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Treating Speech Anxiety in Youth: A Randomized Controlled Microtrial Testing the Efficacy of Exposure Only Versus Exposure Combined With Anxiety Management Strategies

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CBT for anxious youth usually combines anxiety management strategies (AMS) with exposure, with exposure assumed to be critical for treatment success. To limit therapy time while retaining effectiveness, one might optimize CBT by restricting treatment to necessary components. This study tested whether devoting all sessions to exposure is more effective in reducing speech anxiety in youth than devoting half to AMS including cognitive or relaxation strategies and half to exposure. After a 6-week waitlist period, adolescents with speech anxiety (N = 65; age 12–15; 42 girls) were randomized to a 5-session in-school group-based CBT training consisting of either (1) exposure-only (EXP+EXP) or (2) cognitive strategies followed by exposure (COG+EXP) or (3) relaxation strategies followed by exposure (REL+EXP). Clinical interviews, speech tests, and self-report measures were assessed at pretest, posttest, and follow-up. For all conditions (a) the intervention period resulted in a stronger decline of speech anxiety than waitlist period; (b) there was a large sized reduction of speech anxiety that was maintained at six-week follow-up; (c) there was no meaningful difference in the efficacy of EXP+EXP versus COG+EXP or REL+EXP. These findings suggest that devoting all sessions to exposure is not more effective than combining exposure with AMS. AMS appeared neither necessary for CBT to be effective, nor necessary for youth to tolerate exposure. This indicates that CBT can be optimized by restricting treatment to exposure.

Keywords: speech anxiety; youth; exposure; cognitive; relaxation

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ANXIETY DISORDERS are the most common type of mental disorders in youth, with a worldwide prevalence of 6.5% (Polanczyk et al., 2015) and a lifetime prevalence of 28% in youth aged up to 19 (Ormel et al., 2015). Social anxiety disorder or social phobia (SoP) is one of the most prevalent anxiety disorders in youth. SoP is characterized by excessive fear or anxiety about one or more social situations in which the individual is exposed to possible scrutiny by others (APA, 2013). SoP is associated with having anxious thoughts and anxious bodily feelings, and showing anxious actions like avoidance of social situations (Lang, 1971). The DSM-5 differentiates between generalized SoP and SoP restricted to speaking or performing in public (i.e., speech anxiety). Speech anxiety (SA) is the most common form of SoP and will be the focus of the current study. Untreated, SA interferes with youths' social, emotional, and academic development, and could lead to a variety of comorbid disorders and persistence into adulthood (Rapee et al., 2009). Therefore, treatment of SA should ideally occur as early as possible to avoid prolonged suffering and the likely progression to other disorders.

Exposure-based cognitive behavioral therapy (CBT) has been established as an empirically supported treatment for childhood anxiety disorders (CADs) (James et al., 2020). CBT usually starts with a preparation phase of 6–8 sessions of anxiety management strategies (AMS; e.g., cognitive exercises to tackle anxious thoughts; relaxation exercises to tackle anxious bodily feelings), followed by 6–8 sessions of exposure (EXP) to tackle anxious actions like avoidance behavior by repeatedly exposing youth to fear provoking stimuli in the absence of repeated aversive outcomes (e.g., Coping Cat; Kendall, & Hedtke, 2006). Meta-analyses showed a moderate effect (Cohen's d = 0.39) of CBT for CADs when compared to active control, a large effect (Cohen's d = 0.77) when compared to passive control (Reynolds et al., 2012), and a large effect on secondary outcomes like comorbid anxiety and depression, and social self-efficacy (Kreuze et al., 2018). A full recovery of any anxiety diagnosis after CBT is reported in half to two-third of the cases (James et al., 2020). However, youth with a diagnosis of SoP have shown poorer outcomes after CBT than youth with other anxiety diagnoses (Hudson et al., 2015). This emphasises the need to optimize CBT for SoP in youth.

Given that available therapy time is typically limited in clinical practice (on average around eight sessions; Voort et al., 2010), one strategy that might help optimizing CBT for SoP is to restrict the interventions to the most critical treatment components. There seems general consensus about exposure being a necessary treatment component of CBT for CADs, supported by the findings that exposure sessions earlier in treatment (Gryczkowski et al., 2013), and more exposure sessions during treatment (Voort et al., 2010; Peris et al., 2017), are associated with better outcomes in youth. The evidence in support of AMS is less unequivocal.

The delivery of AMS before exposure is based on the assumptions that cognitive strategies are needed to change anxious cognitions (Kendall, 1985), that relaxation strategies are needed to change anxious bodily feelings (Öst et al., 1981), and that youth need AMS to tolerate exposure sessions (Manassis et al., 2010). Although no studies have directly examined whether AMS indeed contribute to the efficacy of exposure in treating CADs, indirect evidence suggests that AMS may not be necessary for the tackling of these thoughts and feelings or improvement of symptoms (Longmore & Worrell, 2007; Öst et al., 1993). For example, studies examining the effectiveness of AMS+EXP treatment protocols found symptom improvement only after the introduction of exposure. For instance, Kendall et al. (1997) reported on the preliminary examination of various CBT components in the Coping Cat protocol for youth, and suggested that the first protocol segment consisting of just AMS was not sufficient to produce meaningful change, while the second protocol segment consisting of just exposure was producing significant improvement of symptoms. More recently, a meta-analysis encompassing 35 RCTs concluded that delaying exposure until after AMS did not increase the efficacy of CBT for CADs, and that the use of relaxation was unrelated to treatment outcome (Ale et al., 2015). Moreover, a small RCT assessing 14 children with anxiety disorder(s) showed significantly greater improvement of anxiety symptoms for youth who followed just exposure sessions, compared to youth who followed just AMS sessions (Whiteside et al., 2015).

Devoting time to AMS before exposure has even been discouraged by some researchers (Craske et al., 2008). Craske et al. recommended eight strategies to enhance the effect of exposure, including increasing the expectancy of an aversive outcome during exposure, as the learning effect of exposure is thought to be optimal when there is a strong mismatch between the expectancy of an aversive outcome and the actual outcome during exposure (Rescorla & Wagner, 1972). Following these recommendations, they noted that AMS

(e.g., cognitive strategies that correct overestimation of an aversive outcome, relaxation strategies that could become a safety signal or safety behavior) could negatively impact this learning by reducing the expectancy of an aversive outcome. However, their recommendations are largely based on animal and adult research, in which the detrimental effect of AMS on exposure has not yet been directly tested.

Taken together, the available findings do not provide strong support for the view that AMS add to the effectiveness of exposure-based CBT. This raises the question whether AMS are needed for CBT to be effective, or whether the limited therapy time is better spent on exposure. On top of this, if AMS turn out to be unnecessary, devoting time to AMS at the cost of exposure may reduce the overall effectiveness of the intervention. After all, without lengthening the treatment, a preparation phase of AMS will leave the therapist with less time to spend on exposure. To optimize the effectiveness of a limited set of sessions, one might therefore prefer to omit the preparation phase and start with the exposure sessions right away. To assess if CBT for SoP might benefit from such a strategy, the current study tested whether exposure-only training is more effective in reducing SA in youth than a combined approach where the first half of the sessions is devoted to AMS like cognitive or relaxation strategies, and only the second half of the sessions to exposure.

