Braver together: an exploration into the effectiveness of blended group cognitive behavior therapy as early intervention for socially anxious adolescents

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Chapter 1

General Introduction

A Typical Case of Social Anxiety Disorder: The Story of Annabel

Annabel is a 16-year-old girl, attending the highest education level of secondary school in the Netherlands. As a child, Annabel was always described as calm and polite. She was shy around strangers but had two best friends at school with whom she shared everything. She had a beloved primary school teacher who knew her well, and Annabel found learning easy. When Annabel turned 12, she started secondary school. Annabel's two best friends went to a different school, and so Annabel found herself in a class with new classmates and several new teachers. While she made attempts to talk to her new classmates, she found it scary and didn't know what to say. Feeling lonely, she missed her previous school, teacher, and friends. When she was 13, she joined a field hockey team in the hope of making new friends but found she was too nervous to stay and chat with the other girls after practice. Annabel found herself constantly worrying about different things. At night, she would lie awake in bed and worry about going to school the next day: what if all her classmates thought she was a loser, what if she had to sit alone at lunch, what if she never made any best friends again? She used to find school a breeze but now Annabel had a hard time concentrating in class because she was constantly worried the teacher might call on her to answer a question in front of the entire class. In class, she was quiet and caused no issues for her teachers. She had several teachers and no one seemed to notice how Annabel was doing. While Annabel was struggling, she did not know how to ask for help from her teachers and did not dare to speak to her parents about it for fear of letting them down. She continued to struggle in silence for several years.

At 16, Annabel's grades were dropping to a point of failing the year and she felt sad most of the time. She was starting to wonder about the point of being alive. Annabel found it more and more difficult to go to school. She started to complain about stomach aches and her parents, who knew Annabel to be an honest and sensible girl, let her stay at home from school. When she had missed school for more than two weeks, her parents took her to the family practitioner who couldn't find a medical reason for her stomach aches. On a return visit to the family practitioner, she was referred to a local mental health clinic, where they established social anxiety disorder with comorbid depression, and offered her treatment.

Social anxiety disorder (SAD) is a marked fear of social situations in which the individual may be scrutinized and negatively evaluated by others. In young people, the anxiety extends to settings with peers (American Psychiatric Association, 2022). Examples of situations include meeting new people, having conversations with classmates, talking to someone on the phone, or giving a speech in front of the class. Social anxiety disorder is a highly persistent disorder with consistently lower remission rates than other anxiety disorders (Evans et al., 2021; Hudson et al., 2015a). SAD has its onset during adolescence, making this developmental phase a key period to intervene. Yet, social anxiety disorder is often only recognized several years into the development of the disorder, when additional problems have manifested, leading to a more complex clinical presentation and, consequently, to a more complex treatment. As a consequence, social anxiety disorder is notoriously hard to treat. Thus, early intervention is crucial to avoid the downward spiral experienced by many adolescents with social anxiety disorder, as in the case of 16-year-old Annabel. While Annabel may be fictional, she represents a typical case of an adolescent with SAD. Such adolescents were the inspiration for this project.

The primary aim of this dissertation was to study the effect of early intervention for adolescents with SAD. In an effort to boost effectiveness, our second aim was to investigate the potential benefits of a blended CBT approach: for internalizing disorders in general but also for adolescent social anxiety disorder. To support these aims, we implemented early intervention blended CBT for adolescents with clinical levels of SAD, recruited from secondary schools. We studied changes from before to after treatment in clinical levels of SAD and in secondary outcomes including self-perception, public speaking anxiety, depression, and social threat cognitions. In addition, we investigated to what extent changes in behavioral (eye-gaze, speech disruptions) and cognitive (audience perception) variables specifically relevant to the context of a public speaking task occurred from before to after therapy. To the best of our knowledge, ours is the first study to do so.

Additionally, we explored the potential benefits of a blended CBT approach through a meta-analysis on available literature using a blended CBT approach to treat anxiety and depression. This study added to available literature by presenting the results of anxiety and depression separately and, crucially, by differentiating between blended approaches (supplemental and replacement). Further, we investigated to what extent mHealth use moderated the treatment effect in our own blended CBT for socially anxious adolescents.

