Mindful
Continuing Education

Social Anxiety Disorder in Youth

Subtyping social anxiety in youth

ABSTRACT

Few empirical studies have examined subtypes of social anxiety disorder (SAD) in youth, and limited consensus resides on the nature of potential subtypes. Identifying subtypes, based on both fear and avoidance patterns, can help improve assessment and treatment of SAD.

Subtypes of fear and avoidance were examined in a sample comprising 131 youth (age 8–15 years) diagnosed with SAD using the Anxiety Disorders Interview Schedule for children and parents (ADIS-C/P). Exploratory factor analysis of fear responses revealed three factors, defining fear subtypes linked to: (1) performance, (2) observation, and (3) interaction situations, respectively. Exploratory factor analysis of avoidance responses showed these were best represented by one avoidance factor. Few youth qualified exclusively for either of the fear subtypes, thus calling into question the clinical utility of these subtypes. Nevertheless, the findings indicate distinct contributions of fear and avoidance in SAD presentation. This finding might help clinicians target and improve treatment of the disorder.

1. Introduction

Social anxiety disorder (SAD) is a prevalent mental disorder among youth, with lifetime prevalence reaching 9.2% at the age of 18 years (Merikangas et al., 2010). SAD onset is typically in childhood (Wittchen & Fehm, 2003). Although amenable to treatment, outcome seems to be less favorable for SAD than for other anxiety disorders among youth (Crawley, Beidas, Benjamin, Martin, & Kendall, 2008; Hudson et al., 2015; Wergeland et al., 2016), and SAD is associated with chronicity, psychiatric comorbidity, social impairment, and reduced quality of life (Burstein et al., 2011; Wittchen & Fehm, 2003). Symptoms of social anxiety may be observed in a wide range of social situations, and it is assumed that these situations congregate in discrete domains that trigger underlying fear dimensions, denoted by several researchers as SAD subtypes (Cox, Clara, Sareen, & Stein, 2008; Holt, Heimberg, Hope, & Liebowitz, 1992; Hook, Valentiner & Connelly, 2013). As such, these subtypes do not represent groupings of individuals, but represent manifestations of distinct underlying characteristics and processes that again relate to the fears that individuals with SAD experience within certain fear domains. Identifying content-based subtypes of SAD can facilitate the identification of fear domains and underlying processes in youth with SAD. This may be one step towards improving diagnosis and treatment of the disorder (Bögels et al., 2010 Dalrymple & D'Avanzato, 2013).

The most recent edition of Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013) introduced a content-based *performance*-only specifier (herein denoted as a performance-only subtype), describing fear restricted to public speaking and performance situations (Bögels et al., 2010). Within this categorical perspective it is assumed that individuals with predominantly performance fears are in some way categorically distinct from individuals with predominantly other SAD symptoms. A competing continuum perspective on SAD assumes that differences between affected individuals, is a result of the number of feared, and/or avoided social situations (Bögels et al., 2010). Although the continuum perspective has gained increasing support (Aderka, Nickerson & Hofman, 2012; Crome, Baillie, Slade, & Ruscio, 2010; Vriends, Becker, Meyer, Michael, & Margraf, 2007) the categorical vs.

continuum issue remains debatable (Hook et al., 2013). Furthermore, in the sense that subtypes represent underlying dimensions and processes, there is an increasing recognition of the importance of maladaptive self-deficiency concerns or *core fears* in the development and maintenance of SAD (Moscovitch, 2009 Spence & Rapee, 2016). Such core fears relate to distinct fear situations and contexts in which the patient's perceived deficiencies are at risk of being revealed. These fears are not mutually exclusive or qualitatively distinct, but rather highly correlated and are often present simultaneously (Moscovitch, 2009).

Research on diagnostic subtypes of SAD, including the performance-only subtype in DSM-5, (American Psychiatric Association, 2013; Bögels et al., 2010) has been extensive, yet mainly based on adult samples (Dalrymple & D'Avanzato, 2013). Apart from the performance subtype, two other subtypes have been consistently confirmed across several adult studies, consisting of: (1) fear of social interaction, e.g., talking to strangers, and (2) fear of being observed by others, e.g., eating in public (Bögels et al., 2010; Cox et al., 2008). However, generalization of these findings to youth patients can be problematic, as contextual and developmentally related differences between youth and adults (e.g., living with parents, age related changes in fear profiles and the opportunity for avoidance) are known to influence SAD expression (Rao et al., 2007 Spence & Rapee, 2016; Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004). Therefore, it is relevant and clinically important to explore and compare if SAD subtypes identified in adult populations apply to youth populations.

Recently, two studies with youths have independently assessed rates and correlates of the performance-only subtype in a community and a treatment-seeking sample, respectively (Burstein et al., 2011; Kerns et al., 2013). Although with some discrepancies in subtype definition, Burstein et al. (2011) reported that only 0.7% in a community sample of 10,123 youth fulfilled criteria for a performance-only subtype, while Kerns et al. found no cases of the performance-only subtype in their clinical sample of 204 treatment seeking youth. On this basis, both studies called into question the validity and utility of the performance-subtype. These studies relied on clinically derived definitions of the subtype, as opposed to a statistically derived definition. This presupposes theoretical and preconceived conceptions of the meaning and relationships between fears. Thus, the specific fear situations on which Burstein et al. (2011) and Kerns et al. (2013) base their definition of a performance-only subtype differ. This highlights an important caveat not only in regards to the performance-only subtype, but also in regard to other clinically identified subtypes; which specific situations define the subtypes? The DSM-5 does not help in this concern, offering only a general description of the performance-only fears (American Psychiatric Association, 2013 Dalrymple & D'Avanzato, 2013). This leaves the definition of subtypes open to theoretical preference and interpretation. A statistical approach could help identify not only what situations might define subtypes, but, presupposing these subtypes represent underlying characteristics and processes, this approach might also help identify such dimensions.

In the few studies empirically investigating subtypes of SAD among children and youth, findings are inconsistent regarding the number and definition of identified subtypes. Subtypes identified in youth populations include one (i.e. general factor) (Knappe et al., 2011), two (i.e., interaction and performance; Piqueras, Olivares, & López-Pina, 2008), three (i.e., interaction, performance, and physical and cognitive symptoms associated with social anxiety; Cederlund & Öst, 2013), and five subtypes (i.e., assertiveness, public performance, physical/cognitive symptoms, social encounters, and avoidance; Aune, Stiles, & Svarva, 2008). Similar to most studies on subtypes of SAD in adults, the above mentioned studies differ in terms of population characteristics, assessment methods, and statistical methods, thus complicating both comparison and integration of results. Furthermore, the mentioned studies have specific shortcomings that limit the scope and interpretability of the findings. All the studies use moderately sized to very large populations (N = 108 in Cederlund & Öst, 2013;

N = 3021 in Knappe et al., 2011), yet with the exception of Cederlund & Öst (2013), these are all non-clinical samples. Furthermore, the use of a restricted measure of feared social situations, e.g., assessing only six social situations (Knappe et al., 2011), limits the number of subtypes identifiable. Assessing a broader scope of social situations captures more heterogeneity among fear situations and provides more statistical support in favor of the factors that might be identifiable (Wang & Wang, 2012). Finally, none of the mentioned studies analyzed both youth and parent data regarding the feared situations.

Fear of social situations and avoidance of social situations are core features of SAD (American Psychiatric Association, 2013 Clark & Wells, 1995; Rapee & Heimberg, 1997). However, in previous studies of SAD subtypes in both adults and youth, fear and avoidance have either been equated, or fear alone has been examined (Aderka et al., 2012; Burstein et al., 2011; Kerns et al., 2013; Vriends et al., 2007). A main reason for using such a study design is that avoidance and fear are often highly correlated and thus are assumed to follow the same subtype structure (Heimberg et al., 1999; Oakman, Van Ameringen, Mancini, & Farvolden, 2003). Rapee and Spence (2004), however, proposed that in youth, avoidance develops independently of social fear, in the sense that the typical onset of SAD in early adolescence is reflected in an increase in avoidance rather than any increase in social fear (Rapee & Spence, 2004). Thus, they suggest that the propensity to avoid distressful situations increases more with age than does the level of fear. This argument was supported by Sumter, Bokhorst, and Westenberg (2009) who examined age-related differences of avoidance and fear in youth across three predetermined fear domains. In the situational domain labeled as formal speaking/interactions, they demonstrated that fear and avoidance follow different paths with increased age, with avoidance demonstrating a steeper increase than fear (Sumter et al., 2009). These related yet independent developmental patterns of fear and avoidance might indicate a need for independent assessment of each of these aspects of SAD, and subsequent treatment plans that address each aspect discretely. No study has examined and compared empirically derived subtypes of SAD based on avoidance and fear separately.

In summary, it is unclear if subtypes identified in youth populations are comparable to subtype findings in adult populations. Furthermore, few studies of youth have used data-driven exploratory classification methods to examine and identify content-based SAD subtypes empirically, using broad, established measures of social fear, and assessing both youth and parents scores. No studies of youth have empirically examined the subtype structure of avoided situations and compared these to the subtype structure of feared situations. Thus, the present study aimed to examine empirically derived SAD subtypes based on social situations that are feared and/or avoided among help-seeking youth. Fear and avoidance of situations were assessed using The Anxiety Disorders Interview Schedule, Child and Parent version (ADIS-C/P; Silverman & Albano, 1996).