The current study was designed as a single-blind, randomized controlled microtrial, and compared three parallel groups in a 6-week waitlist-intervention period design. Youths were randomized to a CBT training of five sessions consisting of either exposure-only training (EXP+EXP), cognitive strategies followed by exposure (COG +EXP), or relaxation strategies followed by exposure (REL+EXP). All types of training were rolled out in secondary schools and focused on adolescents (age 12–15) with SA. Considering the increased time spent on exposure, we expected the EXP+EXP training to be more effective in reducing speech anxiety than the COG+EXP training or the REL+EXP training. As a first step, we assessed whether the interventions were generally effective in reducing SA. Accordingly, we tested whether the decline in symptoms following the intervention period was larger than the decline following the waitlist period. Second, we tested if presenting two blocks of exposure (EXP+EXP) was more effective than one block of exposure preceded by either one block of cognitive strategies (COG+EXP) or one block of relaxation strategies (REL+EXP). Third, we explored whether the three types of interventions differentially affected the various dimensions of SA (thoughts vs. feelings vs. actions).

Methods

DESIGN

This study was a single-blind, randomized controlled microtrial comparing three parallel groups in a 6-week waitlist-intervention period design. Microtrials are aimed to gain insight into the efficacy of specific treatment components in specific disorders, by varying specific aspects of an intervention (Leijten et al., 2015). After registration for the study between 2017–2018 at their school, adolescents were screened for eligibility using the SPAI-C-PPF (screening). When eligible, the 6-week waitlist period followed, after which participants were assessed using a clinical interview, speech test, and self-report measures (pretest assessment). Within each school, participants were randomly assigned to one of three conditions; (1) exposure-only (EXP+EXP), (2) cognitive strategies followed by exposure (COG+EXP), or (3) relaxation strategies followed by exposure (REL +EXP). All three versions of the in-school group-based training consisted of weekly 1-hour sessions for 5 weeks and started with a psychoeducation session (PE), followed by either four exposure sessions (EXP+EXP); two cognitive restructuring and two exposure sessions (COG+EXP) or two relaxation and two exposure sessions (REL+EXP). Participants returned for posttest assessment 1 week after completion of the training and for follow-up assessment 6 weeks after completion of the training. The study was approved by the Medical Ethical Committee of the University Medical Centre in Groningen, the Netherlands (#METc2016/696). The current trial was registered at the US National Institutes of Health (ClinicalTrials.gov: #NCT03711513). Current report of the trial follows the CONSORT guidelines (Moher et al., 2010). A CONSORT-PSI checklist can be found in Appendix A.

PARTICIPANTS

Participants who scored at least one standard deviation above the reported American normal control group mean (i.e., 3.72 + 2.63 = 6.35; Beidel et al., 1995) on the Public Performance Factor (PPF) of the SPAI-C were included in the study (N = 65; age 12–15; 42 girls, 93.8% meeting criteria for SA at pretest). Table 1 provides an overview of baseline participant characteristics for each condition. We lost six participants from pretest to posttest, and two more participants from posttest to

Table 1
Summary Measures of Baseline Participant Characteristics by Condition

	EXP+EXP ($n = 21$)	COG+EXP ($n = 22$)	REL+EXP ($n = 22$)
Gender (n (%) girls)	15 (71.4%)	13 (59.1%)	14 (63.6%)
Age in years (M (SD))[1]	13.00 (.95)	13.23 (.81)	13.05 (.09)
Speech anxiety (M (SD))[2]	9.65 (1.66)	10.08 (1.63)	9.17 (1.95)

[1] Dutch adolescents aged 12–15 year are in the 1st, 2nd or 3rd year of secondary school.
[2] As measured by SPAI-C-PPF. EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions.

follow-up. The percentage of dropout did not differ across conditions: 9.5% versus 13.6% versus 9.1%; χ^2 (2) = 1.07, p = .590.

PROCEDURE

Secondary schools in the northern Netherlands were approached by the research coordinator, who provided them with information about the current study, and who obtained the schools' free and voluntary consent. The mental health coordinators of all participating schools provided all 12 to 15-year-old students and their parent(s) with information about the study, who were then given 2 weeks to provide their written informed consent for participation in the study to the research coordinator. Participants from whom we received the required parent and child informed consent forms (N = 91) were screened using the SPAI-C-PPF; see Figure 1 for a flow diagram. Exclusion criteria were as follows: no informed consent from both adolescent and parent(s), currently in treatment for anxiety problems or received treatment for anxiety problems in the past year, current diagnosis of autism spectrum disorder (ASD) or attention-deficit (hyperactivity) disorder (AD(H)D), and/or (risk of) suicidality or treatment warranted for other mental health issues. In the latter case, adolescents were referred to local mental health centers to receive regular care.

INTERVENTIONS

The present CBT training was created based on current gold-standard treatment protocols for anxiety disorders in youth (e.g., Coping Cat: Kendall & Hedtke, 2006; Cool Kids: Lyneham et al., 2003) and in close consultation with certified CBT psychologists. In addition to the to-be-studied CBT components, psychoeducation (PE) on SA based on the model by Clark and Wells (1995) and Rapee and Heimberg (1997) was added to tailor the training to SA specifically (in line with Sportel et al., 2013). All three versions of the training started with this PE session, in which participants learned about speech anxiety and the rationale behind exposure, created a fear hierarchy of 10 steps, and set an idiosyncratic goal behavior (step 10) they wanted to achieve during treatment. Next, participants formulated their belief about the expected feared outcome when performing their goal. In the COG sessions, participants identified dysfunctional cognitions, evaluated the accuracy and helpfulness of those cognitions, and modified them into less dysfunctional cognitions. In the REL sessions, participants learned to tighten and relax major muscles one at a time, as well as how to regulate their breathing. In the EXP sessions, participants gradually practiced different public speaking/performance tasks based on their fear hierarchy. All participants received homework assignments to practice in between Sessions 2 and 5 (e.g., in school or at home). Although the three conditions did not differ in the way exposure was provided, the amount of exposure was different for the three conditions: the EXP+EXP condition received 4×45 minutes in-session + homework of 4×45 minutes between-session exposure, i.e., a total of 180 minutes (360 minutes if all homework exercises were carried out). The COG+EXP and the REL+EXP condition received: 2×45 minutes in-session + homework 2×45 minutes between-session, i.e., a total of 90 minutes (180 minutes if all homework exercises were carried out).

