the two moments of assessment.

The repeated measure showed no Time x Age interaction effect (Greenhouse-Geisser (GG)  $F(3, 281) = 1.37, ns$ ), but it did show a main effect for time (GG  $F(1, 281) = 145.92, p < .001, \text{partial } \eta^2 = .34$ ). The expected evaluation was less positive after the youth had performed their speech.

Follow-up ANOVAs were conducted to test the age effects for expected

evaluation before and after the speech separately. A main effect was found for age on expected evaluation before the speech ( $F(1, 284) = 4.39, p < .01$ , partial  $\eta^2 = .04$ ). The oldest age group expected a worse evaluation than the two youngest age groups (Bonferonni,  $p < .05$ ). It is important to note that no age differences in expected evaluation were present right after the speech ( $F(3, 284) = 1.87, ns$ ).

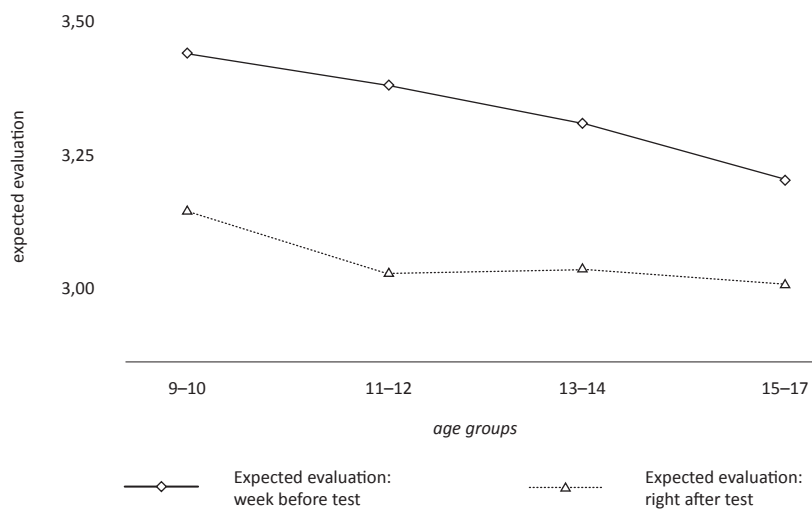


Figure 2. Expected evaluation mean scores for 4 age groups (high score = positive evaluation).

### Positive and Negative Rumination

Age differences were also investigated for positive and negative rumination (Type of rumination) reported one week after the speech task (Figure 3). A main effect was observed for Type of rumination (GG  $F(1, 205) = 34.08, p < .001$ , partial  $\eta^2 = .14$ ), with higher scores for positive compared to negative rumination. An interaction effect was observed between Type of rumination and age (GG  $F(3, 205) = 3.11, p < .05$ , partial  $\eta^2 = .04$ ).

Follow-up ANOVAs were conducted for negative and positive rumination separately. A main effect for age was found for negative rumination ( $F(3, 205) = 3.83, p < .02$ , partial  $\eta^2 = .05$ ). Follow-up polynomial contrast analyses showed a significant cubic effect for age: an increase in negative thoughts is followed by a decrease (Cubic Contrast Estimate = 0.20,  $p < .05$ ). The 11 to 12 year olds

reported more negative thoughts than the youngest age group ( $p < .02$ , Bonferroni) and than the oldest age group ( $p = .07$ , Bonferroni).

A main effect of age was also observed for positive rumination ( $F(3, 205) = 2.80, p < .05$ , partial  $\eta^2 = .04$ ). Follow-up polynomial contrast analyses showed a significant linear decrease with age, this is they reported less positive thoughts (Linear Contrast Estimate =  $-0.30, p < .05$ ). Although post-hoc analyses (Bonferroni correction) did not show age differences, an independent samples  $t$ -test showed a significant difference between the 9 to 12 year olds ( $M = 1.01, SD = 0.70$ ) and the 13 to 17 year olds ( $M = 0.91, SD = 0.73$ ) with the oldest age group reporting fewer positive thoughts ( $t(206) = 2.95, p < .01$ ).

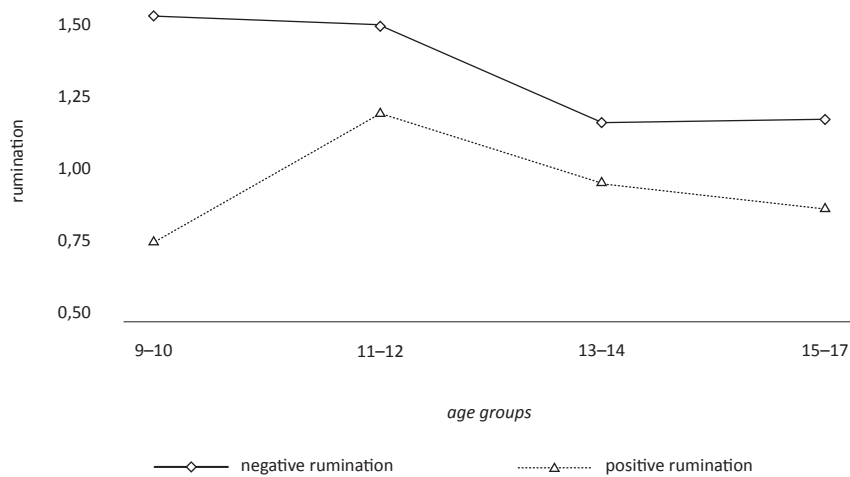


Figure 3. Negative and Positive rumination mean scores for 4 age groups (high score = more ruminative thoughts).

#### How important is someone's opinion when you give a speech at school

To investigate age differences in the importance attached to the opinion of themselves, their peers and their teachers a repeated measure analysis was performed. The judge (i.e., self, peer and teacher) was included as a within-subject variable and age as a between-subjects variable. A main effect was observed for judge (GG  $F(1.91, 556.24) = 73.56, p < .001$ , partial  $\eta^2 = .20$ ; see Figure 4). The participants valued the opinion of the teacher more than that of

their peers ( $t(294) = -10.89, p < .001$ ) and their own ( $t(294) = -10.48, p < .001$ ). There was no difference between peers and themselves ( $t(294) = -1.31, ns$ ).

An interaction effect was observed between judge and age (GG  $F(5.73, 556.24) = 2.76, p < .02$ , partial  $\eta^2 = .03$ ). To explore the interaction effect follow-up ANOVAs were conducted with the importance of own opinion, peer opinion and teacher opinion as dependent variables and age as independent variable. A main effect was found for the importance of own opinion ( $F(3, 291) = 4.02, p < .01$ , partial  $\eta^2 = .04$ ). Follow-up polynomial contrast analyses showed a significant linear increase with age (Linear Contrast Estimate =  $0.38, p < .01$ ). The two oldest age groups reported to value their own opinion more than the youngest age group ( $p < .05$ , Bonferroni). There were no age differences in how much they valued the opinion of their peers ( $F(3, 291) = 0.86, ns$ ). Finally, an age effect emerged for teachers ( $F(3, 291) = 2.95, p < .05$ , partial  $\eta^2 = .03$ ). Follow-up polynomial contrast analyses showed a significant quadratic pattern (Quadratic Contrast Estimate =  $-0.20, p < .05$ ). The oldest age group reported to value their teacher's opinion less than the 13 to 14 year olds.

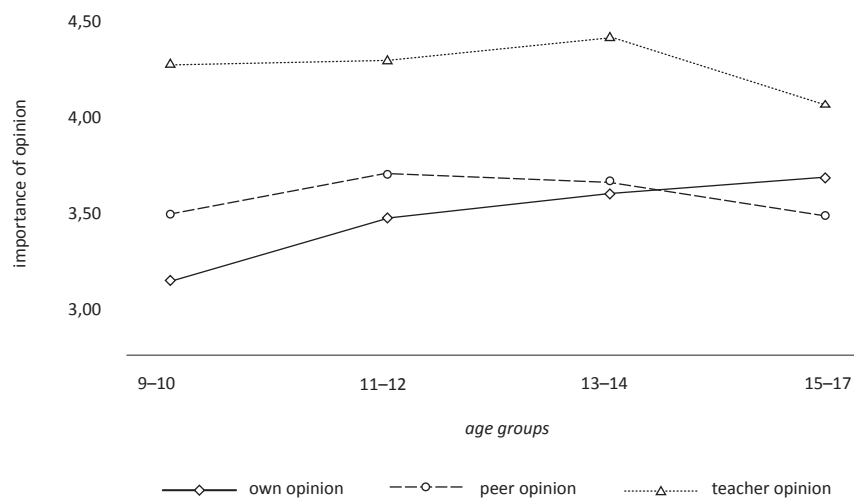


Figure 4. Age differences in the importance attached to your own opinion, peer opinion and teacher opinion (high score = more important).

## Discussion

During adolescence social evaluative fears become more salient and adolescents report a greater willingness to avoid these situations if possible (e.g., Weems & Costa, 2005). In the current study, adolescents between the ages of 9 and 17 years were confronted with a public speech in front of age peers. Using different assessment instruments we tried to get a better understanding of youth's thoughts, concerns and experiences related to public speaking. In addition, qualitative and quantitative age differences in the public speaking experiences were investigated.

### **What do adolescents think about public speaking and does this change with age?**

To the best of our knowledge the current study is the first that has tried to understand what adolescents actually think about or find important in relation to public speaking and whether it differed between age groups. For this purpose an interview was developed and three main questions were posed: 1) how do they know that a speech goes well, 2) what do they and other people think makes a good speech, and finally 3) what did they not like about giving their speech in the laboratory.

The answers in relation to the first question demonstrated that children and adolescents use external sources of information (teachers and peers) on how well they did, but also rely on their own evaluation. In line with increased autonomy which has been shown to characterize adolescence (e.g., Steinberg & Monahan, 2007), it was found that older adolescents more often gave internal explanations, whereas no age differences emerged for external sources, such as the observation that your audience looks interested, you got a good grade, or they gave you compliments. Thus, adolescents came to use an additional source of information, namely with increasing age adolescents incorporated both internal and external sources of information in their final perception of their own performance. It remains unclear whether after the age of 17 years one's own opinion becomes more important than the opinion of others.

The finding that adolescents base their opinion on both their own ideas and those around them might be challenging if the expectations they have

for themselves do not correspond with those of their peers or teacher. One of the aims was to see whether adolescents feel that there are differences in the standards for their speech held by themselves, their peers and teachers. In line with our expectations adolescents believed that their peers, their teachers and they themselves use different criteria to evaluate a speech. In addition, there were also some age related changes which seemed to show that with age the criteria adolescents mentioned for the three judges became more differentiated:

On the one hand adolescents indicated that their peers would prefer speeches that are not boring more so than they themselves or their teachers. The need for an entertaining speech was more often mentioned by the older age groups (for themselves and peers). On the other hand teachers are more often said to pay attention to the structure and more quality related aspects of your speech in addition to the topic of your speech. The older children mentioned these two criteria for teachers more often than the younger children. Finally, adolescents themselves indicated that they think it is important not to forget the lines you have prepared at home and that you prepare. Note that the need to prepare was mentioned less often by the older children. Criteria that reflected the way in which you present (i.e., voice use, mimicry and poise) was found to be equally important for all judges. These were also aspects that were mentioned relatively often (41%-49%). It is interesting to note that appearing relaxed (little outward signs of nervousness) were mentioned less frequently (ca. 10%). This is in contrast with the idea that adolescents are especially self-conscious (Rankin et al., 2004). It would be interesting to see whether explicit questions on the fear of showing outward signs of nervousness would be rated above average on a scale and show an increase with age.

Finally, it was investigated what adolescents did not enjoy about giving their speech at the university. The type of answer that was most frequently given was that they felt that it had not gone well or they had made a mistake. This reason was more frequently given by the older than the younger participants. The finding that adolescents become more negative fits with studies that show an adolescent-limited decrease in self-esteem (Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002), which might foster negative judgments of one's own performance during adolescence. The second most frequently given reason was

the presence of an audience and this was mentioned by all age groups. It might have been that the audience served as cue for the realization that their performance would be evaluated at a later date. The idea that the social-evaluative component of the task was very salient to the adolescents is in line with the finding that social evaluation and peer judgment is a central concern during adolescence (e.g. Westenberg et al., 2004; Nelson et al., 2004). Interestingly, many of the younger children stated that there was nothing that they had not liked about giving the speech. Although it was the fourth most frequently given answer, this was done so by less than 15%. This finding provides further evidence that public speaking becomes more daunting with increasing age (e.g., Sumter et al., 2009).