2. Methods

2.1. Participants

Participants were drawn from the child part of the Assessment and Treatment—Anxiety in Children and Adults (ATACA) study. The study is a randomized controlled trial (RCT) examining the effectiveness of cognitive behavioral therapy (CBT) for anxiety disorders in youth, compared to waitlist, and studying the comparative effectiveness of individual and group CBT delivered in outpatient clinics (Wergeland et al., 2014). Referred youth aged 8–15 years meeting DSM-IV criteria for SAD, separation anxiety disorder and/or generalized anxiety disorder were included. Youth with pervasive developmental disorder, psychotic disorder, severe conduct disorder, and/or mental retardation were excluded. In total, 182 youth were included. Of these participants,

131 youth met DSM-IV criteria for SAD as their primary, secondary or tertiary anxiety disorder, with a mean clinical severity rating (CSR) of 6.7 ($SD = 1.3$), qualifying for inclusion in the present study. Further details on the RCT are provided elsewhere (Wergeland et al., 2014).

Among the included participants ($n = 131$), mean age was 12 years ($SD = 2.0$), 72 participants were girls (55.0%). In addition, the youth had the following comorbid disorders: separation anxiety disorder (50.0%), generalized anxiety disorder (72.5%), major depressive disorder (12.2%), specific phobia (9.9%), tic disorder (7.4%), attention-deficit/hyperactivity disorder (6.9%), oppositional defiant disorder (6.1%), obsessive–compulsive disorder (1.5%), eating disorder (1.5%), post-traumatic stress disorder (0.8%), and panic disorder with or without agoraphobia (0.8%). The mean number of comorbid anxiety disorders was 1.2 ($SD = 0.7$), while mean number of all comorbid mental disorders was 1.7 ($SD = 1.0$). The majority of the youth were Caucasian (90.8%), two were Asian (1.5%), and ethnicity was not reported for 11 participants (8.4%). The majority of the children lived in two-parent households (56.5%), 20.6% in a single-parent household, 13% in a household with one biological parent and one step-parent, and 1.5% in foster care. Family composition was unknown for six participants (4.6%). The occupational status of the parents was classified into rank-ordered social classes, in accordance with the Registrar General Social Class coding scheme (Currie et al., 2008). The family social class was defined by the highest ranking parent. Family social class was high for 29.0%, middle for 50.4%, and low for 9.2%. Social status was unknown for the remaining 11.5%.

2.2. Procedure and assessment

2.2.1. Diagnostic interview

The Anxiety Disorders Interview Schedule, Child and Parent version (ADIS-C/P; Silverman & Albano, 1996) was used to assess inclusion diagnoses. ADIS-C/P is a semi-structured diagnostic interview assessing child psychopathology according to the DSM-IV criteria (American Psychiatric Association, 2000). In the current study, only the interview modules for separation anxiety disorder, social anxiety, and generalized anxiety disorder were used. Children and parent(s) were interviewed separately, and the child- and parent-rated diagnosis and clinician's severity rating (CSR) were combined into a composite score (Silverman & Albano, 1996). The CSR scale ranges from 0 to 8, and a CSR of 4 or above is the threshold of the disorder (Silverman & Albano, 1996). The ADIS-C/P has demonstrated excellent inter-rater reliability, retest reliability, and concurrent validity (Lyneham, Abbott, & Rapee, 2007). In the current study, all diagnostic interviews were video-recorded. A random selection of 20% of these interviews was re-coded by expert raters blind to the assessor's initial rating. Inter-rater agreement for SAD diagnosis was excellent ($k = 0.83$), and CSR ICC for SAD was 0.72.

The SAD module of the ADIS-C/P interview covers 23 situations in which youth may experience fear and/or show avoidance. If fear is confirmed, the child/parent is asked to rate the degree of fear experienced in relation to the specific situation, on a scale from 0 to 8. If the fear rating is 4 or above, the child/parent is asked to indicate whether the child avoids or endures the situation with considerable distress. Avoidance is scored as either "present = 1" or "not present = 0". The separate child and parent fear and avoidance ratings were combined into integrated scores. Thus, the highest fear rating, and presence of avoidance endorsed by either the child *or* the parent was carried forward into the integrated scores.

2.2.2. Interviewers

The study was conducted at seven public mental health outpatient clinics, servicing children and adolescents in Western Norway and covering both rural and urban areas. Interviews were performed by clinicians ($N = 17$) employed at the participating clinics. These clinicians attended specific training for the ADIS-C/P in a two-day work-shop with experienced ADIS-C/P raters and also received supervision of interviewers throughout the three-year inclusion period (2008–2011).

2.3. Statistical analyses

To investigate the existence of SAD subtypes based on the ratings of feared and avoided situations, we performed separate exploratory factor analyses (EFA) of the fear and avoidance items using structural equation modeling (SEM). SEM-based EFA determined the number of continuous latent variables needed to explain the correlations among the observed variables. Given the assumption that subtypes represent underlying processes and dimensions (Moscovitch & Huyder, 2011), we assumed them to be correlated, and for which reason we used an oblique rotation. An item was considered to load on a given factor if the factor loading for the item was greater than, or equal to, 0.30.

We examined the distribution of youth within the identified subtypes, and we examined whether youth with different SAD subtypes differed in age and SAD severity, using analyses of variance (ANOVAs) and correlation analyses ($p < 0.05$).

Apart from the item "going on dates", none of the 23 fear/avoidance situations had missing answers exceeding 0.5% in total. The item "going on dates" was not used in the factor analyses, as this item in many cases was deemed inappropriate by the interviewer, given the age of the participants—two-thirds of the participants were 12 years old or younger. The item "other situations" was also excluded in the analyses, given the high heterogeneity in answer content. Little's missing completely at random (MCAR) test was non-significant, indicating data were missing completely at random. The missing data were accounted for by full information maximum likelihood missing data methodology (Wothke, 2000).

The program Mplus, version 7.31 (Muthén & Muthén, 2015), was used for the factor analyses, while the program SPSS 22 was used for the other analyses. The ratings of avoidance for the 21 items are binary, for which a weighted least squares means and variance estimator (WLSMV) is considered appropriate (Wang & Wang, 2012). In Mplus this variable is estimated as a tetrachoric correlation (Muthén & Muthén, 2015). This strengthens correlations and factor loadings, thus providing better identification of factors and reducing the negative impact (unbiased) on the factor outcome of the avoidance variable.

The answers to the fear items from the SAD section in the ADIS-C/P interview were non-normally distributed, mainly due to "zero" answers (i.e., no fear score, as no fear was confirmed). Therefore, a censored model was estimated with the maximum likelihood robust (MLR) estimator (Muthén & Muthén, 2015). A consequence of censoring is that commonly used goodness of fit indexes, such as root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker Lewis fit index (TFI), cannot be used (Muthén & Muthén, 2015; Wang & Wang, 2012). Instead, Akaike information criterion (AIC) and sample size adjusted Bayesian information criterion (SABIC) were used to compare model fit (Yang, 2006).

2.4. Ethics

The study was approved by the Regional Committee for Medical and Health Research Ethics for Western Norway.

3. Results

3.1. Frequency of fear and avoidance

Out of a maximum of 21 feared situations, the mean number of situations receiving a fear score of 4 or higher was 10.0 ($SD = 4.2$, range 1–19) (Table 1). The mean number of avoided situations (when fear is present and rated 4 or higher) was 8.4 ($SD = 3.8$, range 1–18). The correlation between the number of clinical feared situations (fear

Table 1
Percentage that fear a situation, percentage that avoid a situation and mean clinical severity rating among youth with SAD (n = 131).

Item number	Situation	Confirmed fear[a]	Confirmed avoidance[b]	Mean fear score
2	Giving a report or reading aloud in front of the class	75%	73%	6.7
14	Musical or athletic performances	73%	63%	6.4
1	Answering questions in class	62%	51%	6.0
5	Writing on the chalkboard	45%	39%	6.0
17	Talking to persons you don't know well	71%	65%	5.8
9	Starting or joining in on a conversation	60%	56%	5.4
16	Speaking to adults	53%	44%	5.4
3	Asking the teacher a question or for help	51%	45%	5.7
21	Being asked to do something that you really don't want to do, but you can't say no	51%	44%	5.1
12	Meetings such as girl or boy scouts or team meetings	34%	30%	5.8
15	Inviting a friend to get together	33%	26%	5.4
13	Answering or talking on the telephone	28%	24%	5.3
18	Attending parties, dances, or school activity nights	50%	35%	5.6
6	Working or playing with a group of kids	47%	34%	5.3
7	Gym class	39%	31%	5.8
8	Walking in the hallways or hanging out by your locker	37%	29%	5.4
11	Eating in front of others	21%	18%	5.4
4	Taking tests	44%	24%	5.3
10	Using school or public bathrooms	37%	37%	5.8
19	Having your picture taken	21%	16%	5.2
22	Having someone do something to you that you don't like, but you can't tell them to stop	62%	56%	6.1

[a] Confirmed fear is the percentage of clinical fear, i.e. fear score ≥ 4.
[b] Only rated if fear ≥ 4.

scores 4–8) and avoided situations was $r = 0.93$ ($p < 0.001$). Age was positively associated with sum of feared situations ($R^2_{adj} = 0.14$, $F(1, 129) = 22.6$; $p < 0.01$) and sum of avoided situations ($R^2_{adj} = 0.17$, $F(1, 129) = 27.7$; $p < 0.01$). There were significant gender differences regarding the sum of feared situations ($t(131) = -2.36$; $p < 0.05$) and avoided situations ($t(131) = -2.18$; $p < 0.05$), with girls displaying more fear and avoidance. There were no significant gender differences in relation to overall SAD severity ($t(131) = -1.53$; $p > 0.05$) or comorbid disorders ($t(131) = -1.68$; $p > 0.05$).