THERAPISTS AND SETTING

All three versions of the training consisted of five weekly 1-hour sessions. These sessions took place at school, in small groups of minimum four and maximum six participants. In-school CBT has already proven to be effective in reducing anxiety symptoms (Sportel et al., 2013) and preventing the onset of anxiety disorders (Masia-Warner et al., 2005), with small to moderate effect sizes. All sessions were provided by psychologists who were familiar with CBT and experienced in working with anxious youth, assisted by a master student in clinical psychology. These psychologists received a 3-hour training in the treatment protocol and thereafter weekly supervision by an experienced and certified CBT therapist. To rule out

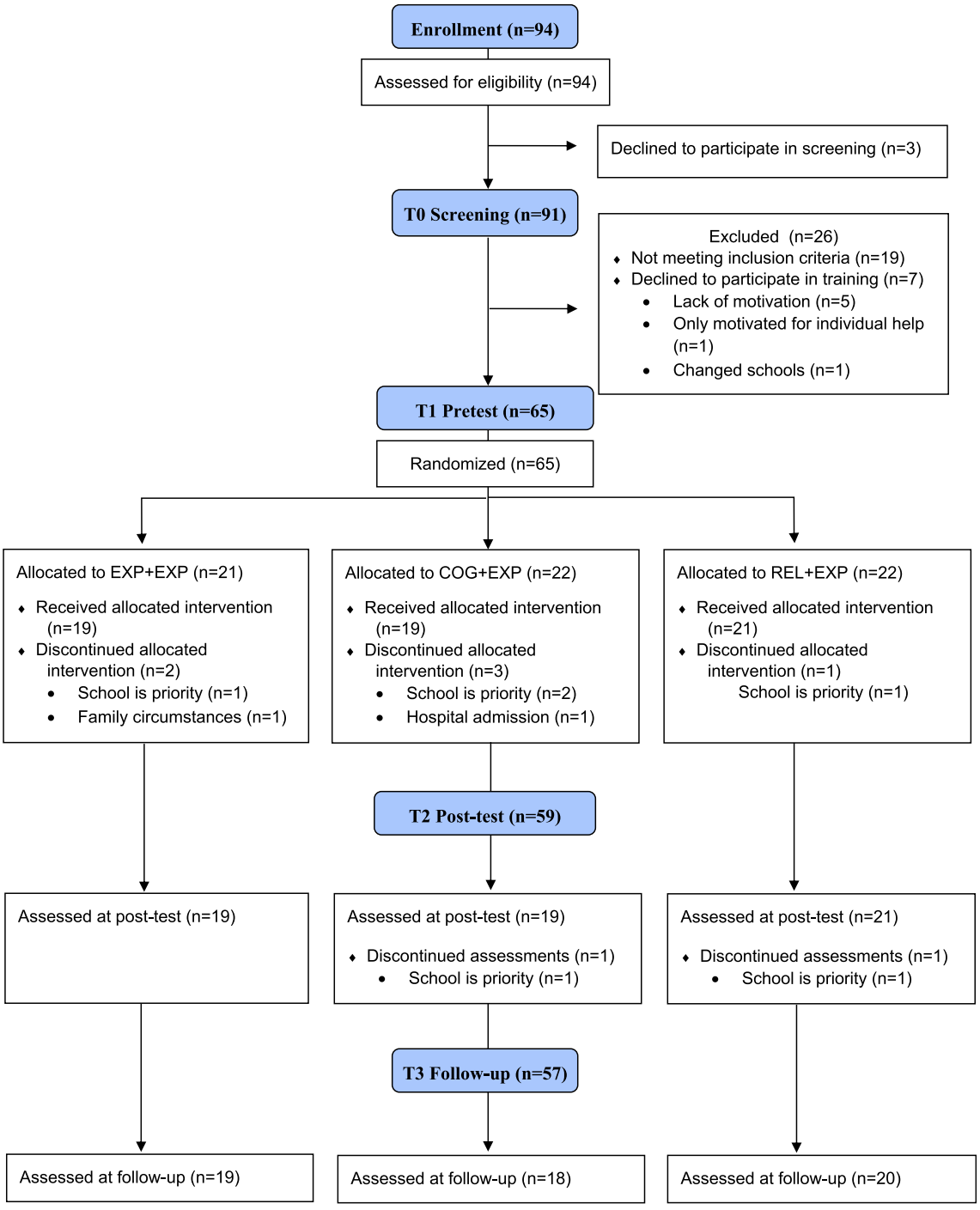

FIGURE 1 CONSORT Participant flow diagram.

therapist effects, all psychologists provided all versions of the training.

RANDOMIZATION

The research coordinator randomly assigned adolescents after pretest by balanced randomization (1:1:1) using a randomization program based on the Sealed Envelope program. This program was accessed via the internet by the research coordinator only. Randomization was conducted within each school, with three conditions per school to ensure adequate group sizes with equal ratios within schools. Randomization took place with stratification on gender, age and severity of the

speech anxiety symptoms. Research assistants, who conducted the assessments pretest, posttest, and at 6-week follow-up, were blinded to treatment allocation. The research coordinator, psychologists, treatment assistants, supervisor, and participants were not blinded to treatment allocation.

OUTCOMES

Treatment Measures

Treatment satisfaction. Treatment satisfaction was measured posttest with the Service Satisfaction Scale for Children (SSS-C: Athay & Bickman, 2012). The original SSS-C contains four items rated on a 4-point scale (1 = *No, definitely not*; 4 = *Yes, definitely*). Because the current treatment was provided as a one-time research project, we removed item (3), "If you were to seek help again, would you seek it from us?" The responses to the other three items were averaged to create a total score. Cronbach's alpha indicated good internal consistency for the SSS ($\alpha = 0.83$).

Treatment adherence. Treatment adherence was assessed using a weekly checklist consisting of all the aspects that needed to be administered in the session. During each session, a master student observed the psychologist who provided the session, and ticked the boxes of all items that the psychologist administered in the session, plus rated the duration of the session. At the end of the session the checklist was double-checked by the psychologist together with the master student.

Homework compliance. Homework compliance was assessed using a weekly checklist in which the adolescents stated how much time they spent on homework assignments.

Understanding of rationale. To check whether the participants understood the rationale of exposure, the psychologist asked the adolescents to repeat this at the end of the PE session. Their individual answers were then rated by the psychologist on a VAS ratio scale ranging from "I do not believe the participant understands exposure at all" (0) – "I completely believe the participants understands exposure" (100).

Note that the preregistration of this study also contained the Credibility and Expectancy Scale for Children (CEQ; Borkovec & Nau, 1972). Accidentally, this measure was only assessed at posttest. Since post-hoc expectancies are too much influenced by treatment gains, we decided not to report on this measure.

PRIMARY OUTCOME

Speech Anxiety Symptoms

Subjective SA symptoms were measured with the Public Performance Factor (PPF) subscale of the Social Phobia and Anxiety Inventory for Children (SPAI-C-PPF; Beidel et al., 1995, Dutch version by Utens et al., 2000) at screening, pretest, posttest, and follow-up. This subscale contains seven items like "speaking in front of the class." Participants were asked to rate how often they feel nervous or scared in these situations, using a three-point Likert scale ranging from never (0) to most of the time or always (2). Internal consistency of the SPAI-C-PPF was acceptable to good indicated by $\alpha = .65$ at screening, and by $\alpha = .82$ at pretest.

SECONDARY OUTCOMES

Social Phobia

The presence and severity of social phobia was based on the SoP section of the child version of the semistructured diagnostic interview the Anxiety Disorder Interview Schedule for Children (ADIS-C; Silverman, & Albano, 1996; Dutch version by Siebelink & Treffers, 2001) at pretest, posttest, and follow-up. After the interview, and in line with recent recommendations for reporting on treatment trials (Creswell et al., 2021), a consensus based clinician severity rating (CSR) was assigned by an assessor, who was trained in the ADIS and supervised by the research coordinator together with a certified CBT therapist. A CSR of 0, 1, 2, or 3 indicates there is no clinical SoP, a CSR of 4 and higher indicates that the participants met the criteria for SoP. We assessed all items of the SoP section of the ADIS, also when only mild symptoms were reported, so that CSR scores below 4 could also be assigned.