Adolescence in Focus

Social anxiety disorder has the highest incidence rate in late childhood and adolescence, between the ages of 10 and 19 years (Beesdo et al., 2007) with a prevalence of 4% in ages 14-17 and 7.3% in ages 14-24 (Wittchen et al., 1999). Development of social anxiety disorder is a complex interplay of etiological factors including genetic, biological and temperamental influences but also parental and peer relationships, as well as adverse life events (Spence & Rapee, 2016). Unlike other anxieties which have a greater likelihood to develop throughout the lifespan (e.g., generalized anxiety disorder), SAD typically develops during adolescence within a narrower age range (Kessler et al., 2005). This makes adolescence a core developmental period in which to employ early intervention (Beesdo-Baum et al., 2012). In line with this, the present study targeted a crucial phase within adolescence, namely when starting secondary school. Within the Dutch educational system, children typically enter secondary school at 12 years of age. Starting secondary school presents new challenges to young adolescents (Ghoul et al., 2013). It is a moment of change in many aspects of the young students' lives: academically, socially, emotionally, and biologically. This can be particularly difficult and frightening for socially anxious adolescents who are faced with the potentially confronting tasks of adjusting to a new social environment and making new friends (Vernberg et al., 2006).

Parallel to starting secondary school, transition into adolescence is a time marked by great developmental changes. While coping with the joys and horrors of a changing pubescent body, adolescents are also subject to changes in their neurocognitive functioning. Compared to when they were children, typically maturing adolescents finds themselves with a decreased level of fears of punishment and physical harm but also with an increase in social and evaluative fears, explained by their developing sociocognitive maturity (Westenberg et al., 2004) partially driven by puberty (van den Bos et al., 2014; van den Bos et al., 2016). As the importance of relationships with peers and romantic interests greatly intensifies, so does the importance of the opinion of others.

While most peer interactions remain generally positive, there is an increase in negative interactions from peers in adolescence (Furman et al., 2009). The development of a higher sensitivity to negative evaluation by others, along with a greater chance of being socially scrutinized, can lead to an increase in social anxiety (Blöte et al., 2015). As explained by Albano and colleagues, "[w]ith increasing ability to understand the complexities of social interaction and to develop negative self-focused attention, the older child becomes capable of fearing negative evaluation from others" (1995, p. 389). Along with higher risk of negative interactions, stress responsivity to social stressors, such as performing a public speaking task, also changes throughout puberty.

Adolescence is also a time in which social fears may become more debilitating due to new challenges that may not have existed or had as great of an impact during childhood (Bokhorst & Westenberg, 2011). An example of new challenges that arise is that while playdates may have been arranged for a child in primary school, adolescents in secondary school are expected to approach and socialize with friends without much adult help. Another new challenge may be the requirement to give a speech to pass a school subject; this may have been possible to renegotiate or avoid altogether during childhood. Public speaking is a moment of potential scrutiny and judgement by others, and is one of the most commonly feared social situations among socially anxious adolescents (Rao et al., 2007). Socially anxious adolescents have shown negative biases about their own performance but they can also hold skewed assumptions about how negatively their audience views them (Blöte et al., 2014). An overly negative audience perception, whether real or imagined, may exacerbate anxiety levels, thereby prompting more negative cognitions and leading to a poorer performance, in turn eliciting negative treatment from classmates (Miers & Masia Warner, 2023). Hence, while the transition from childhood into adolescence can be demanding for any teen, it can be made especially difficult with the addition of high levels of social anxiety.

A Need for Early Intervention

Social anxiety disorder is often mistaken as typical shyness, rather than as a disorder (Coles et al., 2016; Keller, 2003). Despite symptoms often developing during childhood (Beidel, 1998), and the disorder having an average age of onset of 13 years (APA, 2022), it often goes unnoticed for several years, such as in the case of Annabel, until the severity has reached observable consequences such as poor academic performance or school refusal (García-López et al., 2015). This oversight is likely because shyness is a normal and generally accepted trait within society (Albano et al., 1995). Moreover, socially anxious students do not cause any trouble for teachers or fellow students in the classroom, thus they are not identified at early stages like children with externalizing disorders tend to be (Zarger & Brendan, 2016). Adolescents themselves may also have poor recognition of symptoms and their negative impact (Coles et al., 2016; Furnham et al., 2014) or a reluctance to admit struggling (Aune et al., 2023).