In addition to qualitative changes, quantitative differences between age groups in expected evaluations, rumination afterwards and the importance of the opinion of different judges were also investigated. First, the results partly supported the hypothesis that with increasing age public speaking situations become more challenging. The finding that the week before the speech the older children expected to perform worse than the younger children is in line with the study by Muris et al. (2002) who found that with increasing age children are able to think of more negative outcomes for situations. Interestingly, these age differences in expected performance evaluation were absent after they had delivered their speech. It might be that at this time actual performance influences their expectations and pending evaluations can be better, more objectively, judged. The fact that age differences were present in expectations before the speech and not after the speech, coalesces with the idea that anticipation to social evaluative situations might be especially sensitive to developmental differences (Sumter, Bokhorst, Van Pelt, Miers, & Westenberg, 2009).

Following previous rumination studies (e.g., Jose & Brown, 2008, Hampel & Petermann, 2005), it was expected that with increasing age participants would report less positive and more negative thoughts a week after the Leiden PST. As expected, the number of positive thoughts a week after the speech showed a significant negative trend with 13-17 year olds reporting less positive thoughts than 9-12 year olds. The findings for negative thoughts were less clear. The results showed a temporary increase in negative thoughts, i.e. the 11 to 12 year olds reported the most negative thoughts. Further research needs to verify



and try to explain this specific result. It should be noted that the rumination questionnaire was not completed by all participants. It is unclear whether the children and adolescents who were more negative were less likely to complete these questions.

Age differences were also observed in the amount in which participants rated the importance of their own opinion, the opinion of their peers, and their teachers' opinion when they gave a speech at school. Their own opinion was valued more with increasing age. This finding concurs with the idea that during this time adolescents become more autonomous (e.g., Steinberg & Monahan, 2007). In contrast to our expectations and previous studies that emphasized the increased importance of peers during adolescence (e.g., Nelson et al., 2004), the opinion of peers was not seen as more important by the older age groups in comparison to the younger age groups. It might be that the increase occurred at an earlier, before the age of 10 years.

The opinion of their teachers became less important over time. The fact that overall teachers opinion was valued more than the others might be related to the fact that at school their speech would be graded by their teacher. During the interview many children commented that their teacher's opinion was most important because they determined your grade. A study by Muris (1998) showed that academic worries are most often mentioned during adolescence. It would be interesting to see whether the value placed on teachers' opinion would be more strongly related to achievement evaluation than social evaluation.

#### **Limitations and Conclusions**

There are some limitations that warrant mention. The current findings are all based on cross-sectional data, which makes it difficult to draw firm conclusions about developmental changes. Longitudinal studies are needed to confirm that the reported changes are developmental in nature. Furthermore, the sample included participants from a relatively affluent area in the Netherlands. Therefore, future studies need to be conducted with a more diverse sample to test the generalizability of the current results.

With reference to the methods, at the stage of coding it emerged that some answers to the questions were not easy to interpret. Future studies would benefit from additional questions to the interview which would clarify ques-

tions that are part of the original interview, e.g. why do they value the opinion of their teacher. Finally, standard prompts should be incorporated in order to make full use of the open-ended questions and facilitate the assignment of answers to certain categories.

It is interesting to note that several questions (both qualitative and quantitative) showed that adolescents became more negative about public speaking. For one adolescents were less likely to indicate that there was nothing they had disliked about the experience than younger participants. Furthermore, adolescents had more negative outcome expectations before the speech and reported fewer positive thoughts about their performance. In theory, however, advanced cognitive development would also allow adolescents to think of numerous positive scenarios for certain situations. It remains unclear why the speech task seems to have mainly negative connotations to adolescents. A theme which emerged from both the qualitative and quantitative data might be partly responsible for these negative thoughts. The whole sample seemed to take into account the criteria of others (e.g., they valued the opinion of peers and teachers highly), but with increasing age their own opinion became more important as well. Furthermore, they appeared to be more aware of seemingly conflicting criteria set by different judges. These developments could make the public speaking situation more challenging and stressful.

In sum, the effects of the current study were moderate in size. However, most findings seemed to corroborate our hypotheses. Future studies should try and work on more sensitive methods to understand the adolescent experience of public speaking and possible age differences. The answers that the adolescents gave to the interview form a good starting point from which a new instrument to investigate the public speaking experience during adolescence can be designed.

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## CHAPTER 5

## The robustness of the factor structure of the Self-Restraint Scale: What does self-restraint encompass?

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### Abstract

In contrast with the original version of the Self-Restraint Scale (SRS; [Weinberger, D.A., & Schwartz, G. E. (1990). Distress and restraint as superordinate dimensions of self-reported adjustment: A typological perspective. *Journal of Personality, 58*, 381-417]), confirmative factor analysis did not support a four-factor solution. In the current study an exploratory factor analysis revealed a three-factor structure. Although the original subscales suppression of aggression, consideration of others, and impulse control were confirmed by the data, responsibility did not fit within the overall concept of self-restraint. These results provide some indication that although the subscales can be used independently, the way self-restraint is conceptualized should be reconsidered. Future studies are needed to confirm the factor structure observed in the current study.

### Introduction

Self-restraint can be defined as the suppression of egoistic desires (Weinberger, 1998) and “the internalized ability to regulate one’s emotions, attention and behavior” (Raffaelli & Crockett, 2003; p. 1037). Due to physical, personal or social restrictions posed upon the individual, getting what you want some-

times requires restraint of initial responses. For very young children it is often quite difficult to employ self-restraint (Siegler, Deloache, & Eisenberg, 2006). In the literature this skill is also referred to as the ability to delay immediate gratification (Putnam, Spritz, & Stifter, 2002). Over the course of development from infancy through young adulthood this ability to delay immediate gratification improves and a mature level of self-restraint is attained. Moderate levels of self-restraint are considered mature, seeing that they are more effectual than extreme levels. Like under-control (i.e. inability to delay gratification), over-control or disproportional self-restraint can be maladaptive. Over-control is linked to the use of neurotic defenses (Letzring, Block, & Funder, 2005; Weinberger, 1998).

A scale that is frequently used in studies on adolescent and adult populations is the Self-Restraint Scale (SRS) by Weinberger and Schwartz (1990). This scale has been used among clinical and community groups, and delinquents (Weinberger, 1997; Huckaby, Kohler, Garner & Steiner, 1998; Giese-Davis & Spiegel, 2001). Self-restraint is said to reflect socio-emotional adjustment. The scale has also been used as a measure of psychosocial maturity and as a predictor of various outcome measures. As a measure of maturity self-restraint has been included in Cauffman and Steinberg's model of psychosocial maturity (2000). Subscales of the SRS were used to measure impulse control and consideration of others, and used as indices of maturity (Cauffman & Steinberg, 2000).

The SRS encompasses four subordinate elements which were derived rationally. They are different manifestations of self-control and restraint. According to Weinberger (1998) self-control is driven by intrapersonal goals (Impulse Control), interpersonal goals (Suppression of Aggression and Consideration of Others) and communal goals (Responsibility).

Although the four subscales presented above have been statistically validated (Weinberger, 1997), evidence has also been provided for at least one alternative model of the SRS (Farrel & Sullivan, 2000). Farrel and Sullivan (2000) suggested that the subscale Consideration of Others should not be considered as part of self-restraint, while the other subscales were part of self-restraint.

In their samples the four-factor model was tested with a confirmatory factor analysis and the fit for this model was adequate. However, if Consideration of Others was not included in the higher order model the fit improved.

Personality research might also put forward an alternative model. In the field of personality typology, including Big 5 models, some aspects of self-restraint as formulated by Weinberger are considered part of distinct personality factors. For instance, impulse control would be linked to neuroticism, while consideration of others is more likely to be placed alongside agreeableness. While Farrel and Sullivan (2000) argued that responsibility does fit under the umbrella of self-restraint, responsibility also seems to overlap with constructs reflecting morality. Due to the presence of these alternative models, it seems appropriate to reconsider the structure of the SRS.

Although the subscales are themselves reliable and useful in research, the argument that these four facets can all be identified as different aspects of self-restraint is less convincing. Therefore, the current study will focus on the factor structure of the SRS, which will be re-examined in light of possible alternative models. For this purpose, a confirmatory factor analysis will be performed on the four-factor model proposed by Weinberger (1997). In case of a less than good fit, alternative models will be investigated using exploratory factor analyses.

## Method

### Participants

The sample consisted of 481 children and adolescents between the age of 10 and 18 (mean age = 13.78,  $SD = 2.32$ ). The gender distribution in the sample was fairly balanced: 255 girls and 226 boys. Seven schools participated in this study, i.e. 3 primary schools, 2 secondary schools, and 2 higher education schools. All children and adolescents attended regular schools at various academic levels. The schools were located in Leiden, The Netherlands and the surrounding region, representing both small and large towns.

**Self-Restraint Scale from the Weinberger Adjustment Inventory (Weinberger & Schwatz, 1990)**

The Self-Restraint Scale (SRS) is a hierarchical scale that measures four inter-related but distinct dimensions. The original dimensions are: Impulse Control (8 items, e.g. "I stop and think thing through before I act"), Consideration of Others (7 items, e.g. "I often go out of my way to do things for other people"), Suppression of Aggression (7 items, e.g. "If someone does something I really don't like, I yell at them about it."), and Responsibility (8 items, "People can depend on me to do what I know I should."). The SRS has proven to be a reliable scale that can be used with both children and adults from a community or clinical setting (Weinberger, 1997). The same four-factor structure was confirmed for all groups. In addition, it has been shown that the scale successfully predicts problem behaviour during the teenage years (Farrell & Sullivan, 2000).

The Dutch translation used in the current study was based on an existing translation (Vazsonyi, Pickering, Junger, & Hessing, 2001). This version was slightly adapted for use with early adolescents from age 10. All the items were retained. The wording of some items was simplified to make them easier to understand. The changes were made in collaboration with a professional translator. The Cronbach's alpha for the four subscales were calculated, .84 for Suppression of Aggression, .67 for Consideration of Others, .74 for Impulse Control, and .71 for responsibility. The overall reliability was .88.

**Procedure**

The current data were collected as part of a larger study. A booklet with several questionnaires was administered in class at the different schools. The participants were asked to provide some demographic information and to complete all questionnaires, including the SRS. A teacher and at least one master student were present at the time of testing to assist the participants if necessary. Before filling out the questionnaires, brief instructions were given to emphasize that there were no right or wrong answers.

## Results

### Confirmatory factor analysis

A confirmatory factor analysis was performed to examine the fit of the original four-factor structure of the scale as proposed by Weinberger (1997). Additionally, the one factor structure was examined. The confirmatory factor analyses were both performed on the same sample ( $n = 481$ ) using EQS 6.1 for Windows.

In general, the Chi square has been proposed as appropriate fit index to test a model's quality, however because Chi square is heavily affected by the sample size of a study it is recommended to present supplementary fit indices, e.g. Comparative Fit Index (CFI) and Goodness of Fit Index (GFI). For a reasonably good model fit the CFI and the GFI should exceed .90 (Kline, 2005). If a small sample is used the Root Mean-Square Error of Approximation (RMSEA) should be presented as well, RMSEA below .06 indicates an acceptable model fit (Hu & Bentler, 1999).

The fit of the one factor model was poor ( $\chi^2 (405) = 1816.984, p < .001$ ; CFI=.641, GFI=.733, and RMSEA= .085). The fit of the four-factor model was adequate, but not very good ( $\chi^2 (399) = 1101.356, p < .001$ ; CFI=.822, GFI=.852, and RMSEA= .061). The fit of the four-factor model did not compare well with the fit indices presented by Weinberger (1997). Therefore, an exploratory factor analysis (EFA) was performed to investigate whether a superior model could be proposed.