Speech Behavior

Speech behavior was assessed using an adapted version of the Trier Social Stress Test for Children (TSST-C; Buske-Kirschbaum et al., 1997) at pretest, posttest, and follow-up. In this test, participants receive the beginning of a story. Participants were told that after a preparation period of 5 minutes, they should finish the story, making the story sound as exciting as possible in front of a camera. Participants were told that the camera was recording and that their performance would be rated by their teacher(s) and the research team. Whenever participants finished telling the story in less than 5 minutes, they were asked to continue in a friendly, supportive matter. Other than that, the research assistant present during the performance did not provide the participants with any looks or any feedback but pretended to take notes

instead. When participants finished telling the story, or when the 5 minutes were over, the camera was switched off. In fact, the camera was never recording and the participants were debriefed about this at the end of the follow-up assessment. Right after performing, the participants were asked to rate their peak anxiety on a "subjective level of disturbance scale" from 0–100 (SUDs; Wolpe & Lazarus, 1966). In addition, speech duration was measured in seconds, with a minimum of 0 and a maximum of 300 seconds. If a participant needed support to continue until the 5 minutes were over, but decided to stop, the time they stopped was used.

Comorbid Anxiety and Depression

At pretest, posttest, and follow-up, comorbid anxiety and depression was assessed with the Revised Child Anxiety and Depression Scale for Children (RCADS-C; Chorpita et al., 2005, Dutch version by Oldehinkel, 2000) consisting of 47 items. All items were rated on a 4-point interval scale from *never* (0) to *always* (3). Total scores above 50 are considered to be falling in the clinical range. High Cronbach's alpha at pretest ($\alpha = 0.95$), posttest ($\alpha = 0.95$), and follow-up ($\alpha = 0.95$) indicated excellent internal consistency.

Social Self-Efficacy

Social self-efficacy was measured by the Self Efficacy Questionnaire for Children (SEQ-C; Muris, 2001) at pretest, posttest, and follow-up. This questionnaire contains 24 questions regarding academic, social, and emotional self-efficacy. Only the eight items regarding social self-efficacy (SEQ-C-S) were rated on a 5-point interval scale from *not at all* (1) to *very well* (5). Cronbach's alpha was high at pretest ($\alpha = 0.73$), posttest ($\alpha = 0.69$), at follow-up ($\alpha = 0.86$), indicating good to excellent internal consistency.

TERTIARY OUTCOME

Idiosyncratic Goal

In the first session, all participants set their idiosyncratic goal behavior for the training. This goal always pertained being able to speak publicly (e.g., "Giving a ten-minute speech in front of 30 peers"). Next, participants formulated their belief about the expected feared outcome when performing their goal (e.g., "When I give a ten-minute speech in front of 30 peers, I will forget what to say and everyone will laugh at me"). Using VAS ranging from 0–100, six questions regarding their goal and their belief were asked. The first four questions started with the following:

"Imagine you have to perform "your goal" *right now*. . .":

1. How anxious would you feel? *not anxious* (0) – *extremely anxious* (100)
2. How often would you avoid this situation? *never* (0) – *always* (100)
3. How well can you cope with this situation? *not at all* (0) – *extremely well* (100)
4. How tense would your body feel? *not tense* (0) – *extremely tense* (100)

The final two questions regarding the belief were as follows:

5. How much do you believe this could actually happen? *not at all* (0) – *very strongly* (100)
6. How much would you mind if this actually happened? *not at all* (0) – *a lot* (100)

These VAS scores were analyzed separately as indices of anxiety, avoidance, coping, bodily tension, the credibility and evaluation of the belief. After the PE session (i.e., Session 1) and before the start of the first module (i.e., Session 2 and 3, either AMS or EXP), VAS ratings were completed as pretest assessment. After the first module but before the start of the second module (i.e., Session 4 and 5, only EXP) VAS ratings were completed as mid-test assessment. In addition, participants completed VAS ratings during posttest and at six-week follow-up.

Sample Size

A priori power analyses using G*Power 3.1 (Faul et al., 2007) suggested that for a repeated measures MANOVA with three groups (EXP+EXP vs. COG +EXP vs. REL+EXP), four time points (screening, pretest, posttest, follow-up), alpha = .05 and power = .80, a total sample of 12 was required to be able to (1) detect a large within-subject time effect of 0.77 (passive control: Reynolds et al., 2012). For detection of (2) a medium time by condition interaction effect of 0.39 (active control: Reynolds et al., 2012) a total sample of 49 was required. However, both dropout and loss of power due to clustering of data had to be taken into account, considering the intervention was given in groups with a mean of 5 adolescents per group. Therefore, intraclass correlation (estimated at 0.05) was incorporated into the sample size calculation (Moerbeek et al., 2003). To account for this correlation and dropout, we increased the sample size by 33%, resulting in 49 + 16 = 65 participants (21–22 in each condition, with a mean of 5.3 children per condition per school). Bonferroni-Holm correction was used to correct for multiple

comparisons, so the original alpha of 0.05 was set to 0.004 (0.05/12 as we did 4 (time points) × 3 (conditions) tests).

Statistics

Multilevel analysis, using MLwiN Version 2.36 (Rasbash et al., 2015), was used to test (1) whether the intervention (posttest, follow-up) was more effective in reducing speech anxiety than no intervention during a baseline period (screening, pretest), and (2) whether exposure-only training was more effective in reducing speech anxiety than a combination of exposure with cognitive or relaxation strategies. In addition, we explored (3) which dimensions of anxiety (thoughts vs. feelings vs. actions) were affected most by which specific component (COG vs. REL vs. EXP). The data had a three-level structure, with the time points nested in participants, who were nested in training groups. Multilevel modeling takes into account this hierarchical structure and uses all available data at all the time points without the need for imputation of missing values (Snijders & Bosker, 1999). An empty three-level model of the primary outcome of speech anxiety (SPAI-C-PPF) showed no significant effect of training group, χ^2 (1) = 3.75, p = .053, and therefore we used two-level models. Separate two-level models (level 1: time point; level 2: participant) were estimated for the primary outcome (SPAI), for the secondary (ADIS, TSST, RCADS, SEQ) and tertiary outcomes (VAS).

The analysis strategy for the primary outcome measure was as follows. First a random intercept model was built with the following predictors as fixed effects: (a) dummy variables representing time (screening, posttest, follow-up); and (b) the interactions posttest*condition and follow-up*condition. This random intercept model was built using three dummy variables for time with pretest as reference category, and two dummy variables for condition with EXP+EXP as reference category. If, as expected, the effect of screening was not significant, we proceeded with a model dropping the dummy for screening, yielding the intercept "baseline" pertaining to screening and pretest. Then the model was used to test the main effect of time (i.e., whether the intervention was more effective in reducing speech anxiety than no intervention during a baseline period), and the differences in time effect across conditions (i.e., whether exposure-only training was more effective in reducing speech anxiety than a combination of exposure with cognitive or relaxation strategies). No main effect of condition was included, because the randomization design ensured no expected differences between conditions at baseline.