There were no significant correlations between social class and, respectively, SAD severity ($r = -0.07$; $p > 0.05$), feared situations ($r = -0.05$; $p > 0.05$), or avoided situations ($r = -0.08$; $p > 0.05$). There was no significant correlation between social anxiety severity and number of comorbid disorders ($r = 0.13$; $p > 0.05$).

The three most prevalent feared and avoided situations, confirmed among more than two-thirds of all the participants (71%), were "giving a report or reading aloud in front of the class" (n = 98), "musical or athletic performances" (n = 96), and "talking to a person you don't know well" (n = 93). Apart from talking to unfamiliar people, these situations relate to performance-type situations. The three least prevalent feared situations, confirmed by less than one-third of all participants (30%), were "answering or talking on the phone" (n = 37), "eating in front of others" (n = 28), and "having your picture taken" (n = 28). The latter two situations relate to observational-type situations.

3.2. Exploratory factor analysis of feared situations

Comparison of factor models of fear situations, based on their chi-square value difference, indicated significant improvement of model fit with each of the three first factors added. The AIC and SABIC criteria (Table 2) indicated that a four-factor model did not improve the model fit, although a five-factor model did. The interpretability of this five-factor model was, however, deemed poor – no apparent conceptual or clear domain coherence seemed to characterize the model (Wang & Wang, 2012). A three-factor solution was considered to provide the best statistical fit and conceptual coherence. Factor loadings are presented in Table 3. The labels "performance", "observation", and "interaction" were considered the most appropriate fitting labels for the domains. The correlation between the performance and observation factor was $r = 0.25$, between the performance and inter-

Table 2
Comparison of fear models based on AIC and SABIC criterion.

Models compared	AIC[a]	SABIC[b]
1-factor against 2-factor	56	62
2-factor against 3-factor	26	32
3-factor against 4-factor	−7	−2
4-factor against 5-factor	30	35

[a] AIC: Akaike information criterion.
[b] SABIC: Sample Size adjusted information criterion.

action factor $r = 0.29$, and between the interaction and observation factor $r = 0.43$, all non-significant ($p > 0.05$).

3.3. Exploratory factor analysis of avoided situations

The chi-square value difference indicated that a two-factor model of avoided situations added significantly increased goodness of fit ($p = 0.049$), compared to a one-factor model, while models with an increasing number of factors did not significantly improve the model fit ($p > 0.05$). This factor model is presented in Table 4. However, both models achieved close fit as measured by root mean square error of approximation (RMSEA): one-factor model $RMSEA = 0.028$, two-factor model $RMSEA = 0.019$. As is the case in all factor models, the factors need to be meaningful and interpretable (Wang & Wang, 2012). No clear cut domain coherence seemed to characterize the two-factor solution. Both factors contained items that overlapped in content and characteristics. For instance, item 3 "asking the teacher a question or for help", and item 1 "answering questions in class" are similar in content yet load on different factors. Given these aspects, a unifactorial parsimonious model was considered to provide the most adequate fit.

3.4. Distribution of youth within the identified subtypes

Table 5 summarizes the distribution of youth within the different subtypes and the total number of subtypes the youth falls within. An increase in the number of subtypes the youth confirmed was associated with an increase in age and clinical severity, although only significantly in the case all three subtypes were present.

Table 3
Exploratory factor analysis with oblique rotation of social situations feared among children with SAD (N = 131).

Item Number	Situation	Factors		
		Performance	Observation	Interaction
5	Writing on the chalkboard	**0.80**		
2	Giving a report or reading aloud in front of the class	**0.79**		
1	Answering questions in class	**0.76**		
14	Musical or athletic performances	**0.44**		
8	Walking in the hallways or hanging out by your locker		**0.80**	
7	Gym class		**0.61**	
6	Working or playing with a group of kids		**0.53**	
18	Attending parties, dances, or school activity nights		**0.49**	
11	Eating in front of others		**0.48**	
16	Speaking to adults			**0.92**
17	Talking to persons you don't know well			**0.56**
3	Asking the teacher a question or for help	0.40		**0.50**
12	Meetings such as girl or boy scouts or team meetings			**0.48**
13	Answering or talking on the telephone			**0.40**
15	Inviting a friend to get together		0.32	0.40
20	Being asked to do something that you really don't want to do, but you can't say no			**0.38**
9	Starting or joining in on a conversation	0.30		0.35
19	Having your picture taken		0.29	
21	Having someone do something to you that you don't like, but you can't tell them to stop		0.26	
4	Taking tests	0.25		
10	Using school or public bathrooms		0.10	

Note. Cutoff for retaining factor loadings in table is set at 0.30. Loadings for items 4, 10, 19 and 22 are included in the table, so as to indicate which factor they loaded the strongest on. Numbers in bold are significant at 5 % Level.

Table 4
Exploratory factor analysis with oblique rotation of social situations avoided among children with SAD (N = 131).

Item Number	Situation	Factors	
		1	2
6	Working or playing with a group of kids	**0.83**	
3	Asking the teacher a question or for help	**0.64**	
20	Being asked to do something that you really don't want to do, but you can't say no	**0.64**	
16	Speaking to adults	**0.63**	
21	Having someone do something to you that you don't like, but you can't tell them to stop	**0.60**	
9	Starting or joining in on a conversation	**0.57**	0.40
18	Attending parties, dances, or school activity nights	**0.52**	
7	Gym class	0.36	
12	Meetings such as girl or boy scouts or team meetings	0.33	
17	Talking to persons you don't know well	0.32	
10	Using school or public bathrooms		**1.00**
19	Having your picture taken		**0.79**
11	Eating in front of others		**0.74**
2	Giving a report or reading aloud in front of the class		**0.73**
1	Answering questions in class		**0.65**
15	Inviting a friend to get together		**0.49**
4	Taking tests		**0.46**
5	Writing on the chalkboard		0.38
8	Walking in the hallways or hanging out by your locker		0.36
13	Answering or talking on the telephone		0.32
14	Musical or athletic performances		0.32

Note. Cutoff for retaining factor loadings in the table is set at 0.30. Loadings for item 9 are included in the table so as to indicate which factor it loads the strongest on. Numbers in bold are significant at 5 % Level.

3.5. Subtypes, avoidance and relation to age

To test whether age had differing associations with the identified fear subtypes, ANOVAs were conducted. The analyses demonstrated significant and differing age-explained proportions of fear variances with the three subtypes: performance subtype: $R^2_{adj} = 12.4$, $F(1, 129)$ = 19.34, $p < 0.01$; interaction subtype: $R^2_{adj} = 7.5$, $F(1, 129)$ = 11.61, $p < 0.01$; and observation subtype: $R^2_{adj} = 12.1$, $F(1, 129)$ = 18.70, $p < 0.01$. For all subtypes, older youth demonstrated higher fear scores than younger youth. Avoidance similarly increased with age ($R^2_{adj} = 17.1$, $F(1, 129) = 27.7$; $p < 0.01$), and showed a stronger association with age than fear.

4. Discussion

Using a broad, well-established measure assessing 21 social anxiety situations, it was possible to distinguish three distinct content-based subtypes of SAD among clinically referred youth. The subtypes were labeled "performance", "observation", and "interaction", representing three non-significantly correlated fear dimensions. These findings are somewhat different to other empirical results in studies of SAD subtypes among children and youth, although in line with results among adult studies. Our findings did not support the utility of the DSM-5 performance- only subtype (American Psychiatric Association, 2013). The factor analysis of avoidance provided a one-factor solution as the best fitting model, conceptually and statistically. The three subtypes demonstrated varying age associations and age was also differentially associated with sum of feared situations and sum of avoided situations. On this basis we argue that fear and avoidance capture discrete aspects of SAD, in accordance with recent social anxiety theory (Spence & Rapee, 2016). This distinction may prove important regarding assessment and treatment.