### Exploratory factor analysis

To investigate the factor structure of the scale an EFA was performed. The Kaiser-Meyer-Olkin measure of sampling adequacy was .866, which is regarded as very good, hence a factor analysis could be performed on all items (Hutcheson & Sofroniou, 1999).

The EFA with Promax rotation was used to study the factor structure in the current data. The scree-plot indicated a three-factor solution with eigenvalues of respectively 7.27, 2.59, and 1.91 (See Fig. 1). The three factors explained 39.23% of the variance.



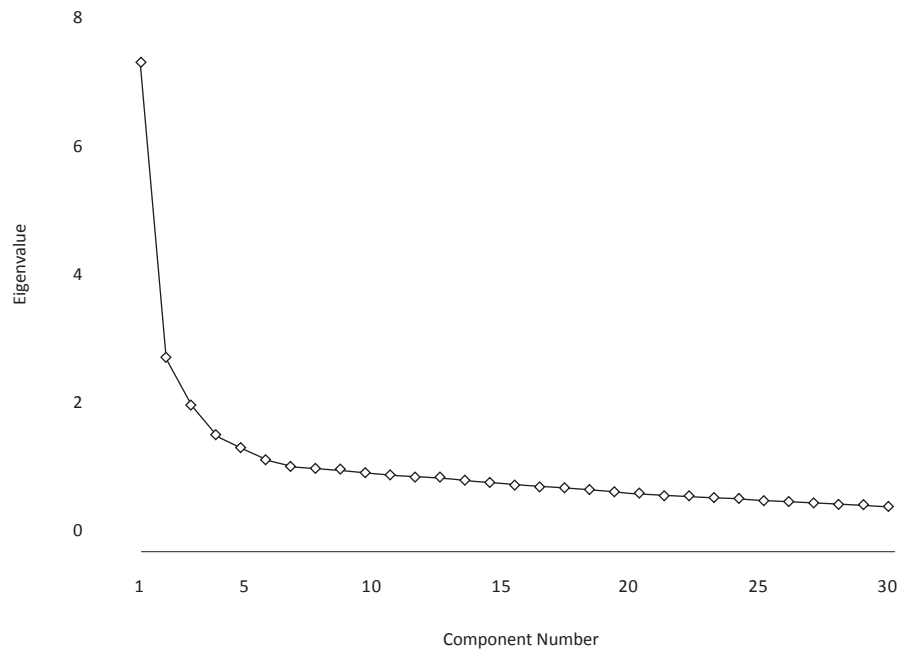


Figure 1. Scree-plot of the Self-Restrain Scale

Items that loaded above .4 and had no strong secondary loadings (i.e.  $>.40$ ) on one of the other two factors were included in the final scale (see Table 1). From the original 30 items, 18 items were retained. The three interpretable factors reflect Suppression of Aggression (7 items), Consideration of Others (6 items), and Impulse control (7 items). The Responsibility scale did not emerge within this study. Responsibility items loaded strongly on more than one factor or not at all.

The four and two-factor solution were also explored. The four-factor solution only provided one interpretable factor, i.e. Suppression of Aggression. On the basis of the content of the items, it might also be expected that the items diverge in two factors. This would be a set of items related to helping others while another set of items would be more related to impulse control. A forced two-factor model was also tested with an EFA, but the resulting factors could not easily be labeled.

Table 1. Items Retained in Self-Restraint Scale after Exploratory Factor Analysis (EFA) with Promax Rotation and the Respective Factor Loadings\*

	SA	IC	CO	Original scale
Suppression of Aggression (SA)				
Item 6: people better watch out	.71	.33	.13	SA
Item 30: fight back	.78	.31	.31	SA
Item 10: get even	.72	.36	.23	SA
Item 22: lose my temper	.71	.38	.17	SA
Item 28: say something mean	.70	.20	.27	SA
Item 20: yell at them	.64	.39	.21	SA
Item 25: pick on people	.58	.36	.28	SA
Impulse Control (IC)				
Item 18: do new and different things	.31	.71	.13	IC
Item 2: will try anything once	.28	.61	.14	IC
Item 15: tend to get carried away	.44	.58	.23	IC
Item 12: become "wild and crazy"	.41	.56	.32	IC
Item 8: do things without enough thought	.26	.55	.51	IC
Item 24: say first thing that comes into my mind	.29	.50	.47	IC
Item 3: try harder to control myself	.12	.41	.12	IC
Consideration of Others (CO)				
Item 16: will not cause problems for other people	.22	.27	.74	CO
Item 19: think how it will affect people around me	.17	.23	.74	CO
Item 26: not to hurt other people's feelings	.31	.12	.65	CO
Item 7: think about other people's feelings	.15	.21	.61	CO
Item 11: enjoy doing things for other people	.24	-.08	.49	CO
Item 1: help other people	.35	-.03	.41	CO
Excluded item, including Responsibility (RESP)				
Item 27: think before I act	.20	.50	.70	IC
Item 5: do things for other people	.05	-.31	.09	CO
Item 4: do things that are against the law	.46	.59	.33	RESP
Item 9: take things that don't really belong to me	.22	.23	.34	RESP
Item 13: do things that are not fair to people	.50	.27	.33	RESP
Item 14: will cheat if no one will find out	.33	.33	.24	RESP
Item 17: break laws and rules	.47	.59	.25	RESP
Item 21: do what I should	.10	.10	.46	RESP
Item 23: do things that aren't right	.46	.66	.26	RESP
Item 29: stay out of trouble	.27	.46	.44	RESP

\* The items presented in the table are abbreviations of the complete items.

The Cronbach's alphas of the three scales were .84 for Suppression of Aggression, .73 for Consideration of Others, and .71 for Impulse Control.

## Discussion

The Dutch Weinberger SRS (Vazsonyi et al., 2001) was adapted and in the current study the factor structure of the instrument was tested among youth (age 10–18). Confirmatory factor analyses showed that the fit of the four-factor and one-factor structure was not very good. An alternative factor solution is proposed based on the results of an exploratory factor analysis. Instead of the original four-factor structure, including impulse control, responsibility, suppression of aggression, and consideration of others, a three-factor model explained the data best.

The three scales that emerged in this study were interpretable and coincided with remaining scales of the original instrument. Especially the Suppression of Aggression and Consideration of Others subscales seem robust, with few secondary loadings. Only two items were excluded, one loaded strongly on two factors (i.e. item 27), while the other loaded negatively (i.e. item 5). The wording of item 5 might have been too complicated and not well understood by the participants.

In the new model the Responsibility scale was absent. The items of this subscale loaded strongly on more than one factor or not at all. When a four-factor solution was forced the Responsibility, Impulse Control and Consideration of Others items interspersed, leaving only one interpretable factor, i.e. Suppression of Aggression.

Even though exploratory factor analyses is a useful method of analyses to investigate possible clusters, this method results in a preliminary model (Costello & Osborne, 2004). While the current paper is not able to provide a definite alternative to the original factor solution, it is a first step in challenging the dimensionality of the Self-Restraint Scale. Future studies, conducting a confirmatory factor analysis on the proposed three-factor solution of the self-restraint, are needed to make more conclusive claims. For the current study a professional translator was employed to ensure the quality of the translation. However, the fact that a translation was used and the results could be

due to differences in language or culture, should be taken into consideration. Therefore, a cross-validation of the factor structure should ideally be done in an American sample where the original scale can be used.

While Farrel and Sullivan (2000) found that consideration of others was not a key characteristic of self-restraint, in the current study responsibility did not fit within the overall model. When self-restraint is thought to reflect someone's ability to delay immediate gratification, one can imagine several instances of irresponsible behavior executed with strong self-restraint. For instance, a person might be very calculating and wait for the right moment to break the law to make sure he won't be punished. In this case the person might not endorse responsibility items, while being high in self-restraint. Responsibility may actually be strongly intertwined with other personality characteristics, like morality. This might explain why the responsibility facet did not emerge as clearly from the analyses as the three others.

Finally, if self-restraint is considered to be an aspect of psychosocial maturity, it is necessary to investigate its concurrent validity. Hence, in future studies such a comparison could be made using validated measures of psychosocial maturity, like the Sentence Completion Task for Youth (Westenberg et al., 2000) or the Psychosocial Maturity Inventory (Greenberger & Bond, 1984). Moderate correlations between measures of psychosocial maturity and the Self-Restraint Scale would be expected. Furthermore, age differences comparing children, adolescents and adults and gender differences should be studied. These type of studies might also shed some light on how the different aspects included in self-restraint converge. Studying the age differences for the different subscales might reveal different trajectories. This could be an indication of a smaller overlap between the facets of self-restraint than originally assumed.



## CHAPTER 6

## The developmental pattern of resistance to peer influence in adolescence: Will the teenager ever be able to resist?

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### Abstract

Common folklore seems to suggest that adolescents are particularly susceptible to peer influence. However, from the literature the exact age differences in susceptibility to peer influence remain unclear. The current study's main focus was to chart the development of *general* susceptibility to peer pressure in a community sample of 10 to 18 year olds (N = 464) with the recently developed Resistance to Peer Influence Scale (RPI). The one-factor structure of the RPI was cross-validated in the present sample, and the RPI was equally reliable at all ages. As was expected general resistance to peer influence increased during adolescence. In addition, gender differences were most pronounced during mid-adolescence, when girls were more resistant to peer influence than boys. These findings are explained in terms of psychosocial maturation during adolescence.

### Introduction

When children move into adolescence, they become more independent from their parents and peer relationships gain in importance. Dyadic close friendships are formed, cliques are joined and romantic interests develop. However, peers do not replace parents but rather broaden children's social arena (e.g., Lashbrook, 2000). Adolescents' relations with peers and friends have been of interest to many researchers in psychology (see Adams & Berzonsky, 2003). Friends

are chosen on the basis of existing similarities in behavior and attitudes, but also seem to foster similarity once friendships have been established. Bi-directional influences contribute to the resemblance of friends (Berndt, 1996a). These influences among friends can be both positive and negative. Thus, peer influence appears to be an integral part of adolescent relationships.

Common folklore suggests that the majority of adolescents are particularly susceptible to the influence exerted by peers. However, inconsistent findings in the literature, as discussed below, make it difficult to draw firm conclusions about the age pattern of susceptibility to peer influence. These inconsistencies may in part be due to differences in the way resistance to peer influence has been conceptualized and assessed. In addition, little is known about how this pattern differs between males and females. The present study investigates age and gender differences in self-reported resistance to general peer influence using a recently developed scale by Steinberg and Monahan (2007).

#### **Age and Gender Differences in Resistance to Peer Influence**

Peer influence during adolescence, both positive and negative, has been studied widely (e.g., Arnett, 2007; Fergusson, Vitaro, Wanner, & Brendgen, 2007; Gifford-Smith, Dodge, Dishion, & McCord, 2005; Berndt, 1996b). There are some studies that have looked at peer influence in the context of neutral (Steinberg & Silverberg, 1986) or pro-social behaviour (e.g., Ellis & Zarbatany, 2007; Wentzel, Filisetti, & Looney, 2007; McNamara Barry, & Wentzel, 2006; Spoth, Redmond, Hockaday, & Yoo, 1996), but in most cases the focus of peer influence research has been on its negative effects and deviant behavior resulting from it. The negative connotation of peer influence becomes apparent in the outcome variables used, i.e. smoking (Urberg, Shyu, & Liang, 1990), drug abuse (Farrell & White, 1998), alcohol use (Dielman, Butchart, & Shope, 1993), and high-risk driving (Shope, Raghunathan, & Patil, 2003). It is also apparent in the content of instruments designed to measure adolescents' level of susceptibility to peer influence. Adolescents are specifically asked whether, under the influence of peers, they would do things that are prohibited. For example, in many studies adolescents are asked to indicate whether they had broken rules because others had urged them to (e.g., Santor, Messervey, & Kusumakar, 2000).

For deviant, anti-social peer influence a curvilinear relationship between age and susceptibility to peer influence is reported. This susceptibility is found to be strongest during mid-adolescence (Berndt, 1979; Steinberg & Silverberg, 1986; Brown, Clasen, & Eicher, 1986). A similar curvilinear age pattern is found for engagement in delinquent behavior (Farrington, 1986; Moffit, 1993). A particular subset of delinquent behavior generally starts to rise from early adolescence to late adolescence, after which it declines (Moffit, 1993).