For the secondary outcomes, we followed a similar procedure, yet entering only the dummy variables for posttest and follow-up, as we did not assess these outcomes at screening. In addition to multilevel analysis, chi-squared tests were used to assess changes in presence of SoP over time. For the tertiary outcomes, we used the VAS ratings concerning the idiosyncratic goals that were assessed at the end of session 1 (pretest) and at the start of Session 4 (mid-test). Hence, we built the random intercept model including a dummy variable for session (pretest and mid-test), followed by the dummy variables for time (posttest and follow-up), to explore which dimensions of anxiety (thoughts vs. feelings vs. actions) were affected by which specific component (COG vs. REL vs. EXP).

The statistical significance of fixed effects was tested using the approximate t-test and of random effects using the deviance test (e.g., Snijders & Bosker, 1999). Both tests were conducted one-tailed with the significance level set at $\alpha = .05$ (.004 after Bonferroni-Holm correction for 4 [time] × 3 [conditions]). The reported effect sizes (Cohen's d) for significant effects over time were derived from the differences in sample means between time points for all participants together, divided by the estimated standard deviation at pretest. Reported effect sizes for significant group differences at posttest or follow-up were derived from the differences in sample means between groups divided by the estimated pooled standard deviation (e.g., the weighted average of standard deviations for the different groups). All analyses were conducted following the intent-to-treat principle, including all 65 participants.

Results

PRELIMINARY ANALYSIS

Missing Data

A detailed overview of the participant flow is provided in Figure 1. Dropout rates were low and did not differ across conditions. There was no indication of selective attrition, given that at pretest, there were no significant differences between participants who completed all assessments and those who only completed the pretest assessment (SPAI-C-PPF: t[63] = 1.11, p = .27).

Treatment Measures

To check the feasibility of the different versions of the training, results on treatment satisfaction, understanding of exposure and homework compliance are reported (see Table 2). After treatment, none of these aspects of the training differed significantly between the conditions. Sessions lasted a

Table 2
Summary Measures of Treatment Characteristics by Condition

	EXP+EXP (*M (SD)*)	COG+EXP (*M (SD)*)	REL+EXP (*M (SD)*)
Treatment satisfaction (SSS)	3.6 (0.1)	3.4 (0.2)	3.3 (0.7)
Understanding exposure (VAS)	78.1 (11.5)	74.8 (9.4)	77.9 (11.0)
Time spent on homework (minutes)	54 (52)	51 (54)	59 (54)

Note. SSS = Service Satisfaction Scale (range 0–4), VAS = Visual Analogue Scale (range 0–100). EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions.

little over the planned 60 minutes ($M = 64$, $SD = 8.5$), usually due to waiting for participants who showed up too late or due to wrapping up exposure exercises that sometimes took place outside the training room. In 9 of the 12 training groups there was not enough time to finish setting up the fear hierarchy in the first session, so the hierarchies were finished at the start of the second session. In the EXP+EXP training, all participants reached step 9 or 10 of their fear hierarchy. In the COG+EXP and REL+EXP training, all participants reached step 4 or 5 of their fear hierarchy. Participants reported to have spent on average 20 ($SD = 18$) minutes on homework after each session. During the follow-up period of six weeks, participants reported to have spent on average 32 ($SD = 25$) minutes on public speaking/performing tasks.

MAIN ANALYSIS

Descriptive Statistics Per Time Point and Statistical Testing of Time Effects

The observed sample means and SD per time point for six outcome measures (SPAI to SEQ) are provided in Table 3; Table 4 provides the estimates of the multilevel modeling of these outcome measures, which are used for the statistical testing. Similarly, Table 5 provides the sample statistics per time point for the six VAS ratings, and Table 6 the accompanying multilevel model estimates. Thus, Tables 3 and 5 offer direct insight into the observed statistics, while Tables 4 and 6 provide information on the statistical significance of the effects.

INTERVENTION PERIOD VERSUS WAITLIST PERIOD

Primary Outcome

First, we found no significant difference in SA symptoms (SPAI-C-PPF) between screening and pretest, χ^2 (1) = 0.27, $p = .60$, so screening was dropped from the random intercept model of SA symptoms (see Table 4). The intercept therefore pertained to screening and pretest, further referred to as baseline. SA symptoms reduced significantly from baseline to posttest (ES: Cohen's $d = 1.10$), and from baseline to follow-up (ES: Cohen's $d = 1.40$). So, the intervention period resulted in a decline of speech anxiety whereas waitlist period did not. At posttest, 40.4% of the participants scored below the reported American normal control group mean of 6.35 on the SPAI-C-PPF, at follow-up this was 49.1% (Beidel, et al., 1995).

Secondary Outcomes

Chi-squared tests showed that less participants met the criteria for SoP at posttest than at pretest, χ^2 (1) = 4.76, $p = .03$, and at follow-up than at pretest, χ^2 (1) = 5.79, $p = .02$; however, these effects were not significant after Bonferroni correction. See Appendix B (Table 7) for the number of participants who met criteria for SoP at the different time points. SoP reduced significantly from pretest to posttest (ES: Cohen's $d = 0.76$), and from pretest to follow-up (ES: Cohen's $d = 1.37$). During the TSST, self-reported peak anxiety ratings reduced significantly from pretest to posttest (ES: Cohen's $d = 0.83$), and from pretest to follow-up (ES: Cohen's $d = 1.27$). In addition, speech duration increased significantly from pretest to posttest (ES: Cohen's $d = 0.35$), but did not increase significantly from pretest to follow-up. Moreover, comorbidity decreased significantly from pretest to posttest (ES: Cohen's $d = 0.51$) and from pretest to follow-up (ES: Cohen's $d = 0.70$). Finally, self-efficacy increased from pretest to posttest and from pretest to follow-up; however, these effects were not significant after Bonferroni correction. See Table 4 for random intercept models.

DIFFERENCES BETWEEN CONDITIONS

Approximate t-tests showed that after Bonferroni correction, differences in speech anxiety symptoms, social phobia severity, peak anxiety and speech duration during the Trier social stress test, comorbid anxiety and depression, and self-efficacy between the EXP+EXP group and COG+EXP or REL+EXP groups were nonsignificant after treatment (interactions of time effects and condition); see Table 5.