The identified SAD subtypes of performance and interaction are consistent with those identified in youth by Piqueras et al. (2008) and Cederlund and Öst (2013), with exception of the subtype "observation". Aune et al. (2008) similarly identified a performance subtype, yet also four other dissimilar subtypes not identified in this study. Furthermore, Knappe et al. (2011) identified a single general type. This lack of comparability may relate primarily to methodological differences, such as assessment instrument used and population composition (age, comorbidity, community versus clinical) (Dalrymple & D'Avanzato, 2013; Hofmann, Heinrichs, & Moscovitch, 2004). These diverging differences challenge comparison and integration of the results.

A central discussion is the comparability and also applicability of adult findings to youth populations (and vice versa). At face value, the

Table 5
Number of participants experiencing fear within subtypes and clinical differences.

Number of subtypes	Total N	Individuals with subtype			Mean/(SD) comorbid	Mean	Total clinical
		Performance	Observation	Interaction	anxiety disorder	age/(SD)	severity rating
One subtype	6	2	1	3	1.33 (0.82)	10.33 (1.63)	5.50
Two subtypes	24	20	5	23	1.30 (0.77)	10.88 (1.94)	6.00
Three subtypes	101	101	101	101	1.21 (0.73)	12.31 (1.96)[a]	6.90[b]

[a] Significant difference compared to one and two subtypes at p < 0.05. One subtype; $t(105) = -2.42$; two subtypes; $t(123) = -3.23$.

[b] Significant difference compared to one and two subtypes at p < 0.01. One subtype; $t(105) = -2.92$; two subtypes; $t(123) = -3.94$.

three identified subtypes, performance, interaction, and observation, are congruent with the examples of situational domains of social anxiety given in Criteria A of the disorder in DSM-5 (American Psychiatric Association, 2013) and adult studies on SAD (Cox et al., 2008). However, this does not necessarily imply that the identified social dimensions are the same: the contextual differences between children and adults vary, as well as cultural, personal, developmental and environmental factors, that all influence and contribute to the fears that a youth or an adult experiences in social situations (Spence & Rapee, 2016 Weems & Costa, 2005). More specifically in relation to the performance subtype, Bögels et al. (2010) argued that children are not expected to "perform" or undergo public formal evaluations until the adolescent years. However, in our study, the items loading onto the performance subtype consisted of primarily school activities that *are* expected, even in the early grades (see Table 3 for details on the specific situations loading onto the subtype). These situations are very much performance-related, and the youth is subject to public (co-pupil) formal evaluations in these situations. Thus, the specific content of a "public" situation differs from adults in regards to the *setting* and the *observers*. Such differences in the defining content characteristics of the subtypes among youth, would also apply to the subtypes interaction and observation, in comparison to adults. This means that any comparison and application of a subtyping scheme across age groups must inevitably accommodate such differences in context and environment. Specifically regarding the performance-only subtype as defined in DSM-5 (American Psychiatric Association, 2013) we would argue this definition does accommodate such content differences. Our findings provide more detailed information on the defining context characteristics of the subtype in a youth population, which naturally differs from adults.

Statistically, our results support the existence of a performance subtype in the sample. Although we relied on an oblique rotation, thus violating the criteria of exclusivity inherent in the definition (American Psychiatric Association, 2013), the results nevertheless demonstrated a small non-significant correlation between the performance factor and the other two factors, indicating a near orthogonal (non-correlated) solution. We therefore argue that the identified model does speak to the DSM-5 performance subtype, adding construct validity to this subtype. However, when counting how many youth in fact exclusively met criteria for the subtype in the sample, we identified only two individuals. Accepting some discrepancy between definitions of the subtype, this finding is in line with that of Kerns et al. (2013) and Burstein et al. (2011), who similarly sought to identify the number of individuals fulfilling criteria for the performance-only subtype. Both studies identified similar low numbers. Thus, these results pose a serious challenge to the validity and utility of the subtype. Regarding the observation and interaction subtypes, we identified respectively one and two youths who exclusively feared situations within these subtypes, warranting the same conclusion.

The majority of the youth (78%) in our study feared situations in all three subtypes. Similarly, Kerns et al. (2013) classified 64% of their sample to fear situations, covering all three fear domains, while Burstein et al. (2011), found that 56% of their sample feared more

than 7 out of 12 fear situations assessed. The larger proportion of youth with multiple fears in our study may be ascribed to the greater severity of the SAD disorder among the participants drawn from community clinics compared to the university-based clinical sample in the Kerns et al. (2013) study. Mean CSR score of our sample was 6.7 (*SD* 1.3) and mean CSR in the Kerns et al. (2013) study was 5.3 (*SD* not reported). In extension of this, our results indicated a significant relationship between mean CSR rating and number of subtypes the individual confirmed, in comparison to individuals confirming fewer subtypes (Table 5). Similarly age was positively associated with an increase in the sum of fears and avoidance. Taken together, these results can indicate that as the child and youth grow older, the intensity and severity of the disorder increases and (s)he is more likely to experience fear across several domains.

Concerning the different relationships between age and fear within the subtypes, the performance and observation subtypes demonstrated a similar and stronger age association than the interaction subtype. An explanation for this increase could be a change in the fears towards more social evaluative fears in the older youth versus the younger youth (Weems & Costa, 2005). As such, performance and observational situations possess more evaluative aspects than interactional situations. Girls in general exhibit more fear and SAD symptoms than boys (Rao et al., 2007; Beidel and Alfano, 2005), and Essau, Conradt, and Pettermann (1999) found that girls reported more fears than boys, in regards to the situation involving "doing something in front of people". The situations within the performance and observation subtypes all involve activities in front of others. This could help explain the finding that girls feared more situations than boys.

In sum, the current evidence supporting the validity and utility of content-based subtypes in youth is meager, thus questioning the use of these subtypes. A basic assumption in our study was that subtypes are not groupings of individuals, but represent underlying characteristics or processes relating to maladaptive self-deficiency concerns. Two recent theories of social anxiety state, that a core defining feature of the disorder is a "distorted, negative view of self" denoted *core fears* (Moscovitch, 2009) or described as maladaptive beliefs about the self (2016), regarding attributes and likeableness. These self-characteristics are perceived as deficient and at odds with perceived societal expectations and norms (Moscovitch, 2009), and are thought to have a detrimental effect on the individual, if exposed to public scrutiny or critical others. These core fears fall into three broad correlated dimensions: 1) concerns about social competence; 2) concerns about physical appearance; 3) concerns about revealing anxiety symptoms (Moscovitch & Huyder, 2011). The results of our factor analysis seem to match the fear triggers and the fear domains, to which these core concerns map onto, that is: social competence – interaction subtype; physical appearance- observation subtype; revealing anxiety symptoms – performance subtype. On this basis, we hypothesize that these core beliefs are the underlying processes that result in the confirmed distribution of social anxiety subtypes we identified. Uncovering and classifying these possible underlying core fears via subtype identification, may help classify and better tailor the treatment to these individual differences that are expressed through the specific fears of the individual.

In the analysis of possible SAD subtypes based on avoided situations, a uni-dimensional solution was assessed as the best fitting model. As such and in comparison to fear subtypes, avoidance of social situations is not situationally bound but is better described as a behavior more or less present across feared social situations. Thus, the avoidance factor is more in line with a continuum model of social anxiety (sum of fear and avoidance predicts severity), whereas fear subtypes comply with a categorical perspective. This finding is relevant to the continuum vs. categorical debate within the subtype discourse. The finding highlights that it is perhaps not a question of the eligibility of one perspective over the other, but rather *within* which *areas* a continuum versus categorical model can be best suited to describe and understand the heterogeneity of the disorder. In extension of this, we can thus assume that avoidance is a generalizable behavior across the feared situations of an individual, whereas the fear reaction or distress pertaining to the identified domains is not generalizable across subtypes.

We found that avoidance increased with age, similarly to the sum of fears, although fear develops at differing rates within the different subtypes. This can be interpreted as evidence that fear and avoidance tap into different aspects of SAD, and that fear and avoidance follow related, yet distinct, paths in relation to age. This argument is supported by the findings of Sumter et al. (2009) that demonstrated unique developmental paths of fear and avoidance within SAD subtypes. Rao et al. (2007) also suggested that different developmental paths of fear and avoidance relate to the youth's opportunity for avoidance, which they argue increases with higher age. These findings are also in accordance with general SAD theory (Spence & Rapee, 2016), stating that avoidance not only is a reaction to fear, but also contributes to a strengthening of fear, by minimizing the opportunity of disconfirmation of underlying automatic thoughts.

4.1. Limitations

Certain limitations of our study warrant comment. Our results are based on a sample of treatment-seeking youth with SAD and may therefore not be generalizable beyond similar populations. Further research will be needed to assess if the identified factor structures are generalizable to other samples. Concerning assessment of the conceptually best fitting model in regards to both fear and avoided situations, this assessment relies in some part on interpretation of item commonalities and factor coherence. We assessed that avoidance is best represented by one factor, as the two-factor solution proved difficult to interpret. However, this assessment and conclusions drawn from it should be considered with caution, given that other interpretations are possible.