The use of deviant situations in peer influence instruments and the presence of adolescence-limited delinquency make it difficult to tease apart susceptibility to peer influence in general from susceptibility to anti-social peer influence and the willingness to engage in anti-social activities (Allen, Porter, & McFarland, 2006; Steinberg & Monahan, 2007). Additionally, deviant situations might be inappropriate for children and young adolescents. Alcohol, drug abuse, or sexual attitudes are issues that are less relevant to primary school children and younger adolescents. Primary school children and young adolescents might be equally susceptible to peer influence as mid-adolescents, but it is less likely that they are pressured to use illicit drugs or drink-and-drive. It is thus not a foregone conclusion that mid-adolescents are more susceptible to peer influence than younger, or older, adolescents.

A few studies have investigated peer influence and its association with pro-social (e.g., Ellis & Zabatany, 2007; Wentzel, Filisetti, & Looney, 2007; McNamara Barry, & Wentzel, 2006; Robertson, Stein, & Baird-Thomas, 2006; Spoth, Redmond, Hockaday, & Yoo, 1996, Berndt, 1979) or neutral behavior (Steinberg & Silverberg, 1986; Allen et al., 2006; Walker & Andrade, 1996). The pro-social studies do not focus on age differences; the studies either have a small age range or do not report the age effects. The exception is the study by Berndt (1979), where no age related differences in conformity to pro-social influences was found in a sample of 9 to 18 year olds. Overall, this field of research provides us with limited information on age related differences in peer influence.

Some studies have investigated susceptibility to neutral influences (e.g., Berndt, 1979; Steinberg & Silverberg, 1986; Allen et al., 2006; Walker & Andrade, 1996; Steinberg & Monahan, 2007). These include studies that have reported age effects, but these age effects are not consistent. A curvilinear pattern was



observed by Berndt (1979) and Steinberg and Silverberg (1986). They used vignettes depicting neutral situations of peer influence in addition to anti-social situations. Although the curvilinear relationship was weaker for neutral situations compared to anti-social situations, the pattern was significant. From these studies it would seem that neutral peer influence mimics the development reported for anti-social peer influence.

However, in more recent studies the curvilinear pattern of susceptibility to peer influence was not found and a different age pattern emerged, i.e. a linear relationship. Walker and Andrade (1996) conducted an experimental study of peer influence in a neutral situation among participants of a wide age range. Walker and Andrade used an adapted version of the Asch experiment, which can be considered a measure of resistance to peer pressure in a neutral situation (i.e., judging which lines are of the same length). In this cross-sectional study children age 3 to 17 years participated. Although a simplified procedure was used for the younger children, the procedures were comparable. With age, children became less likely to follow peers in their decision-making. While 85% of the 3 to 5 year olds conformed, only 38% of the 9 to 11 year olds conformed, and none of the 15-17 year olds did. The finding that none of the older adolescents conformed is notable, however similar results have been found in other studies. Conformity in adults, as observed in the original Asch experiments, was not replicated in later studies (e.g., Lalancette & Standing, 1990). In these studies, like Walker and Andrade, adult participants adhered to their own view.

This linear relationship between age and resistance to peer influence is also found by Steinberg and Monahan (2007) who used a new questionnaire, i.e. the Resistance to Peer Influence Scale (RPI). The RPI presents adolescents with 10 neutral peer influence situations. Each item presents the participant with two options which are both acceptable choices. One group reflects highly resistant people, while the other group represents people who are easily influenced by their peers. The participant must indicate which group they belong to and to what degree they belong to this group. This study showed that reported resistance to peer influence increased linearly during adolescence, in particular between the ages of 14 and 18.

Overall, the curvilinear pattern with a peak in susceptibility to peer influence during mid-adolescence might hold up for anti-social activities, for neutral behavior the literature is less clear cut. On the basis of studies of general peer

influence (i.e. independent of anti-social activities) described above, a linear age pattern seems to be emerging. Hence, it is expected that increasing age will be associated with increasing levels of reported resistance to peer influence.

When gender is taken into account as a moderator of susceptibility to peer influence further inconsistencies arise (Urberg, Degirmencioglu, & Pilgrim, 1997). Some studies report that girls have a greater tendency to conform than boys. This gender difference is reported in research aimed at how social influences predict smoking behavior in adolescence. One study reported that girls tend to be more susceptible to take up smoking after exposure to social pressures from both parents and peers (Chassin, Presson, Sherman, Montello, & McGrew, 1986). Other studies report the opposite effect, for instance Steinberg and Silverberg (1986) found boys to be more susceptible to both anti-social and neutral pressure. More recently, Steinberg and Monahan (2007) presented similar results for general resistance to peer influence, i.e. boys reported to be more susceptible to neutral peer influence than girls, both during adolescence and young adulthood. Finally, in some studies a gender difference does not emerge at all, e.g. in the Asch conformity paradigm boys' and girls' performances were often equal (Costanzo & Shaw, 1966; Adams, Ryan, Hoffman, Dobson, & Nielsen, 1984).

Although these studies have investigated the main effects of gender, no study has looked at how gender interacts with age. Paying closer attention to possible interactions between age and gender might provide more insight into gender differences overall.

### **Study Aims**

The purpose of the current study is two-fold. First, the psychometric properties of the Resistance to Peer Influence scale (Steinberg & Monahan, 2007) are cross-validated in a normative sample of Dutch children 10 to 18 years of age. The age range is extended to include children as young as 10 years in order to report on development from late childhood onwards. Secondly, age and gender differences in the developmental trajectory of resistance to peer influence are investigated. Based on the findings by Walker and Andrade (1996) and Steinberg and Monahan (2007) it is expected that self-reported resistance to general peer influence will increase during adolescence. Finally, gender effects will be investigated.

## Method

### Participants

The sample consisted of 464 children and adolescents between the age of 10 and 18 ( $M = 13.41$ ,  $SD = 2.25$ ). The gender distribution in the sample was fairly balanced: 243 girls (52%) and 221 boys (48%). Letters were sent to the parents informing them about the study while giving them the opportunity to peruse the questionnaires at their child's school. The parents were able to object to their child's participation by mail, e-mail, and telephone. Twelve parents did not give their permission. Another fourteen children were absent at the time of testing due to illness.

Seven schools participated in this study, i.e. 3 primary schools, 2 secondary schools, and 2 higher education schools. The schools were selected on the basis of their heterogeneous student population, regarding social economic status, ethnicity and educational level. These were regular comprehensive schools with various academic levels. The schools were located in Leiden, The Netherlands and the surrounding region, representing both small and large towns. Most participants (85.1%) came from a two parent household where both the biological mother and father were present.

To analyze age differences and the age x gender interaction, three age groups were created, i.e. Group 1 (10 to 12 years,  $n = 168$ ), Group 2 (13 to 15 years,  $n = 187$ ), and Group 3 (16 to 18 years,  $n = 96$ ).

### Measure

A new scale that assesses general resistance to peer influence and can be used in large scale assessments is the Resistance to Peer Influence Scale (RPI; Steinberg & Monahan, 2007; see Appendix). Steinberg and Monahan developed this scale for use with young delinquents and the use of neutral situations was thought to diminish the influences of social desirability. Using neutral situations instead of deviant situations it might be easier for adolescents to admit to being influenced by peers. For the same reason, the items are presented in a format proposed by Harter (1985) and phrased in such a way that the 'right' and 'wrong' answers are less recognizable for the participants. In addition, this instrument is suited for use with a wide age range, from late childhood through young adulthood.

The RPI presents adolescents with neutral peer influence situations. The scale consists of 10 items, three of which are reverse-scored. Each item presents the participant with two options which are both acceptable choices, i.e. “some people...but other people...”. The participant has to indicate to which group they belong and to what degree they belong to this group. The items are presented in Appendix. In an American community sample of 11 to 24 years olds the reliability was sufficient,  $\alpha = .74$ . A confirmatory factor analysis corroborated the single factor structure of this scale (Steinberg & Monahan, 2007).

For the current study, the Resistance to Peer Influence scale was translated to Dutch and checked by a professional English-to-Dutch translator. Although some items were thought to be rather difficult for the youngest participants, all items were included for further investigation.

### **Procedure**

The RPI was administered as part of a larger study in combination with several other questionnaires to the complete class. The children were explained that the study’s focus was on peer relations and personality. In addition to completing the questionnaires, participants were asked to provide demographic information, i.e. age, gender, and family setting. The response format of the RPI was explained in front of the class before the assessment commenced and the children were presented with a sample question which they practiced. A teacher and at least one master student were present at the time of testing to assist the participants if necessary.

### **Results**

#### **Psychometric properties: factor structure and internal consistency of the RPI**

The psychometric properties of the RPI were investigated using the complete sample. To study the factor structure, a Principal Components Analysis (PCA) was performed on the ten items. The scree plot confirmed the presence of one single factor, with a clear break between the eigenvalues of the first and the second eigenvalue (see Figure 1). The first factor accounted for 30.97% of the variance. The factor loadings ranged from .27 to .76 (see Table 1). Factor loadings above .40 are generally considered to be sufficient and applicable for interpretation (Stevens, 2002). Eight items had a factor loading above .40, two items had a factor loading below .40, i.e. item 2 and 6.

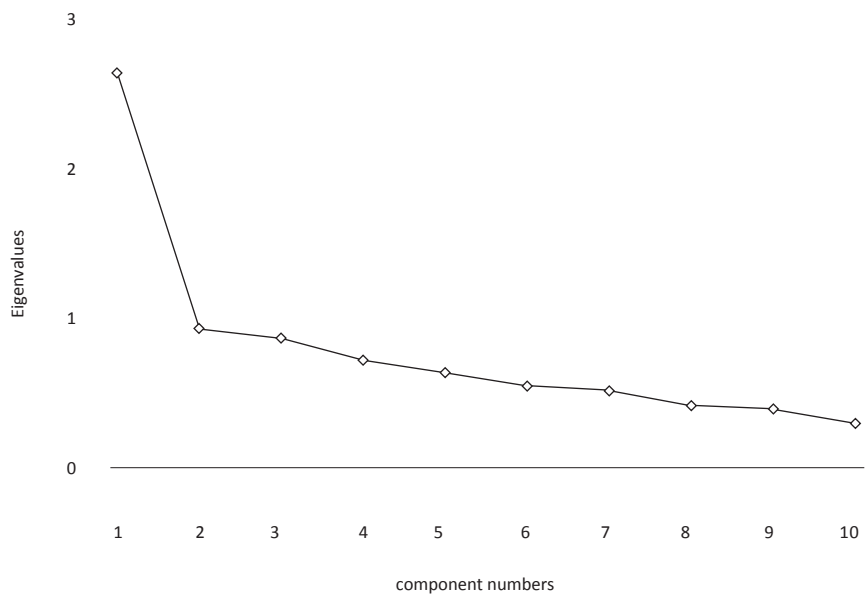


Figure 1. Screeplot for the Resistance to Peer Influence scale.

Table 1. Factor Loadings and Item Total Correlations for all the Items.

Item	Factor Loading	Corrected Item-Total correlation
1	.56	.40
2	.26	.19
3	.62	.46
4	.68	.52
5	.59	.41
6	.32	.22
7	.58	.40
8	.47	.34
9	.75	.59
10	.51	.38

To study the internal consistency of the scale, Cronbach's alpha and item-total correlations were investigated. Cronbach's alpha for the full scale was .73, and compared well with the original reliability ( $\alpha = .74$ , Steinberg & Monahan, 2007). The reliability of the RPI was comparable for all age groups;  $\alpha = .71$  for Group 1,  $\alpha = .75$  for Group 2, and  $\alpha = .70$  for Group 3.

The item-total correlations ranged from .19 to .59 (see Table 1). For the item-total correlations, a cut-off score of .30 is recommended by Nunnally and Bernstein (1994); items that fall below this cut-off score are best removed from a scale. Two items fell below this cut-off point, i.e. item 2 and 6. When both items were removed from the scale Cronbach's alpha was raised to .75.