At home, it is difficult for parents to detect anxiety disorders. Adolescents are unlikely to share their internal states with parents (Jensen et al., 1999) and the social support of adolescents generally shifts from parents to peers. Moreover, adolescents spend less time with their parents and conflicts become more likely (Wittchen et al., 1999). Unless the consequences of the anxiety symptoms have a negative impact on family or academic functioning, the parents may not notice and so they are unlikely to seek help (Teagle,

2002). In other words, the adolescent suffers in silence. Complicating the matter further, SAD is passed on within families with an estimated heritability of 56% (Isomura et al., 2015). Thus, parents themselves may be reluctant to seek help even if they recognize the symptoms. These factors combined mean that, despite the accompanying impairment, adolescent SAD largely goes unnoticed and untreated.

Unless treated effectively, the natural course of SAD is highly persistent, with an average duration of 23-29 years (Chartier et al., 1998; DeWit et al., 1999; Wittchen et al., 2000). Prognosis is poor, with prospective studies showing that over the course of ten years, more than half of young people with SAD still have symptoms and only 15% reach remission (Beesdo-Baum et al., 2012). The previously discussed reluctance to seek treatment could explain why SAD has a long course and is often only detected once associated with a comorbid disorder (Kessler et al., 1999). Indeed, 50-90% of patients with SAD present with a comorbidity (Keller, 2003; Koyuncu et al., 2019).

The most common comorbidities include other anxiety disorders, depression, and alcohol abuse. Untreated SAD is often a precursor, and even a risk factor, for the development of comorbidities (Kessler et al., 1999; Koyuncu et al., 2019; Ohayon & Schatzberg, 2010; Oliveira et al., 2018; Stein et al., 2001). The presence of SAD makes a comorbid depression more difficult to treat (Kessler et al., 1999; Stein et al., 2001). This combination has a worse prognosis for adolescents and young adults through higher likelihood of persistent depression and of attempted suicide (Stein et al., 2001). Kessler and colleagues (1999) showed that comorbid depression most often develops while SAD is active as opposed to in remission, suggesting that providing early treatment when only SAD is present is a crucial preventative step in the onset of mood disorders. Consequentially, there are substantial potential gains from early intervention for SAD.

Previous Research on Interventions for Adolescent Social Anxiety Disorder

Cognitive behavior therapy (CBT) is considered "the gold-standard psychosocial intervention for anxiety disorders in children and adolescents" (Bry et al., 2017, pp.2) and is the most commonly used method for treating social anxiety disorder (Wersebe et al., 2013). The majority of research on the treatment of social anxiety disorder has utilized interventions developed for anxiety in general and not for social anxiety specifically (Kashdan & Herbert, 2001). Examples of the most researched CBT anxiety programs include Coping Cat (Kendall et al., 1990), MY FRIENDS (Barrett et al., 2010) and Cool Kids (Lyneham et al., 2003; Rapee et al., 2019). While these

interventions have shown to be effective in treating most anxieties such as separation anxiety and generalized anxiety disorder, individuals with SAD consistently show the lowest improvement (Arendt et al., 2016; Bruce et al., 2005; Evans et al., 2021; Hudson et al., 2015a; Shortt et al., 2001). In a large international study involving 11 sites in different Western countries, a combined total of 1,519 children ages 5-18 received CBT (Hudson et al., 2015b). The researchers found that, despite the therapy showing fairly promising results for other anxiety disorders (40% post-treatment, 56% at follow-up), participants with social anxiety disorder had significantly poorer treatment outcomes with remission rates at half that of other disorders (22.3% at post-treatment, 30.7% at follow up). This difference was not explained by comorbid depression, initial severity, age, or parental psychopathology.