We hypothesize that the underlying distinct processes responsible for the division into three manifest SAD subtypes can be core fears, or concerns pertaining to maladaptive self-concerns. We did not in this study investigate these core fears more specifically, leaving this hypothesis open for further investigation. Regarding adequate sample size in SEM analysis, there are no absolute standards. The EFA analysis performed is based on a sample size of 131, i.e., between recommendations given in the literature (N = 100 to N = 200), for which reason the statistical power of the analysis might be somewhat reduced (Wang & Wang, 2012). Further studies are needed to confirm the identified factor structures. The ADIS-C/P interview assesses avoidance of social situations when fear of a social situation is rated "4" or above. Thus, some avoided situations might not have been assessed, given that the fear rating was below the cutoff. Accordingly, we cannot rule out that a given situation has a low fear rating because the situation is avoided. This is an inherent limitation in the ADIS-C/P interview, thus also of our results. We did not have behavioral observation data available to confirm the existence and degree of avoidance reported by the child and parent.

4.2. Clinical implications

Our findings may contribute with important information when planning and delivering therapy. In terms of treatment planning, it may be important to assess avoidance separately from fear. Youth with anxiety problems may under-report their fears because they consistently avoid feared situations. Assessing avoided situations independently from feared situations, e.g., as separate domains in an interview or with different questionnaires, may elicit this information for better targeted treatment. In terms of treatment delivery, results from generic programs designed for several anxiety disorders may improve if the exposure tasks involved deal with the associated automatic thoughts within the separate fear domains rather than across a spectrum of social anxiety situations. Furthermore, in the case our hypothesis is confirmed, that subtypes do reflect underlying differences in maladaptive core self-concerns, Moscovitch & Huyder (2011) similarly state that treatment response varies in relation to these concerns. This entails that treatment should be tailored to the specific core fears. Thus, addressing and focusing on both the specific fears and underlying maladaptive self-beliefs, alongside the behavioral component consisting of avoidance, may prove effective in assessment and treatment delivery.

5. Conclusions

The present study identified three distinct content-based subtypes of SAD in treatment-seeking youth: performance, observation, and interaction. These subtypes are similar to those reported in adult studies and partly in youth studies, even though only the performance subtype is formally accepted (American Psychiatric Association, 2013). Although the results confirm the existence of a performance-only subtype, very few youth qualify for the subtype, calling into question the validity and utility of this subtype. Avoidance does not follow the same factor structure as the fear domains. Rather fear and avoidance seem to follow distinct paths also in relation to age, indicating unique contributions to the disorder. Careful assessment of possible subtypes could allow for more targeted treatment given that treatment gains are most likely not generalizable across the subtypes, as the subtypes might represent distinct underlying core fears. This is most likely not needed regarding avoidance, which, given a unitary structure, can be addressed independently of the situation in which the behavior is present.

Future investigations of subtypes in youth should include broader populations and differentiated outcome results in relation to fear subtypes and avoidance. Further analysis of the hypothesized link between subtypes and underlying core fears would allow for more thorough identification and understanding of the processes involved in the development and maintenance of SAD. Information of subtypes could inform assessment and treatment of youth and adults with SAD.

Young children have social worries too: Validation of a brief parent report measure of social worries in children aged 4–8 years

ABSTRACT

This study investigated the psychometric properties of the Social Worries Anxiety Index for Young children (SWAIY), adapted from the Social Worries Questionnaire—Parent version (SWQ-P; Spence, 1995), as a measure of social anxiety in young children. 169 parents of children aged four to eight years from a community sample completed the SWAIY and a standardized measure of anxiety; the SWAIY was completed again two weeks later. Parents deemed the items appropriate and relevant to children of this age. The SWAIY demonstrated excellent (> 0.80) internal consistency and a one-factor model. Test-retest reliability was strong ($r = 0.87$) and evidence of convergent validity ($r > .50$) was found. The study provides initial evidence for the validation of SWAIY as a measure of social anxiety in children aged four to eight years old. This questionnaire is ideal for investigating social anxiety over early childhood and the relationship between early social worries and later anxiety disorders.

1. Introduction

Social anxiety disorder often begins in early adolescence (Kessler et al., 2005) yet symptoms of social anxiety have been identified much earlier in childhood. Between 2.1% to 4.6% of pre-schoolers in non-psychiatric samples meet criteria for social anxiety disorder (Egger & Angold, 2006). Although social anxiety affects the wellbeing and achievements of children in the short term and in later life (Copeland, Angold, Shanahan, & Costello, 2014; Ginsburg, Silverman, & La Greca, 1998), we currently know little about the specific manifestations of social anxiety in young children or about the stability and development of social anxiety over childhood (Spence et al., 2001). While several anxiety assessments for older children include a social anxiety subscale, to our knowledge there is currently no stand-alone measure of social anxiety for children younger than eight years. The present study therefore reports on the adaptation and validation of the Social Worries Questionnaire—Parent version (SWQ-P; Spence, 1995) into the Social Worries Anxiety Index for Young children (SWAIY), a brief parent-report measure of social anxiety that is appropriate for young children.

Social anxiety is characterised by an intense and irrational fear of embarrassment in social situations (Alkozei, Cooper, & Creswell, 2014). For a DSM-5 diagnosis of social anxiety, a child must respond to these situations with avoidance or distress that interferes significantly with day-to-day functioning (American Psychiatric Association, 2013). Social anxiety in childhood is associated with a range of negative correlates both concurrently and prospectively. For example, children with social anxiety have difficulties with social competence (Ginsburg, Silverman, & La Greca, 1998; Spence, Donovan, & Brechman-Toussaint, 1999) and poorer functioning at school (Mychailyszyn, Mendez, & Kendall, 2010). In eight and nine year olds, social anxiety is negatively associated with friendship and positively associated with peer victimisation (Larkins, 2014; Slee, 1994), specifically overt victimisation (verbal or physical aggression; Storch, Zelman, Sweeney, Danner, & Dove, 2002). Furthermore, social anxiety during childhood is associated with poor mental health in adulthood (Copeland et al., 2014).

Social anxiety can be diagnosed as distinct from other anxiety disorders in children as young as 4–5 years (; e.g. Ford, Goodman & Meltzer, 2017; Shamir-Essakow, Ungerer & Rapee, 2005 ;). Further, factor analysis of parent-report scales such as the Preschool Anxiety Scale (PAS; Spence, Rapee, McDonald, & Ingram, 2001) shows that items related to social anxiety can be differentiated from items related to other common anxiety problems in young children such as separation anxiety disorder. A recent population-based study found a prevalence rate of 10.7% for social anxiety disorder amongst 4–8 year olds (Paulus, Backes, Sander, Weber, & von Gontard, 2015). Despite the potential negative consequences and high prevalence, research investigating social anxiety in early childhood is rare (e.g. Kingery, Erdley, Marshall, Whitaker, & Reuter, 2010; Morris et al., 2004). It is known that the incidence of social anxiety increases with age (Hitchcock, Chavira, & Stein, 2009), yet we know little about the stability and development of social anxiety within individuals, from early childhood. Initial research suggests that early social anxiety may indicate risk

for emotional health problems across childhood. For example, Bufferd and colleagues found that a diagnosis of social anxiety at age 3 years predicted social anxiety disorder and specific phobia 3 years later (Bufferd, Dougherty, Carlson, Rose, & Klein, 2012). Furthermore, Carpenter et al. (2015) found that a history of preschool social anxiety predicted less functional connectivity between the amygdala and ventral frontal cortices when children viewed angry faces (Carpenter et al., 2015), indicating a potential difficulty with emotion regulation.

These examples highlight the potential that research examining social anxiety in young children holds for furthering our understanding of the development of anxiety across childhood. However, to conduct this type of work with young children it is imperative that we have valid and reliable measures of social anxiety for this age group that can be administered quickly and easily. Whilst diagnostic assessments such as the Preschool Age Psychiatric Assessment (PAPA; Egger & Angold, 2004) used by Bufferd et al., 2012; and the Anxiety Disorders Interview Schedule (ADIS; Silverman & Nelles, 1988) are the gold standard, they are not always practical given the time and resources required to train assessors and carry out the interviews. Currently, the only available questionnaire measure of social anxiety in early childhood is a subscale of the PAS; other subscales include generalized anxiety, separation anxiety, obsessive compulsive disorder and physical injury fears. The PAS was developed as a parallel measure of the Spence Children's Anxiety Scale (SCAS; Spence, 1998), which measures anxiety symptoms in children aged 7–18 years. The PAS is not ideal for capturing social anxiety for two reasons. First, the social anxiety scale, which consists of six items, is not designed as a stand-alone measure so many additional items (a further 22 items) must be completed unnecessarily. Second, the PAS includes many cognitive items i.e. "Worries that he/she will do something to look stupid in front of other people". Due to the 'hidden' nature of cognitions and the broad context of the questions, it may be difficult for parents to accurately respond to these items (Comer & Kendall, 2004).