For the subsequent analyses of age and gender differences, it was decided to retain all 10 items of the original scale for two reasons: 1) the overall reliability only showed a marginal improvement after the removal of the two items, and 2) to make as close a comparison as possible of our results to the results found by Steinberg and Monahan (2007). The age and gender differences, as reported below, were identical with the two weaker items (i.e. item 2 and 6) excluded from the scale.

#### **Age and Gender Differences in resistance to peer influence**

A 3 (Age) x 2 (Gender) ANOVA was used to investigate age and gender differences in resistance to peer influence (see Figure 2). A main effect was found for age ( $F(2, 445) = 10.63, p < .01$ , partial  $\eta^2 = .046$ ). With increasing age, adolescents reported that they felt more resistant to peer pressure. Post-hoc analyses revealed that age group 1 differed significantly from age group 2 ( $p = .033$ ) and age group 3 ( $p = .000$ ). The difference between age group 2 and 3 was significant as well ( $p = .018$ ). A main effect was also observed for gender ( $F(1, 445) = 15.10, p < .01$ , partial  $\eta^2 = .033$ ): girls reported more resistance to peer influence than boys. A trend was found for the interaction between age and gender ( $F(2, 445) = 2.61, p = .07$ , partial  $\eta^2 = .012$ ). Independent sample t-tests were performed to test the gender difference in each age group. The difference was significant during mid-adolescence ( $t(185) = -5.08, p < .01$ ). A trend effect was found for the youngest group ( $t(166) = -1.66, p = .098$ ), but the late adolescent boys and girls did not differ in reported resistance to peer influence ( $t(94) = -0.98, ns$ ).

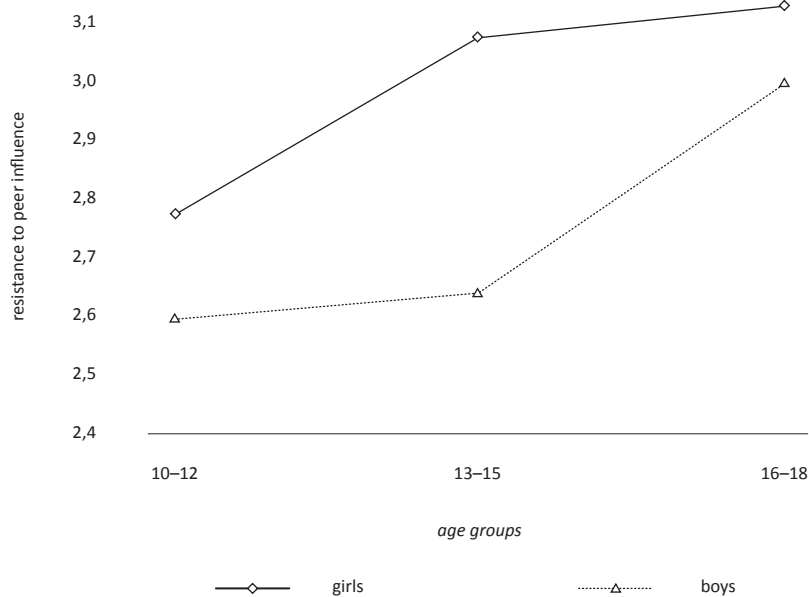


Figure 2. Age and gender differences in resistance to peer influence

## Discussion

In much of the literature on peer influence during adolescence, no clear distinction is made between susceptibility to general or deviant peer influence. Consequently, the assessment of susceptibility to peer influence was often confounded with a willingness to engage in anti-social activities. The Resistance to Peer Influence scale developed by Steinberg and Monahan (2007) seems to provide a solution for this predicament. The scale provides adolescents with neutral situations of peer influence which makes it possible to use the scale to measure a general form of susceptibility to peer influence and to chart its developmental course.

The single-factor structure of the Resistance to Peer Influence Scale, originally developed in an American sample, was cross-validated in the present sample of Dutch children and adolescents aged 10 to 18 years. Although two of the original items (i.e. item 2 and 6) loaded insufficiently on the main factor

and correlated weakly with the total scale, the internal consistency of the full scale was acceptable for all age groups and suggests that the scale can be used successfully with children from age ten. An explanation for the two weaker factor loadings might be that the items (item 2 and 6, see Appendix) were too complex for the younger adolescents. During the classroom assessments, these items also brought about most of the questions and some participants were unclear about their meaning. This could be related to the Dutch language specifically, rather than the content of the items per se. In the studies with the English version this issue did not emerge. Future studies need to determine whether reworded versions of these two items might contribute to the internal consistency of the RPI.

Age and gender differences in self-reported general resistance to peer influence as observed in the present study were as expected. Overall, older adolescents are found to report more resistance to peer influence. Our results show that the development of resistance to peer influence from age 10 to 18 is not curvilinear – with a temporary lapse in resistance during mid-adolescence – as is often reported for resistance to anti-social peer influence. The current findings demonstrate a steady increase in resistance to general peer influence with age. Steinberg and Monahan (2007) found similar age differences using this instrument in a community sample. The range of scores presented in their study are comparable to the ones reported in the current study. However, it seems from the inspection of the data presented by Steinberg and Monahan that in the Dutch sample an increase in reported resistance occurs earlier. The leap in reported resistance from the first (10–12 year olds) to second (13–15 year olds) age group is much less pronounced in the US sample. In the US sample an increase in reported resistance to peer influence occurs from the age of 14 with few changes in the years before. The difference in the timing of the age pattern is something to take note of and needs further research. Overall, these current age patterns in the Dutch and US sample replicate the findings of Walker and Andrade (1996) who used another neutral measure of resistance to peer influence – the Asch experiment – in a broad age range.

From the current findings, Steinberg and Monahan (2007), and the study by Walker and Andrade (1996) evidence seems to emerge that over the course of development adolescents report to be less susceptible to peer influence in



general. This suggests that over time adolescents gain more autonomy from their peers and are able to adhere to their own stance. This new ability can be understood as the result of increasing psychosocial maturity. Psychosocial maturity studies show that teenagers gain more impulse control, responsibility, and self-awareness over the course of adolescence (e.g., Greenberger & Sorensen, 1974; Loevinger, 1993; Weinberger, 1997). These characteristics are likely to lessen the tendency to follow others without thinking. It is possible that increasing maturity might be linked to a decreasing susceptibility to peer influence. Steinberg and Monahan also speculate that the linear increase in resistance they observed might be due to psychosocial maturity: "the growth of resistance to peer influence is a developmental phenomenon bounded by individuation from parents at its onset and by the development of a sense of identity at its conclusion" (2007, p. 24). Thus, in contrast to the curvilinear relationship for deviant peer influence, a consistent decrease might be expected for general peer influence. That is, susceptibility to peer influence as a general disposition is expected to decrease during adolescence.

Research on psychosocial development might also shed some light on the moderate age effects found in this study. Although the effects of age were significant, they were modest. In this study age was used to chart the developmental differences, however age should only be considered as a proxy of development. During adolescence, age and maturity are not as tightly linked as during childhood; the timing and pace of development varies considerably during adolescence (e.g., Westenberg & Gjerde, 1999). It might be that maturity rather than age could be the main explanatory variable during adolescence. Individual differences in the timing and speed of maturity are manifold and age differences might actually be less pronounced during this stage of development. This would mean that psychosocial development might also explain more in susceptibility to peer influence than age during adolescence. Hence, future studies of the development of susceptibility to peer influence should include measures of social maturity to shed more light on this issue.

Concerning gender differences in resistance to peer influence, girls reported more resistance in the current study, especially during the mid adolescent period. For both boys and girls an increase in general resistance to peer influence could be observed with age. The increase in resistance did occur earlier

for girls than for boys. Still for none of them a temporary increase in reported sensitivity to peer influence was present, which would have resulted in a curvilinear relationship.

The current finding that mid-adolescent girls report more resistance to peer influence than their male peers and report more resistance earlier corresponds well with psychosocial maturity research. Studies of psychosocial development during adolescence have found that girls mature faster than boys during mid adolescence, and that the boys catch up with the girls during late adolescence (Cohn, 1991). This may explain the age-by-gender interaction effect observed in the present study: gender differences are present in mid-adolescence and are much smaller during early and late adolescence. Similar age-by-gender interaction effects have been observed in other aspects which are related to psychosocial maturity, such as pro-social development (Eisenberg, Miller, Shell, McNalley, & Shea, 1991). Again, measures of maturity should be included to test this possibility.

The fact that boys reported less resistance to peer influence during mid-adolescence than girls concurs with developmental trajectories of anti-social behaviors for boys. Adolescent limited delinquency is found for both boys and girls, but overall girls show this behavior to a lesser degree (Moffit & Caspi, 2001). It might be that boys engage more in anti-social behavior during mid-adolescence, because they are more likely to give in to peer influence. At the same time boys also reported to be more sensitive to peer influence than girls during late childhood in the current study. However, this difference in sensitivity does not result in gender differences in anti-social behavior. This might be due to the fact that in most families parental monitoring is still quite strong during childhood. For boys, adolescence might prove to be a critical period for developing adolescent-limited anti-social behavior, because of the combination of sensitivity to peer influence and diminishing parental monitoring. Studies of adolescent limited delinquent behavior could further investigate this idea by incorporating a measure of general resistance to peer influence like the RPI in their design.

Some limitations of the current study need to be mentioned as well. One limitation of the current study is that young adults have not been included. Including older participants would also make it possible to observe at what

point during development the increase of resistance to peer pressure stabilizes; a recent report by Steinberg and Monahan (2007) suggests resistance to peer influence reaches adult levels around 18 and does not increase after this age. It is also necessary to include young adults to be sure that the gender gap remains absent from late adolescence onwards. A second limitation of the present study has been to not include a measure of resistance to anti-social peer influence. It would be especially interesting to investigate the degree in which these two constructs are related or distinct. Additionally, these measures can be compared on their predictive value toward engagement in either anti-social or pro-social activities. Many of the studies included in the literature review above have used indirect measures of peer influence in both the anti-social (e.g., Fergusson et al., 2007) as well as a pro-social context (e.g., Robertson et al., 2006). They looked at targeted activities by studying the adolescent's social network. It remains unclear how self-reported susceptibility and effects of certain types of friends are related. Are adolescents who report high susceptibility to peer influence more likely to copy their friends' behavior? Finally, longitudinal data should be collected in order to draw stronger conclusions about the development of resistance to peer influence and underlying constructs, like social maturity.

The current study has shown that a self-report measure of general resistance to peer influence might provide new insights in the development of resistance to peer pressure. Going against popular belief, self-reported resistance to peer influence appears to increase during adolescence. It is important to note that the data presented reflect reports of resistance to peer influence rather than actual behavior, limiting the conclusions that can be drawn from this design. However, Walker and Andrade's (1996) results were based on observed behavior rather than reported resistance and found the same pattern. Future studies should incorporate other measures and use different methodologies to investigate general resistance to peer influence. In addition, the developmental trajectory of resistance to general peer influence might also be compared with resistance to pro-social peer influence. It is still unclear whether pro-social peer influence will follow a similar developmental trajectory. Following the RPI, it would be interesting to develop a measure that focused explicitly on situations of pro-social and positive peer influence.

The availability of a measure of general resistance to peer influence also facilitates the study of many adolescent problem behaviors that are not necessarily delinquent behaviors. Adolescence is also known as a period of risky behavior. Teenage pregnancies, school refusal, conflicts with parents and breaking curfew are all issues that play their part during adolescence. To understand in what degree susceptibility to peer influence might contribute to these activities it is important to use an instrument that does not tap into mainly anti-social activities. Future studies might further investigate the relationship between general resistance to peer influence and these type of behaviors.

In addition, attention should be paid to a possible interaction between age and gender. Doing this might contribute to a better understanding of gender differences in the literature, which have been inconsistent. Although more research is necessary in the area of resistance to peer influence, the current findings suggest that the instrument developed by Steinberg and Monahan (2007) is reliable from the age of 10. This makes it a suitable candidate for future studies of the development of resistance to peer influence independent of anti-social behavior.