The lower treatment effect for socially anxious youth using generic CBT programs seems to indicate that an intervention focusing on anxiety in general does not sufficiently target the social problem areas experienced in social anxiety. It could also point towards social anxiety's persistence; whereby perhaps more intensive interventions are required to alleviate symptoms. Hence, a program tailored to social anxiety disorder may be necessary.

Indeed, in their meta-analysis on CBT treatment for children and adolescents with different anxiety disorders, Reynolds et al. (2012) found generic CBT had moderate effect sizes (ES = 0.53) whereas disorder-specific treatment programs had medium to large effect sizes (ES = 0.77). In an RCT (randomized controlled trial) performed in a clinic, Rapee et al. (2023) compared the transdiagnostic anxiety intervention Cool Kids to a SAD-specific adaptation of Cool Kids. At follow-up, 52.1% of participants in the transdiagnostic treatment were in remission compared to 68.8% in the SAD-specific treatment.

In a more specific meta-analysis that only included studies with disorder-specific CBT for socially anxious children and adolescents, Scaini and colleagues (2016) found large overall effect sizes (ES = 0.99) for primary outcome measures between pre- and post-tests, and moderate to large effect sizes (ES = 0.71) when comparing a treatment group with waitlist control condition. The researchers found number of treatment sessions to have a significant moderating effect, with more sessions leading to greater effectiveness. An overall large effect size indicates that disorder-specific treatment is beneficial for this population. Notably, within the included studies, they found very large effect sizes for treatment carried out in schools (ES = 1.55) rather than in clinics (ES = 0.67). While this difference may be due to the greater generalizability of the treatment in school settings, Scaini and et al. (2016) discussed that it is most likely due to treatments at school being offered as early intervention, targeting participants with milder impairment who

are perhaps also a bit younger. Indeed, they found a correlation between school setting and sample mean age. We can further speculate that the clinical populations, on the other hand, may present with greater impairment and more comorbidities. The considerable difference in effect between school and clinical studies underscores the potential success of early intervention.

Effective Treatment Components for Social Anxiety

Treatments developed specifically for socially anxious children and adolescents are often derived or "downloaded" from treatment programs targeting adults (Gallagher et al., 2004). There are, however, certain components that have been found to be effective in treating socially anxious youth, and which therefore constituted a general criteria list for the intervention program chosen for this study. First, delivering support in a *group format* gives an advantage to socially anxious adolescents because other group members can offer support and help identify maladaptive thoughts (Masia Warner et al., 2005), as well as offer a safe interaction context in which to practice new skills and cognitions (McLellan et al., 2015).

Second, effective CBT protocols include an element of *cognitive restructuring*: targeting biases by challenging unhelpful thoughts and altering them into more realistic thoughts (McLellan et al., 2015; Mobach et al., 2023). Third, a key component was *in vivo exposure* (Heimberg, 2002; McLellan et al., 2015; Peris et al., 2015): the gradual exposure to threatening stimuli. It should also be noted that for socially anxious individuals, attending group therapy is in itself a form of exposure training: participation in a group format can be an effective manner to provoke anxiety while gradually allowing the adolescents to get used to feelings of anxiety (Gould et al., 1997; Herbert et al., 2009). Exposure is rarely a standalone feature but is offered in combination with cognitive restructuring (Magee et al., 2009; McLellan et al., 2015).

Fourth, it is also important that an intervention includes *social skills training* as this has shown to enhance treatment effectiveness (Herbert et al., 2005; Scaini et al., 2016). The most common social skills deficits found in socially anxious youth are difficulties with eye-contact, initiation and maintenance of conversations, listening skills, speech length, voice volume, and assertiveness (McLellan et al., 2015). Effectiveness of therapy is often studied through the lens of remission rates on a global impairment scale but we still have much to learn about effects of therapy on a detailed level, such as on specific behavioral markers of anxiety. The potential effect of CBT on these behavioral markers of SAD is an important area of study as these may elicit negative feedback from others

and can thus play a role in the maintenance of the disorder (Leigh et al., 2021; Leigh & Clark, 2018; Miers & Masia Warner, 2023).