Table 3
Means (M) and Standard Deviations (SD) Per Time Point

	EXP+EXP		COG+EXP		REL+EXP	
Variables	***M***	***SD***	***M***	***SD***	***M***	***SD***
SA symptoms (SPAI)						
Screening	9.65	1.66	10.08	1.63	9.17	1.95
Pretest	9.37	2.69	9.83	2.31	9.14	2.78
Posttest	5.98	3.05	6.76	3.16	6.57	2.46
Follow-up	5.42	3.33	5.35	3.95	5.15	2.80
SoP severity (ADIS)						
Pretest	5.29	1.19	5.32	0.78	4.95	1.13
Posttest	4.06	1.43	4.44	1.34	4.35	1.14
Follow-up	3.47	1.38	3.36	1.61	3.72	1.09
Peak anxiety (TSST)						
Pretest	75.50	23.45	75.23	18.30	75.39	16.73
Posttest	48.29	29.00	60.00	27.33	59.95	22.32
Follow-up	36.59	24.81	44.89	28.23	54.45	26.53
Speech duration (TSST)						
Pretest	205.05	93.07	198.36	105.70	189.13	91.89
Posttest	252.29	75.62	216.94	98.18	221.62	90.19
Follow-up	221.53	95.85	227.67	80.39	227.67	83.90
Comorbidity (RCADS)						
Pretest	38.95	21.77	44.67	21.78	38.25	18.29
Posttest	29.11	22.34	31.33	19.63	30.85	17.81
Follow-up	27.68	21.25	27.00	19.31	25.32	18.45
Social self-efficacy (SEQ)						
Pretest	27.21	3.49	24.81	4.64	24.65	4.31
Posttest	28.50	3.81	27.78	4.31	27.10	4.05
Follow-up	28.47	4.05	28.5	7.29	27.37	4.57

Note. SPAI = SPAI-C-PPF (range 0–14), ADIS = ADIS-SP-C-CSR (range 0–8, clinical range 4–8), TSST = Trier Social Stress Test (range peak anxiety 0–100, range speech duration 0–300), RCADS = Revised Children Anxiety & Depression Scale (range 0–141), SEQ = Self-Efficacy Questionnaire (range 8–40). EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL +EXP = relaxation and exposure sessions.

DIMENSIONS OF ANXIETY AFFECTED BY THE DIFFERENT COMPONENTS

Tertiary Outcome

Overall, all dimensions of anxiety changed significantly from pretest to mid-test, from pretest to posttest, and from pretest to follow-up. The pattern for EXP+EXP was similar to the patterns for COG+EXP and REL+EXP at mid-test and follow-up. At posttest, evaluation of belief decreased significantly more in the EXP+EXP group compared to the REL+EXP group (posttest*condition effect controlled for multiple comparisons), while the pattern was similar across conditions for the other dimensions, see Table 6.

Discussion

The current study tested whether exposure only (EXP+EXP) is more effective in reducing speech anxiety in youth than a combination of exposure preceded by AMS like cognitive (COG+EXP) or relaxation strategies (REL+EXP). The major results of this study can be summarized as follows: Independent of condition, (i) the intervention period resulted in a stronger decline of speech anxiety than waitlist period; (ii) there was a large sized reduction (ES ranging from 0.35 to 1.40) of speech anxiety that was maintained at 6-week follow-up. (iii) At follow-up, half of the participants scored below the inclusion criterion on the speech anxiety inventory, indicating the training resulted in a clinically relevant reduction of symptoms; (iv) there was no meaningful difference in the efficacy of EXP+EXP versus COG+EXP or REL+EXP; (v) all dimensions of anxiety generally decreased at mid-test, posttest, and follow-up, and the pattern of decrease did not differ between EXP+EXP versus COG+EXP and REL+EXP, except for the

Table 4
Estimated Fixed and Random Effects of the Multilevel Models of the Primary and Secondary Outcomes

Parameter	SA symptoms (SPAI) *β (SE)*	SoP severity (ADIS) *β (SE)*	Peak anxiety (TSST) *β (SE)*	Speech duration (TSST) *β (SE)*	Comorbidity (RCADS) *β (SE)*	Self-efficacy (SEQ) *β (SE)*
Fixed effects						
Time						
Intercept	9.53 (0.28)	5.19 (0.15)	75.37 (2.89)	197.15 (11.07)	40.54 (2.46)	25.62 (0.59)
Post-time effect	−3.51 (0.54)*	−1.15 (0.26)*	−26.30 (5.38)*	51.03 (15.90)*	−9.99 (3.16)*	2.23 (1.05)˜
Follow-up time effect	−4.07 (0.54)*	−1.73 (0.26)*	−38.00 (5.38)*	20.26 (15.90)	−11.32 (3.09)*	2.23 (1.02)˜˜
Post * COG+EXP	0.41 (0.76)	0.31 (0.35)	9.28 (7.12)	−37.74 (21.62)˜	−3.67 (4.36)	0.65 (1.39)
Follow-up * COG+EXP	−0.35 (0.76)	−0.15 (0.35)	6.49 (7.12)	4.00 (21.62)	−5.03 (4.32)	1.02 (1.37)
Post * REL+EXP	0.62 (0.74)	0.33 (0.34)	10.75 (6.88)	−13.62 (20.90)	0.96 (4.29)	−0.25 (1.36)
Follow-up * REL+EXP	−0.24 (0.74)	0.29 (0.34)	16.72 (6.95)˜˜	23.19 (20.90)	−3.52 (4.28)	0.07 (1.36)
Random effects						
Variances of						
Level 2 – Intercept	2.89 (0.71)	0.73 (0.18)	229.948 (63.08)	5545.64 (1149.05)	281.91 (56.86)	8.53 (2.42)
Level 1 – Residual	4.08 (0.43)	0.74 (0.10)	312.261 (41.79)	2418.60 (322.78)	96.76 (13.17)	12.29 (1.67)

Note. * = significant at $p < .004$, one-tailed, ˜˜ = trend significant at $p < .01$, one-tailed, ˜ = trend significant at $p < .05$, one-tailed. Note that alpha was set at $p < .004$ with a Bonferroni correction. EXP+EXP is reference category. EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions

Table 5
Means (M) and Standard Deviations (SD) of the VAS Ratings at Different Time Points

	EXP+EXP M (SD)				COG+EXP M (SD)				REL+EXP M (SD)			
Variables	Pretest	Mid-test	Posttest	Follow-up	Pretest	Mid-test	Posttest	Follow-up	Pretest	Mid-test	Posttest	Follow-up
Idiosyncratic goal												
Anxiety	82.1	60.9	43.6	43.6	77.6	66.7	52.2	40.9	81.9	67.4	51.3	53.6
	(12.0)	(16.4)	(23.4)	(27.5)	(20.1)	(21.5)	(23.8)	(24.5)	(10,9)	(12.2)	(18.3)	(20.4)
Avoidance	67.4	46.8	33.1	28.2	67.3	55.6	39.7	28.3	59.7	49.6	37.3	35.4
	(28.2)	(26.4)	(25.7)	(27.9)	(27.7)	(27.0)	(29.3)	(27.0)	(33.3)	(27.9)	(25.3)	(27.5)
Coping	54.9	64.5	70.2	72.5	52.7	61.7	69.5	71.9	53.8	56.6	68.2	66.6
	(24.0)	(18.0)	(16.7)	(18.5)	(22.8)	(15.5)	(19.5)	(21.4)	(18.5)	(17.7)	(14.9)	(15.4)
Bodily tension	81.9	64.3	50.5	46.5	71.8	71.7	53.1	45.8	83.3	69.7	55.4	53.4
	(16.2)	(19.0)	(25.2)	(25.1)	(23.6)	(20.1)	(22.6)	(24.1)	(11.6)	(15.0)	(17.2)	(22.2)
Credibility of belief	65.1	52.9	32.6	36.2	62.1	55.3	40.6	29.4	67.0	56.6	43.3	41.8
	(22.9)	(22.0)	(22.6)	(24.3)	(18.0)	(22.3)	(26.7)	(16.8)	(15.0)	(19.1)	(15.8)	(23.6)
Evaluation of belief	75.6	57.9	42.9	45.3	77.6	71.9	60.0	50.9	83.0	70.6	65.0	63.9
	(18.4)	(20.9)	(24.3)	(22.3)	(22.1)	(21.1)	(29.5)	(30.7)	(16.5)	(17.0)	(20.4)	(23.3)

Note. EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions.

evaluation of the threat belief, which was affected more effectively by EXP+EXP than by REL+EXP.