Appendix. Resistance to Peer Influence  
Scale (Steinberg & Monahan, 2007)

1	Some people go along with their friends just to keep their friends happy.	but	Other people refuse to go along with their friends want to do, even though they know it will make their friends unhappy.
2	Some people think it's more important to be an individual than to fit in with the crowd.	but	Other people think it is more important to fit in with the crowd than to stand out as an individual.
3	For some people, it's pretty easy for their friends to get them to change their mind.	but	For other people, it's pretty hard for their friends to get them to change their mind.
4	Some people would do something that they knew was wrong just to stay on their friends' good side.	but	Other people would not do something they knew was wrong just to stay on their friends' good side.
5	Some people hide their true opinion from their friends if they think their friends will make fun of them because of it.	but	Other people will say their true opinion in front of their friends, even if they know their friends will make fun of them because of it.
6	Some people will not break the law just because their friends say that they would.	but	Other people would break the law if their friends said that they would break it.

- 
- 7 Some people change the way they act so much when they are with their friends that they wonder who they “really are”. but Other people act the same way when they are alone as they do when they are with their friends.
- 
- 8 Some people take more risks when they are with their friends than they do when they are alone. but Other people act just as risky when they are alone as when they are with their friends.
- 
- 9 Some people say things they don't really believe because they think it will make their friends respect them more. but Other people would not say things they didn't really believe just to get their friends to respect them more.
- 
- 10 Some people think it's better to be an individual even if people will be angry at you for going against the crowd. but Other people think it's better to go along with the crowd than to make people angry at you.
-



## CHAPTER 7

## Summary and Conclusion

The current thesis was written as part of the Social Anxiety and Normal Development study. The main focus of the thesis was to investigate the normative developmental pattern of social fears. For this reason a large sample of 9 to 17 year olds were asked to report on social fears using different questionnaires. In addition to questionnaires a behavioral assessment test was included as well to measure different components related to fear, subjective experience and physiological responses. Because available research indicated that an age related increase might be specific for social evaluative fears, rather than social fears in general (Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004), all participants were exposed to a public speaking stressor specifically designed for the current study.

Furthermore, as age can best be considered a proxy of development, additional measures of development were included in the study (e.g., pubertal, cognitive, and psychosocial development). By including these developmental variables it is possible to understand why some changes occur at a particular age or rather time of development. Note, that it was not possible to study all developmental variables in relation to social fears within the scope of the current thesis. The current thesis was able to assess the relationship between pubertal development and social fears.



## Part I. Growing up to be fearful?

The main question posed in the first three chapters was whether adolescents grow up to be more fearful of social situations. This was studied for distress and avoidance in different social situations (Ch. 2), for subjective nervousness and physical responses in a public speaking task (Ch. 3), and through an assessment of the public speaking experience in general (Ch. 4).

*Chapter 2.* One of the main aims of Chapter 2 was to uncover whether different types of social fears show different developmental patterns. The results of several earlier studies on age differences in social fears were mixed. Following Westenberg et al. (2004) it is suggested that it might be necessary to make a distinction between different social fears, because when no distinction is made the developmental pattern becomes indistinct. Thus, Chapter 2 investigated age differences in reported distress for various social situations.

In addition to distress in social situations in general, situations were categorized in three categories, namely formal speaking and interaction situations (e.g., speaking in public), informal speaking and interaction situations (e.g., parties) and observation by others (e.g., walking in hallways). The study provided evidence that age differences are dependent on the type of situations that are studied. Thus, in line with earlier studies (e.g., Westenberg et al., 2004, Gullone & King, 1993) general levels of distress concerning social situations did not show age related changes, but distress in formal speaking and interaction situations did.

Furthermore, Rapee and Spence suggested that the increase in social phobia prevalence rates might be mainly due to changes in life interference. Interference refers to the effect of experienced distress on youth's functioning and was operationalized as avoidance. To test this assumption Chapter 2 also investigated age differences in avoidance. This was done as follows, participants were asked to indicate whether they avoided or would like to avoid the same social situations as described above. These results partly support Rapee and Spence's suggestion, with increasing age youth reported more avoidance and the age effects were pronounced in comparison to those observed for distress.

In short, Chapter 2 showed that adolescents became more fearful of social situations. At the same time, the findings underlined the need to distinguish

between different types of social fear when studying developmental patterns and to assess avoidance in addition to distress.

*Chapter 3.* To follow-up on the age differences in self-reported social fears, Chapter 3 investigated whether these age differences would translate to increased stress responses during an actual social evaluative stressor, a public speaking task. The paper provided evidence that speaking in public resulted in stronger physical responses as measured by cortisol and alpha-amylase throughout adolescence. In contrast age differences in self-reported nervousness during this task did not emerge. Our results - both the presence of stronger physical responses and the absence of higher levels of reported nervousness - were in line with two recent studies, this is Gunnar, Wewerka, Frenn, Long, and Griggs (2009) and Stroud et al. (2009). These studies however were unable to make a detailed account of age differences, because of relatively small samples.

Notably, the Leiden PST allowed a more detailed investigation of the age differences that were observed. A distinction could be made between age difference in anticipatory responses to the speech and responses as a result of actually giving the speech. As hypothesized, the increase in biological reactivity was most pronounced during the anticipation stage.

Another central element of the current thesis was to investigate developmental variables in addition to age to better understand the normative changes in social fear that are observed during adolescence. Chapter 3 focused on the effect of pubertal development which has often been put forward as an instigator of a time of increased stress sensitivity (e.g., Dahl, 2004, Dahl & Gunnar, 2009). Many studies have looked at puberty in relation to depression and risk behavior (e.g., Angold, Costello, & Worthman, 1998, Steinberg, Dahl, Keiting, Kupfer, Masten, & Pine, 2006), but in relation to social fears only few studies are available. The effects of puberty observed in chapter 3 were in line with age, but not stronger than the age effects.

Although further studies are necessary to study the relationship between puberty and social fears in depth, it is clear that other developmental variables should be studied as well to better understand age differences in social evaluative fears.

*Chapter 4.* In this chapter the public speaking experience during adoles-

cence was studied in more detail. The self-report study (Ch. 2) and the behavioral assessment study (Ch. 3) with the Leiden PST have shown that public speaking situations are particularly distressing. At the same time little is known about how adolescents view these situations. Topics that we still knew little about included: which elements do adolescents think are important, how they expect to be evaluated, and whose opinion they feel is most important? Do they expect to do well; do they have negative thoughts about their performance that haunt them? Thus, Chapter 4 painted a broader picture of public speaking during adolescence

Additional support was presented for an adolescence bound increase in public speaking apprehension. The older adolescents expected to be evaluated more negatively than the younger children. In addition, the older children had less positive and more negative thoughts in the week following the speech. The increase in negative expectations before and negative thoughts after social situations could be a contributing factor to the rise of social fears. However, future studies are needed to test whether there is a relationship between these variables and the direction of causality.

This chapter also assessed more general aspects of the public speaking experience through open-ended questions. The findings showed that although adolescence is a time of increasing autonomy, youth are not insensitive to the opinion of others. For example, the study showed that to decide how well they had performed adolescents used their own impression on how well it went (i.e., comparisons to personal standards), but also took into account feedback they received from the audience (i.e. use of external standards). Furthermore, no age differences were observed in the importance of peer opinion, while their own opinion became more important to them over time.

During adolescence the social field changes and youth might struggle to combine diverse expectations (i.e., their own and those of others) in social situations. Awareness of these diverse expectations might be a reason why adolescents come to report more distress during public speaking. The findings from this chapter and their possible relationships with social fear need to be explored further.

**General conclusion – Part I**

The current thesis has provided support for the main question posed at the beginning of this thesis, this is adolescents seem to grow increasingly more weary of social situations. This increase seems to be specific for social-evaluative situations rather than social situations in general.

An unanticipated finding that emerged from both Chapter 3 (stress reactivity) and 4 (public speaking experience) is the fact that anticipation to social-evaluative situations seems to be particularly sensitive to developmental differences. Developmental differences in physical responses were most pronounced in anticipation to the speech (Ch. 3) and it was only the week before the speech that older subjects reported more negative expectations than their younger counterparts (Ch. 4). It is recommended that future studies of social fear pay particular attention to the feelings of anticipatory fears.

The finding that self-reported nervousness showed no age related increase in Chapter 3 (see also Gunnar et al., 2009, Stroud et al., 2009) is somewhat in contrast with the self-reported trait levels of distress presented in Chapter 2. It is unclear why age differences were present in distress for formal speaking and interaction situations, but not during the assessment of state nervousness during the speech task. This might be linked to the fact that age differences were more pronounced in absence of the stressor (i.e., anticipation). Due to cognitive advances adolescents become more able to worry about abstract ideas than children, whereas when directly confronted with a social evaluative situation this is experienced as equally stressful by children and adolescents. At the same time Chapter 2 also highlighted that it is important how questions are framed, namely effects for avoidance were stronger than for distress. Thus it might be necessary to develop indirect measures for use with the Leiden PST that are more sensitive to developmental differences.

Although most findings seem to indicate that the rise in social fears is specific for social-evaluative situations, future studies would benefit from contrasting the Leiden PST with a social interaction task.

## Part II. Psychosocial Maturity: Instrument Development

Puberty has been thought to be the causal factor for age differences observed in social fears. For this reason the effect of puberty was tested in Chapter 3. However, although puberty was related to increased biological responses during the Leiden PST, the effects were less strong than might be expected. This finding shows that it is necessary to study other developmental variables to understand the normative rise in social-evaluative fears. Psychosocial development might be a prime candidate to research in combination with social fears. Adolescents are thought to become more considerate of others (Caffman & Steinberg, 2000) which would affect decreases in problem behavior, but possible increases in social fear. At the same time adolescents were thought to be particularly sensitive to peer opinion (Steinberg & Silverberg, 1986), creating a vulnerability to social fears.

Instruments had to be developed for use in the SAND study to investigate the relationship between psychosocial development and social fears. An account of those instruments is provided below.

*Chapter 5.* In Chapter 5 the psychometric properties of the Dutch translation of the Self-Restraint Scale (SRS; Weinberger & Schwartz, 1990) were investigated. Self-restraint is considered a central element of the psychosocial maturity model of Caffman and Steinberg (2000), in particular they used impulse control and consideration of others as maturity indices. For the current study the Dutch translation made by Vazsonyi, Pickering, Junger, and Hessing (2001) had to be adapted for use with younger children (9-10 years old). The new Dutch SRS was tested in a separate sample of 481 ten to eighteen year olds. The factor structure of the scale observed in this study differed from the original of Weinberger (1997). A three-factor structure was proposed as a better solution than the four-factor structure in the Dutch sample of youth, aged 10 to 18 years. A distinction was made between suppression of aggression, impulse control and consideration for others. The two maturity indices proposed by Caffman and Steinberg (2000) emerged and can be further investigated. In future research developmental patterns of impulse control and consideration of others will be investigated. In relation to social fears, it might be expected that children who report high levels of consideration of others might be more sensitive to experience social fears.

*Chapter 6.* Another important element of adolescent psychosocial development is the attainment of autonomy, which would result adolescents becoming more resistant to the influence of others. In Chapter 6 psychometric properties and age differences were investigated in relation to the Resistance to Peer Influence scale (RPI). Following the original publication (Steinberg & Monahan, 2007) a one factor structure was confirmed and the reliability of the scale was good. For a long time researchers assumed that sensitivity to peer influence would show an U-shaped developmental pattern, with mid adolescents being most sensitive (Berndt, 1979; Steinberg & Silverberg, 1986). These assumptions were based on studies that did not distinguish between resistance to peer influence in general and in anti-social settings. In contrast to this literature, in the study presented in this paper adolescence did not appear to be a period of temporary increased sensitivity to peer influence. Rather, during adolescence youth became better at resisting peer influence. This finding fits well with existing literature about adolescent psychosocial development and the increase in autonomy.