Even when protocols use most of these effective treatment ingredients, remission rates among socially anxious populations remain lower than other anxious populations. To augment these treatment effects, some clinicians and researchers have started to implement access to a virtual treatment platform, in the hope that additional treatment channels may lead to greater improvement.

Blended Care

Remote forms of therapy dissemination (telephone, email, internet-based programs) have existed for some time now. The newest of these potential therapy channels, dominating in its use of web-based access, is the smartphone (Luxton et al., 2011). The increased use of smartphones transcends socioeconomic status, age, ethnicity, and geographical location, which means wide accessibility and great potential for new treatment protocols (Jones et al., 2015). Mobile health has given rise to a new term: *mHealth*, referring to the use of any type of mobile device for the purpose of providing medical or psychological support on devices such as tablets and smartphones (Abebe et al., 2013).

The practice of combining face-to-face therapy with support from a virtual mHealth channel is called *blended care* and has been described as "the best of both worlds" (Wentzel et al., 2016, p.1). There are particular potential benefits associated with employing blended care in an anxious adolescent population. For example, self-monitoring, thought to be a crucial ingredient in the effectiveness of CBT for adolescents, can be enhanced in mHealth structures through systematic feedback that promotes coping skills (Berry & Lai, 2014). Another mHealth feature that may be of particular advantage to a socially anxious population is the accessibility of contact with the therapist. Not only does this increase convenience for both parties (Anderson et al., 2005; Andersson & Titov, 2014), but it may also reduce the threshold for communication. Thus, the disorder-specific fears of social interaction involved in meeting and speaking with a therapist may abate (King & Poulos, 1998; Budman, 2000).

There is limited research on the effectiveness of blended care for anxiety. The few studies that exist show potential for its effectiveness in adults (Kenter et al., 2015; Månsson et al., 2013). Evidence for its effectiveness in the treatment of anxious youth is even more limited. Pramana and colleagues (2014) developed an mHealth app for childhood anxiety and conducted a pilot study involving nine 9-14-year-old youth,

combining the mHealth app with a brief 8-session CBT treatment. The researchers concluded that, though preliminary, the combination may be of similar effectiveness in producing a reduction in anxiety symptoms as regular CBT treatments. They also stated that a blended method of treatment may lead to more cost-effective healthcare, better dissemination, more involvement in treatment, and faster relief of symptoms. At the outset of this project the effectiveness of blended CBT among a socially anxious adolescent population had not yet been studied, and has, to the best of our knowledge, still not been investigated. Research into the potential added effect of blended care for social anxiety disorder can be of particular importance given its resistance to treatment (Mululo et al., 2012).

The Current Study: *In Je Sas!*

Research has shown that social anxiety disorder is a highly persistent disorder with consistently lower remission rates than other anxiety disorders. Its onset in adolescence makes this developmental phase a key period during which to intervene. We were concerned about adolescents with social anxiety disorder receiving help only several years into the development of the disorder. At that point, additional problems have manifested, leading to a more complex clinical presentation and, consequently, to a more complex treatment. Thus, we considered early intervention to be crucial. Against this backdrop, this dissertation focuses on the effectiveness of an early intervention for socially anxious adolescents at reducing symptoms, and its potential effect on behavioral markers. Second it explores the potential benefits of blended care in treating internalizing disorders, as a way to make treatment more effective.

In the process of choosing the most appropriate treatment protocol to suit our two aims, we were guided by the previously-mentioned criteria. We compared and contrasted all available treatment protocols, including Cool Kids, Social Effectiveness Therapy for Children (SET-C), FRIENDS, Denken Durven Doen, and more. We also communicated and consulted with the creators of some of these programs, and considered the attributes of each. We chose an effective treatment protocol that satisfied our previously-mentioned criteria of cognitive restructuring, exposure exercises, social skills training, assertiveness training, while in a group format, namely *Skills for Academic and Social Success* (SASS; Masia Warner et al., 2018). It was designed for early intervention with a socially anxious adolescent population, and was thus considered to be the most complete protocol to suit our aims. The disorder-specific nature of the program meant it was tailored to address the anxieties and cognitions experienced in social situations, with commonly feared social situations as in vivo exposure exercises, and with social

skills as a central component. Intriguingly, SASS had never been tested in the Netherlands before.