In contrast, the SWQ-P is a brief (10-item) parent-report measure of social anxiety in 8–17 year olds. All items load onto a single 'social worries' factor. The items focus on specific situations and observable behaviours e.g. "Avoids or gets worried about entering a room full of people". As avoidance is more easily observed than cognitive symptoms and specific situations are given, parents should be able to provide more accurate report than on the PAS. Given this advantage of the SWQ-P as a parent-report measure, it is an attractive candidate for adaptation into a measure of social anxiety for a younger age group (children aged 4–8 years) for whom no specific measure of social anxiety currently exists. Such a measure will provide a valuable new tool for gathering information about social anxiety within this age group. The original SWQ-P has been acknowledged as a useful prescreening tool for social anxiety in children (Hitchcock et al., 2009) and the adapted version may also assist researchers and clinicians in this way. Beyond this, the adapted measure would be useful, as discussed, for addressing questions regarding the stability of social worries over childhood and the role of early social worries in the development of anxiety disorders later in life. This research may then, in turn, have implications for the prevention and early treatment of social anxiety in children.

In the present study, we describe the adaptation of the SWQ-P into the Social Worries Anxiety Index for Young children (SWAIY) and assess the content validity, test-retest reliability, convergent validity and internal reliability of the new measure as well as examining the internal structure through factor analysis. These investigations contribute to assessment of the questionnaire's construct validity.

2. Materials and method

2.1. Participants

Data was collected via online questionnaires. To be included as a study participant at either time 1 or time 2, full data was required for the SWAIY and basic demographics. This resulted in a sample of 169 parents (166 female) at time 1 and 106 (105 female) at time 2. An additional eight parents at time 1 and six parents at time 2 only partially completed the online questionnaires and were therefore excluded.

Parents completed questions about their child. At time 1, 99% considered themselves the child's primary caregiver. Children's ages ranged from 3.92 to 8.92 years old ($M = 6.25$, $SD = 1.29$, 4 year olds = 38, 5 year olds = 35, 6 year olds = 41, 7 year olds = 36, 8 year olds = 23), 81 of the children were female. No differences in age were found between male and female children ($t(167) = 0.711$, $p = 0.75$). No children were reported as having a diagnosis of Autistic Spectrum Disorders (ASD) or learning difficulties but two were reported as having ADHD. These children did not appear as outliers on any of the variables of interest and analyses were consistent when these children were excluded thus their data is included in the analyses reported. Note that details regarding ASD and learning difficulties were collected due to the potential social difficulties that these children might experience which could affect parents' responses on the questionnaires of interest (Kreiser & White, 2014).

At Time 2, 106 of the original 169 parents completed the online questionnaire for a second time. The same parent answered the questionnaire at both time points. At this point, 98% of parents stated they were the child's primary caregiver. Children's ages ranged from 3.92 to 8.92 years old ($M = 6.20$, $SD = 1.32$, 4 year olds = 23, 5 year olds = 22, 6 year olds = 28, 7 year olds = 22, 8 year olds = 14) and 52 were female. No differences in age were found between genders of the children ($t(104) = 1.03$, $p = 0.305$). No children were reported as having a diagnosis of ADHD, ASD or learning difficulties.

2.2. Measures

2.2.1. Spence Child Anxiety Scale—Parent version (SCAS-P) and Preschool Anxiety Scale (PAS)

Both scales are parent report questionnaires assessing child anxiety symptoms in specific anxiety domains, for example social anxiety and separation anxiety. The PAS is a 28 item questionnaire validated for use with 4.5–6.5 year olds. Items are answered on a five point Likert scale (0 = Not true at all; 4 = Very often true). Two scores were computed: total anxiety score being a sum of responses from all 28 items (min = 0, max = 112) and the social anxiety subscale (6 items; min = 0, max = 24). Higher scores indicate more anxiety. The PAS has strong psychometrics; scores align with DSM-IV diagnoses, and the internalising scale of the Child Behaviour Check List (CBCL; Achenbach, 1991; Spence et al., 2001). The PAS has also shown good internal consistency both in terms of the full scale ($\alpha = 0.86$) and social phobia subscale ($\alpha = .81$) (Broeren & Muris, 2008). In the present sample $\alpha = 0.88$ for total score and $\alpha = 0.82$ for the social anxiety subscale.

The SCAS-P is a parallel measure which includes 38 items answered on a four point Likert scale (0 = Never; 3 = Always) validated for use with six to 18 year olds. The SCAS-P can be split into six subscales assessing specific anxiety domains, i.e. social anxiety. Two scores were taken from this questionnaire: the total anxiety score (the sum of all 39 items (min = 0, max = 114)) and the social anxiety subscale (the sum score of 6 items (min = 0, max = 18)). Higher scores indicate greater anxiety. The SCAS-P has good psychometric properties. It has good internal consistency of the total score ($\alpha = 0.82$) and social phobia subscales in a community sample ($\alpha = 0.70$) (Spence, 1998). In the present sample $\alpha = 0.87$ for total score and $\alpha = 0.77$ for the social anxiety subscale. The total score is able to differentiate between anxiety-disordered children and normal controls and the social anxiety subscale can differentiate between children with primary social anxiety and those with another primary anxiety diagnosis. The SCAS has also shown convergent validity with the CBCL (Achenbach, 1991).

2.2.2. Social worries anxiety index for young children (SWAIY)

The SWAIY was developed based on the Social Worries Questionnaire (SWQ-P; Spence, 1995). The SWQ-P is a 10-item parent report questionnaire assessing symptoms of social anxiety, validated for 8–17 year olds. Parents are asked how much his or her child avoids or worries about particular social situations. For example "He or she avoids or gets worried about going to parties". The original questionnaire has shown good internal consistency within the validated age group (Guttmann split half reliability = 0.93, α = 0.94; Spence, 1995). Factor analysis indicated a single factor accounting for 66% of variance. Children with social anxiety disorder score significantly higher on the SWQ-P than control children (Spence et al., 1999) and the scale can usefully discriminate between children with and without social anxiety disorder at least as well as the other major scales of child social anxiety (Bailey, Chavira, Stein & Stein, 2006). Thus the psychometrics available show the questionnaire to be a reliable and valid measure of social anxiety in children ages 8–17 years old.

For the present research, the SWQ-P was adapted to form the SWAIY. Seven questions of the 10 original SWQ-P items were edited to make them more applicable to children aged four to eight i.e. "Avoids or gets worried about presenting work to the class" was edited to "Avoids or gets worried about putting their hand up or speaking in front of the class (show and tell)". Alterations to situations were made by first devising potential alternatives and then presenting these alternatives at a research meeting attended by clinical psychologists and researchers from the Child and Adolescent Mental Health Service (CAMHS) Anxiety and Depression in Young people research (ANDY) unit at University of Reading. The final items were selected based on the discussion and feedback that took place within this research meeting and were approved by Professor Sue Spence, author of the SWQ-P. In keeping with the SWQ-P, parents answered the 10 items on a three-point scale (0 = not true; 2 = mostly true). A total score is computed by summing all responses (min = 0, max = 20). Higher scores indicate more social worries. To investigate whether the adaptations successfully presented scenarios that a four to eight year old would encounter an additional question was added asking parents to indicate whether any of the items were not applicable to their child. See Table 3 for the full item list.

2.3. Procedure

Data for this study was collected online as part of the screening process for an experimental study investigating the relationship between cognitive biases and anxiety in a community sample of children ages four to eight years old. Families were recruited through advertisements in magazines and newsletters targeting families and distribution of leaflets and posters to libraries, museums, brownie and scout groups, holidays groups, sports clubs, leisure centres and schools throughout Berkshire. To answer the advert, parents followed a link to a website where they could read the study information sheet. Once they had given informed consent they completed the questionnaires online. Parents answered the SWAIY and, depending on age, the PAS (for parents of children aged four to six years) or the SCAS-P (for parents of children aged seven or eight years). Demographic and contact details were also collected at this stage. Parents had the option to enter a prize draw to win an i-pod when visiting the online questionnaire. Parents were also asked if they were willing to be contacted again. Those who consented (94%) were contacted via email and invited to complete the SWAIY online again up to two weeks later. No other questionnaires were completed at time 2.

2.4. Attrition and missing data

Time 1 data was collected over 11 months between 2014 and 2015.

All parents who completed the measure at Time 1 were invited to complete the questionnaire a second time. As stated, 106 participants completed the questionnaire for a second time. On average the two time points were 13.35 days apart (SD = 0.01), ranging from 5 to 31 days. There was a 37% drop out from Time 1 to Time 2; there were no differences between those who completed the questionnaire once or twice in parent gender ($X^2(1) = 0.937$, $p = 0.713$, $\varphi = 0.01$), child gender ($X^2(1) = 0.988$, $p = 0.558$, $\varphi = 0.01$) or child age ($t(167) = -0.151$, $p = 0.880$, $d = 0.02$). However, parents who answered the SWAIY at Time 1 and Time 2 ($n = 106$, $M = 6.12$, $SD = 4.78$) reported that their child was more anxious than parents who only answered the SWAIY at Time 1($n = 60$, $M = 4.60$, $SD = 4.42$), the difference was significant with a small effect (Mann-Whitney U independent t-test, $p = 0.035$, $d = 0.33$).

All participants included in the study (169 at time 1 and 106 at time 2) had full data on the SWAIY but data on additional questionnaires (e.g PAS/SCAS-P) was missing for twelve of the 169 participants at time 1. The convergent validity analyses requiring these measures were therefore conducted with a reduced sample of 157 (47.8% female, $M_{age} = 6.27$, $SD = 1.28$).