In addition to the age related increase, the developmental pattern differed between boys and girls. The study showed that girls were ahead of boys in their development, reporting to be more resistant than boys during mid-adolescence. This finding is in line with gender differences observed in ego development. Cohn's meta analysis showed that girls are approximately 2 years ahead of boys and boys catch up at the end of adolescence. The RPI showed a similar maturity gap between boys and girls. A similar finding was presented by Klimstra, Hale III, Raaijmakers, Quinten, Branje, and Meeus (2009) who found that girls were faster than boys in all aspects of personality development.

#### **Development and the emergence of social fears**

Coming back to the original model presented in Chapter 1 it is possible to say something about some of the pathways but not all. For instance, there is a relationship between age and social evaluative fears and a relationship between puberty and social evaluative fears. These relationships were in the expected direction; thus, in answer to the main question posed in this thesis it emerged that social fears increased with increasing development. At the same time, the effect of pubertal development was more modest than expected. Because the

focus of the current thesis was on age and puberty it was not yet possible to study the effects of other developmental variables. As discussed in the introduction, it will be necessary to study the effects of cognitive and psychosocial development.

On the one hand it will be necessary to study the direct effects of these developmental variables on social fears. However, some developmental changes, like increased resistance to peer influence, would more likely effect a decrease in social fears during adolescence. To understand these seemingly modest and possibly contrary effects, it is important to realize that there are variations in the speed of development of different aspects of adolescent development both within and between individuals.

These variations in speed of development are also observed in adolescent brain development. Several researchers have commented on the effect of a mismatch between the development of different brain regions during adolescence (e.g., Nelson, Leibenluft, McClure, & Pine, 2005, Ernst, Pine, & Hardin, 2005, Steinberg, 2005). During adolescence it appears that the limbic structures which are responsible for affective responses develop more quickly than the pre-frontal structures which are responsible for the regulatory functions. As a result adolescents become more vulnerable to different problems, including alcohol abuse, risk taking and emotional disorders (Steinberg, 2005).

This mismatch might also explain the increase in social fears and prevalence of social anxiety disorder; however no studies have investigated this relationship.

To get a complete picture of the role development plays in the increase of social fears, it is important to include a variety of developmental variables. The upcoming longitudinal studies will be able to provide conclusive evidence for the full model presented in Chapter 1. Whereas puberty would result in stronger affective response, it is important to also include variables that can be viewed as indices of the more regulatory capacities that might temper those responses. It can be tested whether discordance between supposedly parallel developmental variables, for instance pubertal development and resistance to peer influence, explains the emergence of social fear during adolescence. These combinations of different developmental variables might be able to explain more variance in social fears than each variable in and of itself.

**The next step: When normative social fears deviate**

Recent developments in the field of adolescent developmental psychopathology have shown that there is a need for interactional models (e.g., Windle et al., 2008, Allen & Sheeber, 2008). Taking into account the individual variation in the timing of different developmental variables as discussed above might in combination with other variables be a risk factor to develop deviant levels of social anxiety. Most models on social anxiety to date focus only on individual differences and do not include development, whereas pathways of social anxiety might be partly determined or depend on development, individuals' environment, genes/temperament, and interactions between all.

There are several important variables to consider in regard to social fears. For example, certain personality characteristics, for example introversion; entry into this developmentally sensitive period might make introverted youth particularly vulnerable to experience social fears during adolescence. This could mean that normative developmental effects might tip the balance for the worse in youth with a particular personality make up.

Similarly, Allen and Sheeber (2008) emphasize the need for cross-disciplinary research to better understand the development of depression during adolescence, for this purpose it is necessary to study "the interaction between environmental factors, individual differences, and biological maturation" (p.342). The tipping point model by Dahl (e.g., Dahl & Hariri, 2005) seems to be sensitive to the complexity of adolescence. This model proposes that there is a precarious balance during adolescence which can be disturbed quite easily by seemingly minor changes.

For example due to the increased importance of peers during adolescence, a supportive environment might be particularly important. Recent studies by Blöte et al. have shown that socially anxious adolescents are treated differently by their classmates (e.g., Blöte, Kint, & Westenberg, 2007, Blöte & Westenberg, 2007). Furthermore, correlations have been observed between social fear and social support (Bokhorst, Blöte, Sumter, & Westenberg, 2009). Although these studies were not able to address causal relationships, it could be expected that when confronted with a negative environment or limited social support the precarious balance of adolescents might be disturbed for the worse would



trigger deviant development of social fears. At the same time perceiving high social support could be particularly beneficial during adolescence.

Thus, the knowledge we have gained about the normative pattern of social fears could be interpreted as a cautionary tale. Most models that have studied the development of social anxiety have focused on individual differences and do not take into account development (e.g., Rapee & Spence, 2004). However, especially during adolescence, individual differences might play their part and lead to the development of social anxiety disorder. For this reason, it is important that future studies investigate the influence of individual difference variables, like temperament and environment, in combination with developmental variables on the developmental pathway of social anxiety.





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## Nederlandse Samenvatting

Dit proefschrift komt voort uit het project Social Anxiety and Normal Development (SAND; Sociale Angst en Normale Ontwikkeling) dat sinds 2004 loopt aan de afdeling Ontwikkelings- en Onderwijspsychologie van de Universiteit Leiden. Het SAND project omvat een longitudinale studie waarbij een groep kinderen en adolescenten over een periode van drie jaar werd gevolgd. Tijdens deze periode werd een groot aantal variabelen in kaart gebracht die mogelijk van belang zijn voor het begrijpen van individuele verschillen in sociale angst (waarom zijn sommige kinderen angstiger dan andere kinderen) en voor het bestuderen van leeftijdsverschillen zoals beschreven in dit proefschrift. Het centrale doel van dit proefschrift is om inzicht te krijgen in de normale ontwikkeling van sociale angst tijdens de adolescentie.

De kinderen en adolescenten die hebben meegedaan aan het onderzoek waren tussen de 9 en 17 jaar oud en hebben naast het invullen van verschillende vragenlijsten ook een spreekbeurt gegeven in een van de SAND onderzoeksruimtes op de universiteit. Tijdens deze spreektaak, genaamd de Leiden PST, werden verschillende metingen gedaan. De taak biedt de mogelijkheid om fysiologische reacties en subjectieve ervaring tijdens een sociaal-evaluatieve situatie vast te leggen. Er is voor een spreektaak gekozen, omdat eerder onderzoek heeft laten zien dat leeftijdsverschillen groter zijn wanneer het gaat om sociaal-evaluatieve angst dan om sociale angst in het algemeen (Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004). Deze taak is dan ook speciaal voor het huidige onderzoek ontwikkeld en de evaluatieve component werd sterk benadrukt.

Leeftijd kan het best worden gezien als een afgeleide indicator van ontwikkeling en niet als een directe maat ervan. Sommige adolescenten zijn al erg volwassen voor hun leeftijd, terwijl andere langer kinderlijk blijven. Daarom is het nodig om bij onderzoek naar ontwikkelingseffecten niet alleen naar leeftijd te kijken maar ook gebruik te maken van meer directe maten van ontwikkeling, bijvoorbeeld lichamelijke, cognitieve en psychosociale indicatoren. In de studies die binnen dit proefschrift werden behandeld is gekozen voor het bestuderen van de rol van lichamelijke ontwikkeling naast die van leeftijd.

Het proefschrift is onderverdeeld in twee delen: hoofdstukken 2 tot 4 brengen in kaart wat het normale ontwikkelingspatroon van sociale angst is en hoofdstukken 5 en 6 doen verslag van instrumentontwikkeling voor toekomstig onderzoek.

## Deel I. Ouder worden, banger worden?

In de eerste drie hoofdstukken werd de vraag gesteld of adolescenten naar mate zij ouder worden ook meer angst ervaren ten aanzien van sociale situaties. Hierbij is gekeken naar zowel naar angstgevoelens als vermijdingsgedrag ten aanzien van sociale situaties (H<sub>2</sub>), naar subjectief ervaren angst en fysiologische reacties tijdens de spreektaak (H<sub>3</sub>), en ook meer globaal naar hoe een spreektaak wordt ervaren door jongeren (H<sub>4</sub>).

HOOFDSTUK 2. Uit eerder onderzoek is gebleken dat leeftijdsverschillen in sociale angst niet altijd even eenduidig zijn. Westenberg et al. (2004) beargumenteerden dat dit mogelijk het gevolg was van te weinig aandacht voor specifieke sociale angsten. Er is daarom in dit hoofdstuk niet alleen gekeken naar angst voor sociale situaties in het algemeen, maar ook voor drie types sociale situaties, namelijk formele sociale en interactiesituaties (bijv., het geven van een spreekbeurt), informele sociale en interactiesituaties (bijv., een feestje), en observatie door anderen (bijv., lopen door de gang). De ontwikkelingspaden bleken te verschillen voor de drie situaties en de resultaten kwamen overeen met die uit eerdere studies (bijv., Westenberg et al., 2004, Gullone & King, 1993). Er werden geen leeftijdsverschillen gevonden voor sociale situaties in het algemeen, terwijl er met toenemende leeftijd wel meer angst werd gerapporteerd ten aanzien van formele situaties.

Adolescenten rapporteerden niet alleen in hoeverre bepaalde situaties hen overstuur maakten, maar ook of zij deze situaties indien mogelijk zouden willen vermijden. Rapee en Spence (2004) stelden namelijk dat de leeftijdstoename in de prevalentie van sociale fobie zou kunnen samenhangen met een grotere interferentie met het dagelijkse leven en niet zo zeer met een toename van angstgevoelens. Vermijding kan worden gezien als een maat van deze interferentie. De resultaten in hoofdstuk 2 lieten inderdaad zien dat de leeftijdsverschillen duidelijker naar voren kwamen in gerapporteerd vermijdingsgedrag dan in gerapporteerde angstgevoelens. Dat wil zeggen, adolescenten bleken wel meer angstgevoelens te ervaren naarmate zij ouder werden, maar in sterkere mate gaven zij aan deze sociale situaties te willen vermijden.

HOOFDSTUK 3. Vervolgens rijst de vraag in hoeverre de toename in gerapporteerde angst en vermijding van formele sociale situaties zoals beschreven in het vorige hoofdstuk, zich verhoudt tot wat er gebeurt in een echte sociale situatie. In hoofdstuk 3 is daarom gekeken naar de leeftijdsverschillen in fysiologische reacties en subjectieve ervaring tijdens een spreektaak. De resultaten kwamen gedeeltelijk overeen met de verwachtingen: de fysiologische reacties (cortisol en alpha amylase) werden inderdaad sterker met leeftijd, maar de subjectieve ervaring van de eigen reactie op de situatie veranderde niet met leeftijd.

De Leiden PST bood de mogelijkheid om leeftijdsverschillen ook in meer detail te bekijken. Er werd gekeken of de leeftijdseffecten anders waren voor anticipatie op de spreekbeurt dan voor het daadwerkelijk geven van de spreekbeurt. Zoals verwacht, was de toename in fysiologische reactiviteit het sterkst tijdens de anticipatiefase.

Naast leeftijd werd ook gekeken naar een mogelijk achterliggende ontwikkelingsvariabele, namelijk puberteit. Het begin van de puberteit wordt in verschillende studies gezien als de oorzaak van een toename in stress sensitiviteit (e.g., Dahl, 2004, Dahl & Gunnar, 2009). In het huidige onderzoek bleek dat met een toenemende lichamelijke ontwikkeling de fysiologische stress reacties tijdens de spreektaak sterker werden. Het effect van puberteit was vrijwel gelijk aan het effect van leeftijd maar niet sterker. Hoewel verdere studies naar de relatie tussen puberteit en stress reacties nog nodig zijn, suggereren de gevonden effecten dat er ook moet worden gekeken naar andere ontwikke-

lingsvariabelen dan lichamelijke ontwikkeling om de toename in stress sensitiviteit te verklaren.