However, there was clearly a need for an early intervention program in the Netherlands. Consultations at an academic center for child and adolescent psychiatry confirmed that the treatment gap reported in literature is also observed in practice. The delay in treatment means that many adolescents and young adults with social anxiety disorder have comorbid depression requiring clinicians' immediate attention. Patients first receive individual therapy for depression and social anxiety disorder and only after this would they be deemed ready to enter a group therapy for social anxiety disorder. At that point, groups are reportedly difficult to fill.

In our recruitment, we circumvented the traditional route of the Dutch healthcare system, consisting of a family vising their family practitioner and from there being referred to a mental health clinic (Zwaanswijk et al., 2025), by recruiting adolescents via schools. Targeting adolescents and their parents directly via schools was a crucial step in reaching socially anxious adolescents early in the prognosis of the disorder. By recruiting via an electronic flyer sent by the school counselor to all parents of a school, we were able to reach most parents, increasing the chances of a high uptake. On the flyer, we used low-threshold terminology, substituting clinical terms such as "treatment" and "social anxiety disorder" with more accessible terms such as "program" and "very shy." To target impairment, we gave concrete examples such as difficulty making new friends and speaking in front of the class. From a recruitment effort such as this, we expected that we could intervene at a moment when symptoms and clinical impairment were present but without severe comorbidities. For Annabel, it may have meant she would have received recognition and help much sooner. We coined our project *In Je Sas!,* a common Dutch expression. While there is no direct English translation, to be 'in je sas' means to be joyful, happy or excited, and to be pleased with the way things are. The title was a nod to the original English abbreviation of the treatment protocol, SASS, while highlighting the aim of the program to our potential participants, which was to feel content.

In addition to translating the entire protocol and worksheets into Dutch, we made three notable adjustments to SASS: first, we conducted the therapy in a clinic rather than in a school setting. This allowed us to include adolescents from several different schools into the same group in an equally unfamiliar setting, and allowed us to expand the sessions' duration beyond the duration of a school lesson. Second, we made the decision to exclude the use of prosocial peer events. Prosocial peer events are organized social gatherings between non-anxious socially skilled adolescents and SASS participants at, for example, a bowling alley. These events were excluded owing to the under-

taking of recruiting prosocial peers and arranging these being deemed too impractical at that time. Thirdly, to explore the potential added benefits of a blended protocol, we incorporated an adolescent-friendly CBT-oriented platform that could be accessed via a smartphone app. We considered two available mHealth apps *Luca* and *Jouw Omgeving*. We selected the latter because it satisfied our criteria of being CBT-focused and providing a chat option. Moreover, it was an already established and fully operational mHealth platform, in use by some of the largest mental healthcare organizations in the Netherlands. The programmers at *Jouw Omgeving* designed a system that allowed us to collect usage data.

Outline and Objectives

The present dissertation had the primary aim of studying the effect of an early intervention approach for socially anxious adolescents. The secondary aim was to enhance our understanding of the potential benefits of a blended approach. **Chapter 2** describes a meta-analysis about the effectiveness of using blended CBT in different forms to treat anxiety and depression for all ages. **Chapter 3** reports on the findings of our own effectiveness study, using a blended group CBT approach at an early intervention stage to treat adolescents with social anxiety disorder. The same chapter also investigates the moderating effect of the use of an added mHealth component on the outcome of our treatment. **Chapter 4** explores the potential effects of our intervention on specific behavioral markers of social anxiety during a public speaking task. This chapter adds to our first aim by expanding our understanding of areas of change - from symptoms to behavior - as an effect of treatment. **Chapter 5** builds on the public speaking task reported in Chapter 4 by investigating to what extent the cognitive bias reducing effects of therapy can transfer to a real-life context such as public speaking by investigating audience perception in socially anxious adolescents. **Chapter 6** summarizes our findings and discusses the clinical implications, as well as giving directions for future research.

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