2.5. Data analysis

Distributions for each of the questionnaires were examined for normality via visual inspections of histograms and boxplots as well as assessment of skewness and kurtosis. If non-normal distributions were identified non-parametric assessments were carried out with these variables. All comments regarding effect sizes are based on Cohen (1988). Data from Time 1 and Time 2 were checked for age and gender differences. Items scored as "not applicable" at each time point were assessed to gather evidence for content validity and to establish whether items should be excluded. Internal consistency and test-retest reliability were investigated via correlation analysis using data from Time 1 and Time 2. To complement the internal consistency measures, data from Time 1 (n = 169) was used to examine the factor structure of the SWAIY using exploratory factor analysis (EFA), with confirmatory factor analysis (CFA) carried out on data from Time 2 (n = 106). Given the relatively small sample size available for the CFA, the results should be interpreted with some caution, as model fit indices may be liable to type two error when sample size is small (Jackson, 2001). EFA and CFA analyses and internal consistency analyses were carried out on item responses of the SWAIY using maximum likelihood estimation. Given that item responses were categorical, polychoric correlations were used to assess internal consistency as well as for factor analysis (Holgado-Tello, Chacón-Moscoso, Barbero-García, & Vila-Abad, 2009) using R (R Core Team, 2015) packages nfactors (Raiche, 2010), polycor (Fox, 2010), psych (Revelle, 2015), gdata (Warnes et al., 2015), and lavaan (Rosseel, 2012). Polychoric correlations estimate the correlation between items had they been continuous and normally distributed (Holgado-Tello et al., 2009). These correlations can then be utilised within factor analysis with no further need to account for the categorical nature of the items.

Data from Time 1 were used to assess convergent validity with anxiety scores on the PAS or SCAS-P. As different measures were completed depending upon the age of the child, t-scores were calculated for total anxiety and social anxiety based on the published norm data (Nauta et al., 2004; Spence et al., 2001). Convergent validity was then examined by correlating these T-scores with the SWAIY total scores.

3. Results

The total score on the SWAIY at Time 1 was positively skewed (*skewness* = 0.84, *kurtosis* = 0.13, *z score skewness* = 4.56) and non-

parametric tests were therefore used for analyses including this variable. The other anxiety measures and SWAIY total score at Time 2 were normally distributed, though there was a slight positive skew for total anxiety (*skewness* = 0.649, *kurtosis* = −0.327) and the social anxiety subscale (*skewness* = 0.601, *kurtosis* = 0.371) of the SCAS.

Table 1 shows the descriptive statistics of the SWAIY at Time 1 and Time 2. At Time 1 there was no difference between boys and girls total scores on the SWAIY (p = 0.121, d = 0.45) at Time 1. At Time 2 there was a significant difference between female and male children (t(104) = 2.24, p = 0.027, d = 0.44) with females scoring higher than males. There were no significant correlations between age and total SWAIY score at Time 1 (r = −0.102, p = 0.187) or Time 2 (r = −0.07, p = 0.486).[1]

3.1. Content validity

Frequencies of items identified by parents as not applicable to their child can be seen in Table 2. Given the low numbers of items identified and their respective frequencies, no formal analysis on this data was carried out. As Table 2 illustrates there was no consensus or consistency in the items identified as not applicable. Therefore, all items were deemed appropriate for the age group and none were removed. Items identified in Table 2 were considered when conducting the factor analysis in case this informed interpretation of factor loadings.

3.2. Internal consistency and factor analysis

Internal consistency of the SWAIY was excellent at both time points (Time 1 α = 0.92, Time 2 α = 0.92).

3.2.1. Exploratory factor analysis

Exploratory factor analysis was conducted using Time 1 data. Several tests were carried out to check that the data was appropriate for factor analysis and to ascertain how many factors should be explored. Firstly the Kaiser-Meyer-Olkin measure of sample adequacy (MSA) and Bartlet's test was carried out to check factor analysis was appropriate. MSA assesses whether the sample for each variable and for the complete model is adequate for assessment by factor analysis by producing a figure between 1 and 0, values close to 1 indicate a good fit for factor analysis. Bartlett's test assesses the correlation matrix to determine whether the items cluster into factors or represent individual factors. For factor analysis to be appropriate Bartlett's test should be significant (Field, 2013). In the present case, factor analysis was deemed to be appropriate as the MSA was close to 1 and Bartlett's test was significant (MSA = 0.87, Bartlett's test X^2(45) = 1123.669, p < 0.001). The number of factors that should be explored was then determined. The number of factors after which eignevalues levelled off was assessed via a scree plot. To complement this test Minimum Average Partial criterion (MAP) was used to assess how many common components were found in the data (Ledesma & Valero-mora, 2007). Finally a very simple structure analysis (VSS) was run to assess which number of factors maximises the goodness of fit (Revelle & Rocklin, 1979). The scree plot and MAP criterion were suggestive of a one-factor solution and the VSS analysis also indicated one factor would be optimal (BIC = 148, $RMSEA$ = 0.18). However a two-factor model had lower RMSEA values and BIC values, indicating a better model fit (BIC = 85, $RMSEA$ = 0.16) than the one factor model. Given these results both a one factor and two-factor model were explored using a promax rotation.

A one-factor solution accounted for 53% of the variance and factor loadings for all items were sufficient with loadings ranging from 0.63 to 0.81 (See Table 3). While the two factor solution accounted for 60% of

Table 1
Descriptive Statistics of the total scores on SWAIY at Time 1 and Time 2.

SWAIY	N	Mean	SD	Range
Total T1	169	5.44	4.66	0–20
4 yr. olds	35	5.63	5.10	0–18
5 yr. olds	35	5.91	5.15	0–20
6 yr. olds	42	6.43	4.73	0–17
7yr. olds	35	5.49	4.16	0–18
8 yr. olds	22	3.22	3.12	0–10
Total T2	106	6.58	4.60	0–17
4 yr. olds	22	5.95	4.58	0–16
5 yr. olds	22	7.32	3.98	0–16
6 yr. olds	28	7.25	5.03	0–17
7 yr. olds	22	6.95	4.99	0–17
8 yr. olds	12	4.17	3.56	0–10

Note: T1 = Time 1, T2 = Time 2.

Table 2
Frequencies of items identified as 'Not Applicable' at Time 1 and Time 2.

Item	T1	T2
4. Avoids or gets worried about presenting work to the class/about putting their hand up or speaking in front of the class (show & tell)	4	1
5. Avoids or gets worried about attending groups, clubs or after school activities	–	1
7. Avoids or gets worried about talking in front of a group of adults	2	1
8. Avoids or gets worried about going into a shop alone or to buy something or telling staff in a café what they would like to eat/drink	3	4

Note: T1 = Time 1 (N = 169), T2 = Time 2 (N = 106).

the variance, analysis indicated that a Heywood case had occurred. This occurs when one item has a negative variance and a factor loading greater than one. The Heywood case related to item 8 "Avoids or gets worried about going into a shop alone or to buy something or telling staff in a café what they would like to eat/drink" within the first factor and item 1 "Avoids or gets worried about going to parties or play-dates" within the second factor of the two factor solution. This can indicate a number of things including that one item accounts for all the variance within a factor or that there too many factors being fitted to the data. Also, when considering the items contained within each of the two factors there appeared to be no theoretical/conceptual distinction between the two factors. Given this, a varimax rotation which assumes the factors correlated, was also checked however, this did not substantially alter the results. Therefore a one-factor model was investigated within the confirmatory factor analysis using Time 2 data.

3.2.2. Confirmatory factor analysis

To confirm the one-factor structure at Time 1, a confirmatory factor analysis using a structural equation modelling approach was conducted in R using Time 2 SWAIY data. For adequate model fit it has been suggested that CFI and TLI statistics should be close to 0.90 and that RMSEA values close to 0.06 demonstrate a good fit (Hu & Bentler, 1999), although model fit statistics should be taken together when assessing goodness of fit (Jackson, 2001). Confirmatory factor analysis indicated that model fit for a one-factor solution had a CFI and TLI approaching 0.90, but a RMSEA higher than 0.06 (CFI = 0.87, TLI = 0.83, $RMSEA$ = 0.12). Taken together therefore, we judged that the one-factor solution showed reasonable model fit. Analyses indicated that all the items significantly contributed to one latent variable, loadings ranged from 0.53 to 0.76 (See Table 3). These results confirm

Table 3
Factor loading coefficients of items from exploratory and confirmatory factor analysis on 10 items of the SWAIY.