HOOFDSTUK 4. In de twee voorgaande hoofdstukken lieten we zien dat adolescenten naarmate ze oudere worden het spreken in het openbaar als steeds minder prettig ervaren. Zij zouden dit soort situaties liever willen vermijden (H<sub>2</sub>) en zij vertonen sterkere fysiologische stress reacties tijdens deze situaties (H<sub>3</sub>). Er is echter weinig bekend over de reden waarom jongeren dit soort situaties minder prettig gaan vinden en wat zij denken over spreken in het openbaar. Daarom werd er in H<sub>4</sub> gekeken naar verschillende onderwerpen die mogelijk van belang kunnen zijn voor hun ervaring: welke elementen vinden zij belangrijk, hoe verwachten zij geëvalueerd te worden, en wiens mening is voor hen het belangrijkste? Verwachten ze dat ze het goed zullen doen of hebben zij negatieve verwachtingen ten aanzien van hun spreekbeurt? Hoofdstuk 4 schetst dus een breder beeld van het spreken in het openbaar tijdens de adolescentie.

Opnieuw werd ondersteuning gevonden voor het idee dat adolescenten steeds minder enthousiast worden wanneer het gaat om het geven van een spreekbeurt. Zo verwachtten oudere adolescenten negatievere beoordelingen dan jongere deelnemers. Bovendien, hadden de oudere adolescenten minder positieve en meer negatieve gedachtes een week na de spreekbeurt. Deze toename in negatieve verwachtingen en gedachtes na een sociaal evaluatieve situatie zouden kunnen bijdragen aan de toename van sociaal evaluatieve angsten. Toekomstig onderzoek zal moeten toetsen hoe deze variabelen met elkaar samenhangen en wat de richting van causaliteit is.

Naast het invullen van vragenlijsten over hun ervaringen met de spreektaak, werden de kinderen en adolescenten ook kort geïnterviewd. Op basis van dit interview zagen we dat terwijl jongeren steeds autonomer worden, zij niet ongevoelig zijn voor de mening van anderen. Zo bleek dat in situaties waarin jongeren moesten besluiten of zij een goede prestatie hadden afgeleverd, zij niet alleen gebruik maakten van hun eigen ideeën hierover (i.e., een vergelijking met de eigen criteria), maar ook afgingen op de feedback die zij kregen van anderen (i.e., externe criteria). Opvallend genoeg werden er geen leeftijdsverschillen gevonden in hoe belangrijk zij de mening van leeftijdgenoten vonden, maar hun eigen mening werd wel steeds belangrijker.

Tijdens de adolescentie verandert het sociale speelveld en moeten jongeren aan meerdere eisen en verwachtingen voldoen. Zij moeten aan hun eigen eisen voldoen, maar ook aan eisen die worden gesteld door hun leerkrachten, vrienden, en ouders. Het besef dat deze eisen en verwachtingen niet altijd compatibel zijn met elkaar, kan een mogelijke reden zijn waarom adolescenten zich minder prettig voelen tijdens een sociaal evaluatieve situatie zoals het spreken in het openbaar. De bevindingen van dit hoofdstuk en de mogelijke verbanden met sociale angst zullen in toekomstige studies verder onderzocht moeten worden.

#### **Algemene conclusie – deel I**

Het huidige proefschrift biedt ondersteuning voor het punt dat bij aanvang van het onderzoek centraal werd gesteld, namelijk dat adolescenten zich minder prettig lijken te gaan voelen bij sociale situaties. Deze toename lijkt specifiek te gelden voor sociaal evaluatieve situaties, en dus niet voor sociale situaties in het algemeen.

Een opvallende bevinding kwam naar voren in H<sub>3</sub> (stress reactiviteit) en H<sub>4</sub> (ervaring met spreken in het openbaar), namelijk de centrale rol van anticipatie. Zo leek met name anticipatie onderhevig te zijn aan leeftijdsveranderingen. In H<sub>3</sub> zagen we dat de leeftijdseffecten het sterkst waren tijdens de anticipatie fase en in H<sub>4</sub> bleek dat alleen tijdens de week voor de spreekbeurt de oudere deelnemers negatiever waren dan de jongere deelnemers. In toekomstige studies naar de ontwikkeling van sociale angst is het dan ook aan te bevelen om oog te hebben voor anticipatie momenten.

De bevinding, zoals gerapporteerd in H<sub>3</sub>, dat de oudere adolescenten niet aangaven zich meer nerveus te voelen tijdens de spreektaak dan jongere adolescenten lijkt in tegenspraak met de resultaten van H<sub>2</sub>. Het is onduidelijk waarom de leeftijdsverschillen die werden gevonden voor formele sociale en interactie situaties in het laatst genoemde hoofdstuk geen rol lijken te spelen bij gerapporteerde nervositeit tijdens de spreektaak in het lab. Het kan samenhangen met het feit dat leeftijdsverschillen met name duidelijk naar voren komen voor de spreektaak (i.e., anticipatie). Door verbeterde cognitieve vaardigheden zijn oudere adolescenten meer in staat om zich zorgen te maken over



abstracte ideeën dan jongere adolescenten, terwijl wanneer zij geconfronteerd worden met een (concrete) sociaal evaluatieve situatie deze mogelijk dezelfde betekenis heeft voor jongere en oudere adolescenten. De situatie wordt dan, ongeacht de leeftijd van de jongere, als stressvol ervaren. Daarnaast werd in H2 ook benadrukt dat de aspecten van sociale angst waarnaar gevraagd wordt van groot belang zijn. Zo waren de effecten voor vermijdingsgedrag sterker dan voor angstgevoelens. Mogelijk is het nuttig om indirecte maten van subjectieve stress te gebruiken tijdens de Leiden PST die gevoeliger zijn voor ontwikkelingseffecten.

Hoewel de meeste bevindingen lijken te ondersteunen dat een toename in sociale angst met name geldt voor sociaal evaluatieve situaties, zal toekomstig onderzoek baat hebben bij het contrasteren van de Leiden PST met een sociale interactie taak. Dit maakt het mogelijk om te zien of de gevonden effecten specifiek zien voor sociaal evaluatieve situaties.

## Deel II. Psychosociale Rijping: instrument ontwikkeling

Omdat van puberteit wordt gedacht dat het de drijvende kracht is achter de leeftijdsverschillen die gevonden worden binnen sociale angst, werd in H3 onderzoek gerapporteerd naar de rol van puberteit. Hoewel puberteit wel gerelateerd bleek te zijn aan de fysiologische stress reacties tijdens de Leiden PST, bleken de effecten minder uitgesproken dan verwacht. Deze bevinding geeft aan dat het noodzakelijk is om meerdere ontwikkelingsvariabelen te onderzoeken om de normale ontwikkeling van sociale angst te kunnen begrijpen. Psychosociale rijping is misschien een goed startpunt voor verder onderzoek. Van adolescenten is onder andere bekend dat zij meer rekening gaan houden met anderen (Cauffman & Steinberg, 2000). Aan de ene kant draagt deze ontwikkeling bij aan een afname van probleemgedrag, aan de andere kant is het mogelijk dat deze ontwikkeling ook bijdraagt aan een toename van sociale angst. Bovendien werd aangenomen dat juist tijdens de adolescentie er sprake was van een verhoogde gevoeligheid voor de mening van anderen (Steinberg & Silverberg, 1986).

Voor de SAND studie werden verschillende instrumenten vertaald en ontwikkeld zodat de relatie tussen psychosociale rijping en sociale angst kon worden bestudeerd. In de onderstaande paragrafen worden twee instrumenten belicht.

HOOFDSTUK 5. De psychometrische kenmerken van de naar het Nederlands vertaalde 'Self-Restraint' (hierna genoemd zelfcontrole) vragenlijst (Weinberger & Schwartz, 1990) werden in H5 besproken. Zelfcontrole is een belangrijk onderdeel van psychosociale rijping binnen het model van Cauffman en Steinberg (2000), met name impulscontrole en rekening houden met anderen werden gezien als rijpingsmaten. Binnen de huidige studie werd de Nederlandse vertaling van Vazsonyi, Pickering, Junger, en Hessing (2001) aangepast voor gebruik bij jongere kinderen (9-10 jaar). Deze lijst werd afgenomen bij 481 jongeren tussen de 9 en 18 jaar. De factorstructuur van de schaal was niet gelijk aan de originele structuur van Weinberger (1997). Binnen de Nederlandse sample bleek een 3-factor oplossing beter dan een 4-factor oplossing. Er kon onderscheid worden gemaakt tussen onderdrukken van agressie, impuls controle en rekening houden met anderen. Aangezien de twee belangrijkste elementen van het model van Cauffman en Steinberg (2000) naar voren kwamen, kunnen deze aspecten in toekomstige studies onderzocht worden in relatie tot sociale angst. Hierbij wordt verwacht dat adolescenten die aangeven meer rekening te houden met anderen, ook gevoeliger zijn voor het ervaren van sociale angst.

HOOFDSTUK 6. Een ander belangrijk onderdeel van psychosociale rijping is het ontwikkelen van autonomie. Deze vaardigheid maakt dat een adolescent beter in staat is weerstand te bieden aan de invloed van anderen. In H6 werden de psychometrische kenmerken onderzocht van de Resistance to Peer Influence scale (RPI). Daarnaast werd ook gekeken naar leeftijdseffecten op deze schaal. In navolging van de originele publicatie (Steinberg & Monahan, 2007) kwam duidelijk één factor naar voren.

Lange tijd werd aangenomen dat gevoeligheid voor de druk van leeftijdsgenoten een U-vormig ontwikkelingspatroon volgde, waarbij tijdens de midden adolescentie de gevoeligheid piekte (Berndt, 1979; Steinberg & Silverberg, 1986). Deze aannames waren gebaseerd op studies die geen onderscheid maakten tussen algemene en anti-sociale invloeden. In tegenstelling tot deze literatuur, bleek in H6 dat er geen sprake was van een tijdelijke piek in deze gevoeligheid. De adolescentie bleek juist een periode waarin de jongeren steeds beter werden in het bieden van weerstand. Deze bevinding sluit goed aan bij de bestaande literatuur op het gebied van psychosociale rijping en de ontwikkeling van autonomie.

Naast de leeftijdsgerelateerde toename, bleek het ontwikkelingspatroon ook te verschillen voor jongens en meisjes. Meisjes liepen voor in hun ontwikkeling op jongens, zij rapporteerden minder gevoeligheid tijdens de middenadolescentie dan jongens. Deze bevinding strookt met de sekseverschillen die voor ego-ontwikkeling werden gevonden in de meta-analyse van Cohn (1991). De meta-analyse liet zien dat meisjes ongeveer twee jaar voorliepen op de jongens en dat de jongens tijdens de late adolescentie een inhaalslag maakten. Een soortgelijk resultaat werd gerapporteerd door Klimstra et al. (2009) die aangaven dat meisjes sneller waren in persoonlijkheidsontwikkeling dan jongens.

#### **Ontwikkeling en de opkomst van sociale angsten**

Met betrekking tot het model dat in de introductie van dit proefschrift (blz 13) werd gepresenteerd, kunnen er op grond van het huidige onderzoek uitspraken worden gedaan over gedeeltes van het model. Bijvoorbeeld, er is een relatie tussen leeftijd en sociaal evaluatieve angst en ook tussen puberteit en sociaal evaluatieve angst. De verbanden waren in overeenstemming met onze verwachtingen en geven weer dat sociale angsten toenemen met voortschrijdende ontwikkeling. Aangezien de nadruk van het huidige proefschrift lag op de effecten van leeftijd en puberteit op sociale angst was het niet mogelijk om te kijken naar andere ontwikkelingsvariabelen. Zoals aan het begin van dit proefschrift reeds werd gemeld zal toekomstig onderzoek zich moeten richten op de effecten van andere rijpingsmaten, zoals cognitieve en psychosociale rijping.

## Curriculum Vitae

Sindy Sumter was born on June 4th 1979 in Amsterdam, The Netherlands. She received her high school diploma from the Hervormd Lyceum Zuid, Amsterdam. In 1997 she started her psychology degree at the Vrije Universiteit, Amsterdam and specialized in social psychology. Following her graduation in 2002 she completed the Masters program Culture, Science and Technology at the Media & Communications department of Goldsmiths, University of London. After working as a research assistant at CancerBACUP (now MacMillan) for a year, she started her PhD at Leiden University's developmental psychology department. As of January 2010 she is a post-doc researcher at the Center of Research on Children, Adolescents, and the Media (CcaM) of the University of Amsterdam researching cyber-bullying among children and adolescents.