EXPOSURE ONLY VERSUS EXPOSURE COMBINED WITH ANXIETY MANAGEMENT STRATEGIES

Based on the major results of this study we can conclude that a short group-based CBT training consisting of only five sessions was an effective and efficient way to treat speech anxiety in youth. Following all three versions of the training we found a large-sized reduction of symptoms comparable to numbers found in previous studies on the effect of CBT for CADs (James et al., 2020; Reynolds et al., 2012). When zooming in on the combinations of CBT components that were included in the design, we found that almost all dimensions of anxiety were affected by all combinations of CBT components, even if a dimension was not the explicit focus of a component. These findings are in line with previous research showing that cognitive strategies to directly tackle thoughts and relaxation strategies to directly tackle feelings are not necessary in addition to exposure in which these thoughts and feelings are indirectly tackled (Longmore & Worrell, 2007; Öst et al., 1993).

With regard to the main results of the current study, we can also conclude that devoting all sessions to exposure is not more effective than combining exposure with AMS. This finding is in line with a meta-analysis of 108 CBT trials on the treatment of adult anxiety disorders that found exposure-only treatments to be as effective as a combination of exposure with AMS (Norton & Price, 2007). This suggests that for both adults and youth, devoting the scarce therapy time solely to exposure is as beneficial as the common practice of devoting half of the therapy time to AMS and half of it to exposure. So, contrary to what is generally assumed, AMS appear neither necessary for CBT to be effective nor for youth to tolerate the exposure sessions, as drop-out and satisfaction ratings of all versions of the training were comparable in the current study. This indicates that the rationale behind the AMS-before-exposure approach might be outdated, but despite this the approach itself is as effective as the exposure-only approach.

METHODOLOGICAL CONSIDERATIONS

Considering the comparable results of the different combination of CBT components, it seems that four exposure sessions are not more effective in reducing speech anxiety than two AMS sessions followed by two exposure sessions. One explanation for the failure to find the predicted superior effectiveness of the EXP+EXP combination could be that two exposure sessions were already sufficient to reach the overall treatment effects. Because all conditions involved two exposure sessions, this would then explain the similarity in overall effectiveness between EXP+EXP and AMS+EXP. However, if two exposure sessions are indeed sufficient for treatment to be effective, one would already expect saturation of treatment effect after the first block of exposure and no additional value of the second block of exposure in the EXP+EXP treatment. Nevertheless, mid-test assessment of the different dimensions of anxiety showed that the anxious thoughts, feelings, and actions decreased further following the second block of exposure. This seems to suggest that two exposure sessions are not sufficient to reach overall treatment effects, and therefore possibly not the sole component responsible for effective treatment. However, it cannot be ruled out that part of this further decline in symptoms is in fact due to a delayed effect of the first block of exposure. An alternative explanation of the absence of a superior effect of EXP+EXP on participants' speech anxiety could be that AMS had similar added value as a second block of two exposure sessions. Mid-test assessment of the different dimensions of anxiety showed that there was a continuous decrease of anxious thoughts, feelings, and actions that was comparable for EXP+EXP as for AMS+EXP. Although this seems to suggest that two extra sessions of AMS may indeed have a similar added value as two extra exposure sessions, there are a few remarks to be made. First, in all three conditions adolescents received introduction to and planning for exposure prior to mid-test assessment, which could have contributed to mid-treatment improvement. Second, the VAS used for mid-test assessment is an unvalidated measure and therefore not sufficient to support strong conclusions. The findings with regard to the effect of two sessions of AMS (or EXP) remain therefore inconclusive.

LIMITATIONS AND STRENGTHS

Following from these methodological considerations, the first limitation of the current study is the omission of a mid-test assessment of speech anxiety symptoms. Second, our design lacked a long-term follow-up assessment—for example, after 6 months instead of after 6 weeks, to assess further improvement or relapse of symptoms. Third, previous research suggests that variables like age, gender, and comorbid anxiety and depression can act as potential predictors and/or moderators of change in anxiety symptoms in youth

Table 6
Estimated Fixed and Random Effects of the Multilevel Models of the VAS Ratings

Parameter	Anxiety β (*SE*)	Avoidance β (*SE*)	Coping β (*SE*)	Bodily tension β (*SE*)	Credibility β (*SE*)	Evaluation β (*SE*)
Fixed effects						
Time						
Intercept	80.42 (2.43)	64.86 (3.44)	53.76 (2.33)	78.74 (2.56)	64.66 (2.60)	79.18 (2.80)
Mid-test effect	−20.25 (4.19)*	−18.54 (4.96)*	10.45 (4.29)~~	−16.53 (4.05)*	−11.07 (4.27)~~	−20.55 (4.06)*
Post-time effect	−37.36 (4.28)*	−31.52 (5.06)*	15.89 (4.39)*	−29.84 (4.14)*	−31.19 (4.37)*	−35.57 (4.14)*
Follow-up time effect	−37.30 (4.28)*	−36.35 (5.06)*	18.22 (4.39)*	−33.84 (4.14)*	−27.64 (4.37)*	−33.18 (4.14)*
Mid-test * COG+EXP	7.79 (5.66)	8.28 (6.86)	−1.10 (5.72)	14.16 (5.55)~~	2.70 (5.82)	13.53 (5.63)~~
Post * COG+EXP	10.46 (5.73)~	5.43 (6.94)	−.30 (5.79)	8.86 (5.62)	8.10 (5.89)	16.61 (5.70)~~
Follow-up * COG+EXP	−0.73 (5.73)	−0.47 (6.93)	0.77 (5.78)	5.71 (5.61)	−4.12 (5.96)	6.41 (5.76)
Mid-test * REL+EXP	6.67 (5.58)	7.25 (6.76)	−7.22 (5.64)	5.21 (5.47)	2.19 (5.74)	9.57 (5.53)~
Post * REL+EXP	7.57 (5.59)	7.22 (6.78)	−1.46 (5.65)	4.00 (5.48)	8.66 (5.75)	18.99 (5.54)*
Follow-up * REL+EXP	9.86 (5.59)~	10.20 (6.78)	−5.45 (5.65)	6.05 (5.48)	3.56 (5.75)	15.51 (5.54)~~
Random effects						
Variances of						
Level 2 – Intercept	159.56 (39.49)	464.97 (97.79)	229.948 (63.08)	219.63 (49.31)	208.41 (48.43)	301.77 (63.88)
Level 1 – Residual	207.10 (22.57)	267.15 (29.13)	312.261 (41.79)	185.21 (20.18)	209.86 (23.06)	179.35 (19.67)

Note. * = significant at $p < .004$, one-tailed, ~~~ = trend significant at $p < .01$, one-tailed, ~ = trend significant at $p < .05$, one-tailed. Note that alpha was set at $p < .004$ with a Bonferroni correction. EXP+EXP is reference category. EXP+EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions.