Item	EFA			CFA
	1 Factor Model	2 Factor Model 1	2	1 Factor Model
1. Avoids or gets worried about going to parties or play-dates	0.63		1.05	0.54
2. Avoids or gets worries about using or speaking on the telephone	0.67	0.41		0.60
3. Avoids or gets worried about meeting new people	0.81		0.45	0.81
4. Avoids or gets worried about presenting work to the class/about putting their hand up or speaking in front of the class (show & tell)	0.70	0.76		0.53
5. Avoids or gets worried about attending groups, clubs or after school activities	0.78		0.78	0.57
6. Avoids or gets worried about approaching groups of kids to ask to join in/play	0.78	0.57		0.71
7. Avoids or gets worried about talking in front of a group of adults	0.80	0.89		0.76
8. Avoids or gets worried about going into a shop alone or to buy something or telling staff in a café what they would like to eat/drink	0.75	1.03		0.76
9. Avoids or gets worried about standing up for him/herself with other kids i.e. when someone takes their toy	0.63	0.50		0.59
10. Avoids or gets worried about entering a room full of people	0.72		0.40	0.66

Note: (EFA) Exploratory factor analysis, (CFA) Confirmatory Factor Analysis. Exploratory factor analysis was carried out with Time 1 data (*N* = 169), factor loadings represent pattern loadings. Confirmatory factor analysis was carried out with Time 2 data (*N* = 106), factor loadings represent standardised factor loadings.

the structure found at Time 1.

3.3. Test re-test reliability

Non-parametric correlations were conducted between SWAIY total scores at Time 1 and Time 2 for 106 children. The average length of time between Time 1 and Time 2 was 13.35 days (*SD* = 0.01). A large positive correlation (*Spearman Rho* = 0.87) was found between scores on the SWAIY at Time 1 and Time 2.

3.4. Convergent validity

Given non-normality of the SWAIY at Time 1 non-parametric correlations were used to assess convergent validity. Mean T-scores for total anxiety and for the social anxiety subscales suggest that, as a whole, the sample had an average level of anxiety (*Mtotal* = 55.07, *SD* = 12.71; *MSocial* = 54.72, *SD* = 13.36). Total anxiety and social anxiety both showed robust correlations with SWAIY at Time 1 (*r* = 0.63; *r* = 0.70) and Time 2 (r = 0.64; r = 0.87) respectively, with large effect sizes.

4. Discussion

The aim of this research was to develop a brief parent report measure of social anxiety in young children and to conduct an initial psychometric evaluation of this questionnaire. The psychometric evaluation provides initial evidence that the SWAIY is a reliable and valid measure of social anxiety in children aged between four and eight years old. Very few parents identified any of the items as not applicable to their child, indicating that the ten items were appropriate and relevant to this age group and providing initial evidence of content validity. The internal reliability of the questionnaire was demonstrated through excellent internal consistency at Time 1 and Time 2. The internal structure of the questionnaire was scrutinised using factor analysis and a one-factor solution explaining 53% of the variance was suggested by the exploratory factor analysis using the data collected at Time 1. This one factor solution was confirmed using the data collected at Time 2 with adequate model fit. These results are consistent with the one-factor structure which explained 66% of the variance in the original SWQ-P (Spence, 1995). Findings therefore indicate that the items of the SWAIY

are collectively measuring the same construct, namely social worries and symptoms of social anxiety. The SWAIY showed excellent test-retest reliability when completed by parents two weeks apart. Convergent validity was also assessed and the SWAIY was correlated with the other standardised questionnaires of anxiety in children and their respective social anxiety subscales. As would be anticipated, correlations with the social anxiety subscales were slightly stronger than correlations with the total anxiety scales.

To our knowledge, the SWAIY is the first measure to focus on child social anxiety that has been developed for use with parents of young children. Such a measure will facilitate investigation of the development and stability of social anxiety in younger children, as well as the relationship between social anxiety symptoms and later social and mental health outcomes. Given the strong correlation between the SWAIY and existing measures of child anxiety, one could question the utility of the SWAIY over these measures. The strong correlations confirm the construct validity of the SWAIY reflecting both the SWAIY and the subscales of the standardised measures as assessing the underlying construct of social worries or symptoms of social anxiety. What is crucial is that the SWAIY is a brief, stand-alone measure, requiring parents to complete only 10 items. As a comparison, the PAS is 22 items and its social anxiety subscale was not designed to be a stand-alone measure. Also the SWAIY focuses on observable behaviours in specific social situations whereas the social anxiety subscales of the SCAS-P and the PAS include cognitive symptoms, which might be difficult for parents assess. Given this distinct focus, the SWAIY could be used to complement a standardised measure of anxiety or by itself as a brief measure of social anxiety in young children.

Gender differences in the SWAIY were not found at Time 1 replicating the findings of Spence (1995) with 8–17 year olds using the SWQ-P. There was also little difference between the means of the SWAIY for males and females at Time 2, although this difference was statistically significant with female children reported as having higher social worries scores than male children. These gender differences are consistent with studies of older children (i.e. Spence, 1998) and adolescents (Davidson, Hughes, George, & Blazer, 1993; Garcia-Lopez, Ingles, & Garcia-Fernandez, 2008), though they are not typically found in young children (Spence et al., 2001). Further analyses indicated that reliability and validity were not moderated by gender and that the factor structure of the SWAIY was the same across genders. Having said

this, alongside the difference between genders found at time 2, previous work indicates that factor structure of other anxiety measures, such as the SCAS (Holly, Little, Pina, & Caterino, 2014), may be influenced by gender. Therefore, checking measurement invariance by gender for the SWAIY using a larger sample may be warranted in future research.

Overall, there is strong support for the psychometric properties of the SWAIY as a new brief measure of social anxiety in young children but this conclusion should be considered in light of some considerations. First, the scores for eight year old children were notably lower than the scores for younger children. Given the items were specifically adapted to be appropriate for a younger age group than the original measure (validated for 8–17 year olds) it may be that the SWAIY is a more valid and accurate measure of social worries in children aged 4–7 years than children aged 8 years. Unfortunately, there were not enough eight year olds in this sample to assess factor structure for the eight year olds specifically. With this in mind, it may be prudent to use the original SWQ to assess social worries in 8-year olds until further psychometric evaluation of the SWAIY for older children has been conducted. The second consideration is that the sample was recruited from Berkshire, UK, where approximately 80% of the population are white and a range of ethnic groups are represented in the remaining 20% of the population (Office of National Statistics, 2012), thus analysis of race effects was not feasible with the present data. Given this, we should be cautious about generalising the findings to other populations without further research assessing the psychometric properties of the measure in other samples. It is also noteworthy that the sample was self-selecting; participants were recruited via adverts asking for children to take part in a study on child anxiety and confidence. The description of the study may have attracted parents who were interested in child anxiety possibly because they were concerned about their own child's anxiety. This may in part explain why those who answered twice reported higher anxiety scores for their children than those who answered once; parents with children with higher anxiety may have been motivated to continue with the study. Thirdly the small sample size available for the CFA may have influenced model fit indices, which approached the criteria for adequate fit. As model fit indices are affected by sample size (Jackson, 2001), future research may wish to reassess the one-factor structure using CFA with a larger sample. This would help to clarify whether the present findings are robust.

While this study provides initial evidence of the validity and reliability of the SWAIY, additional psychometric assessment with a clinical sample would be useful to assess divergent and discriminative validity further. In particular it would be useful to assess the divergent validity of the SWAIY in relation to clinically diagnosed anxiety disorders to see if it is able to discriminate between social anxiety and other child anxiety disorders. This would be interesting and important given the co-morbidity found in childhood anxiety (Waite & Creswell, 2014) and the reliance on parent report of anxiety in the present study. Similarly, evaluating the SWAIY in relation to other measures of anxiety such as teacher-report and observation measures will give further information regarding the utility and psychometric properties of the scale.

5. Conclusions

The results indicate that the SWAIY has robust reliability and validity, providing evidence of construct validity. Our findings replicate those from the validation of the original SWQ-P questionnaire and suggest that the questionnaire can be adapted to measure social worries or symptoms of social anxiety in children aged four to eight years old. Future research using a clinical sample to assess discriminative validity, for example by assessing whether scores on the SWAIY differentiate between a clinically socially anxious sample and a community/non-clinical sample, would provide a more complete investigation of the psychometric properties of the scale. The measure shows promise in providing information about the social worries that children experience in response to specific situations. Thus, the SWAIY may be useful for investigating the stability and development of social anxiety symptoms across early childhood and has the potential to be useful clinically as a screening tool for social anxiety.

Appendix A

Table A1.

Table A1
Items and response scale of the Social Worries Anxiety Index for Young Children.

	Not True	Sometimes True	Very True	Not Applicable
Avoids or gets worried about going to parties or play-dates	0	1	2	n/a
Avoids or gets worries about using or speaking on the telephone	0	1	2	n/a
Avoids or gets worried about meeting new people	0	1	2	n/a
Avoids or gets worried about presenting work to the class/about putting their hand up or speaking in front of the class (show & tell)	0	1	2	n/a
Avoids or gets worried about attending groups, clubs or after school activities	0	1	2	n/a
Avoids or gets worried about approaching groups of kids to ask to join in/play	0	1	2	n/a
Avoids or gets worried about talking in front of a group of adults	0	1	2	n/a
Avoids or gets worried about going into a shop alone or to buy something or telling staff in a café what they would like to eat/drink	0	1	2	n/a
Avoids or gets worried about standing up for him/herself with other kids i.e. when someone takes their toy	0	1	2	n/a
Avoids or gets worried about entering a room full of people	0	1	2	n/a