Table 7
Presence of SoP According to ADIS-C-SoP at the Three Time Points (Completers Only)

	EXP+EXP *n = 16*	COG+EXP *n = 17*	REL+EXP *n = 20*
Pretest			
Presence of SoP	*16* (100%)	*17* (100%)	*19* (95%)
Posttest			
Presence of SoP	*12* (75%)	*14* (82.4%)	*14* (70.0%)
Follow-up			
Presence of SoP	*11* (68.8%)	*9* (52.9%)	*12* (60.0%)

^*n* posttest and at follow-up. SoP = social phobia. EXP +EXP = only exposure sessions, COG+EXP = cognitive and exposure sessions, REL+EXP = relaxation and exposure sessions.

(Ollendick et al., 2015). Yet, because the current study was a microtrial with a small sample size, power was too low to test these potentially important predictors and moderators, which could be better tested in the context of an individual patient data meta-analysis (e.g., Bennett et al., 2013). Also, the study was designed to detect moderate to large differences between conditions, so small or subtle differences could not be detected. Last, although the majority of participants met criteria for social anxiety disorder and reported symptom levels in the clinical range, it remains to be seen if the current findings also generalize to treatment-seeking samples.

Despite these limitations, the current study benefits from several strengths. First, the inclusion of a mid-test assessment of youths' idiosyncratic goals provided us with a more sensitive measure of progress on different dimensions of anxiety, as their idiosyncratic goals were the primary focus of the training. Second, the study was set up as RCT, which is the preferred design in order to gain insight into the most effective and efficient combination of CBT components in the treatment of CADs. Last, by keeping therapy time in all three versions of the training the same, we were able to compare the different combinations of CBT components in a valid way with regard to therapeutic efficiency.

FUTURE RESEARCH

The most parsimonious explanation for the apparent equivalence of a training consisting of four exposure sessions versus a training consisting of two AMS sessions followed by two exposure sessions, is that all CBT components effectively reduced speech anxiety, and thus it does not matter which (combination of) component(s) one chooses. To be able to come to more final conclusions and evidence-based recommendations about the optimal combination of CBT components in the treatment of SoP in youth, future research should replicate the current study while including a half-time assessment of symptoms before adolescents switch components. By this means, the differential efficacy of two sessions of AMS and two sessions of exposure can be assessed, as well as whether two exposure sessions are sufficient to produce a meaningful symptom change without being preceded by AMS or followed by two more exposure sessions. However, to control for delayed effects of the two exposure sessions, this design should be extended with a condition receiving two AMS-only sessions and a condition receiving two EXP-only sessions. In addition, to rule out the effect of order, future studies should ideally switch the sequence of the components, too—for example, by including an EXP+COG and EXP +REL condition.

Regarding alternative explanations for the results, we cannot discard that the small advantage of the exposure-only training on some outcomes was due to a training effect, as adolescents in this condition got more practice in the same component than adolescents in the other conditions, who had to switch components after two sessions. To rule out a training effect and to assess whether AMS without exposure can be responsible for improvement of symptoms, future research should include a cognitive strategies only training (COG +COG) and a relaxation strategies only training (REL+REL) next to an exposure only (EXP +EXP) training. Also, we cannot rule out that the apparent equivalence of the AMS+EXP training and the EXP+EXP training is unique to group-based CBT or to subclinical samples, and not applicable to individual CBT or to clinical samples (Kendall et al., 1997; Whiteside et al., 2015). For socially anxious youth, the group-based format might be an exposure exercise in itself, and subclinically socially anxious adolescents might benefit from such group-based work, while group therapy may be less optimal for clinically socially anxious youth (e.g., Manassis et al., 2002). Future studies should therefore assess the differential efficacy of AMS+EXP and EXP+EXP in an individual format, and include a larger sample of youth referred to mental health care (i.e., a help-seeking sample with 100% of the sample meeting criteria for SoP), preferably including other anxiety disorders and comorbid disorders too, to ensure full generalizability and the opportunity to examine possible predictors and moderators of change.

CLINICAL IMPLICATIONS

Although no firm conclusions can be drawn on the relative efficacy of exposure versus AMS, the results provide some evidence-based recommendations for clinical practice. First, a short group-based CBT training consisting of only five sessions of either psychoeducation followed by four exposure sessions or followed by two AMS sessions and two exposure sessions can be an effective and efficient way to treat speech anxiety in youth. This is underlined by the findings that at follow-up, half of the adolescents scored below the inclusion criterion on the speech anxiety inventory used and half of the adolescents no longer met criteria for SoP. However, whether a short CBT training will be sufficient in the treatment of more generalized SoP or other anxiety disorders remained untested. Second, this study suggests that the different CBT components might not be as specific in their effects as is generally assumed, as all dimensions of anxiety were affected by all three combinations of CBT components assessed in the current study. In addition, given the comparable dropout rates and satisfaction ratings of all versions of the training, it seems unnecessary to combine exposure with AMS. However, the study provided no reasons to stop devoting time to AMS altogether (Craske et al., 2008), as no difference between AMS+EXP and EXP+EXP was found. In fact, our results are in line with previous research in adults suggesting that exposure only treatments are as effective as a combination of exposure with AMS (Norton & Price, 2007).

Conclusion

This study tested whether CBT for SoP might benefit from a strategy where the limited therapy time is only spent on exposure, instead of exposure in combination with AMS like cognitive or relaxation strategies. Results showed that, overall, it seems similarly beneficial to combine exposure with one of these strategies as to use exposure only in treating speech anxiety in youth. More dismantling studies are needed to be able to conclude about the differential efficacy of exposure only versus AMS-only.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

Appendix A. CONSORT 2010 checklist of information to include when reporting a randomised trial*

Section/Topic	Item No	Checklist item	Reported on page No
Title and abstract			
	1a	Identification as a randomised trial in the title	1
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	1
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	2–5
	2b	Specific objectives or hypotheses	5
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	5, 6, 10
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	n/a
Participants	4a	Eligibility criteria for participants	7
	4b	Settings and locations where the data were collected	9
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	8,9
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	10–14
	6b	Any changes to trial outcomes after the trial commenced, with reasons	n/a
Sample size	7a	How sample size was determined	14
	7b	When applicable, explanation of any interim analyses and stopping guidelines	n/a
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	10
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	10

(*continued on next page*)

Appendix A. (*continued*)

Section/Topic	Item No	Checklist item	Reported on page No
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	10
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	10
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	10
	11b	If relevant, description of the similarity of interventions	8,9
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	15,16
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	15,16
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	7,8
	13b	For each group, losses and exclusions after randomisation, together with reasons	7,8
Recruitment	14a	Dates defining the periods of recruitment and follow-up	5
	14b	Why the trial ended or was stopped	n/a
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	7
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	7,8
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	17–23
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	n/a
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	17–23
Harms	19	All-important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	n/a
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	26,27
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	27
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	24–29
Other information			
Registration	23	Registration number and name of trial registry	6
Protocol	24	Where the full trial protocol can be accessed, if available	6
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	1

Appendix B. See Table 7.

References

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