Journal of Anxiety Disorders 49 (2017) 40–47

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

journal homepage: www.elsevier.com/locate/janxdis

Subtyping social anxiety in youth

A. Kodal[a,b,d,*], I. Bjelland[a,b,d], R. Gjestad[b], G.J. Wergeland[a,c], O.E. Havik[e], E.R. Heiervang[f], K. Fjermestad[g]

[a] Department of Child and Adolescent Psychiatry, Division of Psychiatry, Haukeland University Hospital, Bergen, Norway
[b] Research Department, Division of Psychiatry, Haukeland University Hospital, Bergen, Norway
[c] Regional Center for Child and Youth Mental Health and Child Welfare, Uni Health, Uni Research, Bergen, Norway
[d] Department of Clinical Medicine, Faculty of Medicine and Dentistry, University of Bergen, Bergen, Norway
[e] Department of Clinical Psychology, Faculty of Psychology, University of Bergen, Bergen, Norway
[f] Institute of Clinical Medicine, University of Oslo, Oslo, Norway
[g] Department of Psychology, University of Oslo, Oslo, Norway

ARTICLE INFO

Keywords:
Subtypes
Social anxiety disorder
DSM-5
Youth
Classification
Avoidance

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.

* Corresponding author at: Division of Psychiatry, Haukeland University Hospital, p.b 1400, 5021, Bergen, Norway.
E-mail addresses: Arne.Kodal@helse-bergen.no, arnekodal@gmail.com (A. Kodal).

http://dx.doi.org/10.1016/j.janxdis.2017.03.009
Received 2 March 2016; Received in revised form 30 January 2017; Accepted 31 March 2017
Available online 02 April 2017

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

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.

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.

Acknowledgements

This research was supported by grants from the Western Norway Regional Health Authority, project number 911366, 911253 and 911840. We would like to express our deep gratitude to all the children and parents for participation in this study.

References

Aderka, I. M., Nickerson, A., & Hofmann, S. G. (2012). Admixture analysis of the diagnostic subtypes of social anxiety disorder: implications for the DSM-V. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*, 752–757. http://dx.doi.org/10.1016/j.jbtep.2011.10.012.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders*(4th ed. rev. text). Washington, D.C: American Psychiatric Pub.

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*(5th ed.). Washington, DC: American Psychiatric Pub.

Aune, T., Stiles, T. C., & Svarva, K. (2008). Psychometric properties of the social phobia and anxiety inventory for children using a non-American population-based sample. *Journal of Anxiety Disorders*, *22*, 1075–1086. http://dx.doi.org/10.1016/j.janxdis.

2007.11.006.
Bögels, S. M., Alden, L., Beidel, D. C., Clark, L. A., Pine, D. S., Stein, M. B., et al. (2010). Social anxiety disorder: Questions and answers for the DSM-V. *Depression and Anxiety*, *27*, 168–189. http://dx.doi.org/10.1002/da.20670.
Beidel, D. C., & Alfano, C. A. (2005). *Childhood anxiety disorders*. New York: Routledge Taylor & Francis Group.
Burstein, M., He, J. P., Kattan, G., Albano, A. M., Avenevoli, S., & Merikangas, K. R. (2011). Social phobia and subtypes in the national comorbidity survey-adolescent supplement: Prevalence, correlates, and comorbidity. *Journal of the American Academy of Child and Adolescent Psychiatry*, *50*, 870–880. http://dx.doi.org/10.1016/j.jaac.2011.06.005.
Cederlund, R., & Öst, L.-G. (2013). Psychometric properties of the social phobia and anxiety inventory-child version in a Swedish clinical sample. *Journal of Anxiety Disorders*, *27*, 503–511. http://dx.doi.org/10.1016/j.janxdis.2013.06.004.
Clark, D. M., & Wells, A. (1995). *A cognitive model of social phobia*. The Guilford Press: New York.
Cox, B. J., Clara, I. P., Sareen, J., & Stein, M. B. (2008). The structure of feared social situations among individuals with a lifetime diagnosis of social anxiety disorder in two independent nationally representative mental health surveys. *Behaviour Research and Therapy*, *46*, 477–486. http://dx.doi.org/10.1016/j.brat.2008.01.011.
Crawley, S. A., Beidas, R. S., Benjamin, C. L., Martin, E., & Kendall, P. C. (2008). Treating socially phobic youth with CBT: Differential outcomes and treatment considerations. *Behavioural and Cognitive Psychotherapy*, *36*, 379–389. http://dx.doi.org/10.1017/S1352465808004542.
Crome, E., Baillie, A., Slade, T., & Ruscio, A. M. (2010). Social phobia: Further evidence of dimensional structure. *Australian and New Zealand Journal of Psychiatry*, *44*, 1012–1020.
Currie, C., Molcho, M., Boyce, W., Holstein, B., Torsheim, T., & Richter, M. (2008). Researching health inequalities in adolescents: The development of the health behaviour in school-aged children (HBSC) family affluence scale. *Social Science & Medicine*, *66*, 1429–1436. http://dx.doi.org/10.1016/j.socscimed.2007.11.024.
Dalrymple, K., & D'Avanzato, C. (2013). Differentiating the subtypes of social anxiety disorder. *Expert Review of Neurotherapeutics*, *13*, 1271–1283. http://dx.doi.org/10.1586/14737175.2013.853446.
Essau, C. A., Conradt, J., & Pettermann, F. (1999). Frequency and comorbidity of social phobia and social fears in adolescents. *Behavior Research and Therapy*, *37*, 831–843. http://dx.doi.org/10.1016/s0005-7967(98)00179-x.
Heimberg, R. G., Horner, K. J., Juster, H. R., Safren, S. A., Brown, E. J., Schneier, F. R., et al. (1999). Psychometric properties of the Liebowitz Social Anxiety Scale. *Psychological Medicine*, *29*, 199–212. http://dx.doi.org/10.1017/s0033291798007879.
Hofmann, S. G., Heinrichs, N., & Moscovitch, D. A. (2004). The nature and expression of social phobia: Toward a new classification. *Clinical Psychology Review*, *24*, 769–797. http://dx.doi.org/10.1016/j.cpr.2004.07.004.
Holt, C. S., Heimberg, R. G., Hope, D. A., & Liebowitz, M. R. (1992). Situational domains of social phobia. *Journal of Anxiety Disorders*, *6*, 63–77. http://dx.doi.org/10.1016/0887-6185(92)90027-5.
Hook, J. N., Valentiner, D. P., & Connelly, J. (2013). Performance and interaction anxiety: Specific relationships with other- and self-evaluation concerns. *Anxiety Stress and Coping*, *26*(2), 203–216. http://dx.doi.org/10.1080/10615806.2012.654777.
Hudson, J. L., Rapee, R. M., Lyneham, H. J., McLellan, L. F., Wuthrich, V. M., & Schniering, C. A. (2015). Comparing outcomes for children with different anxiety disorders following cognitive behavioural therapy. *Behaviour Research and Therapy*, *72*, 30–37. http://dx.doi.org/10.1016/j.brat.2015.06.007.
Kerns, C. E., Comer, J. S., Pincus, D. B., & Hofmann, S. G. (2013). Evaluation of the proposed social anxiety disorder specifier change for DSM-5 in a treatment-seeking sample of anxious youth. *Depression and Anxiety*, *30*, 709–715. http://dx.doi.org/10.1002/da.22067.
Knappe, S., Beesdo-Baum, K., Fehm, L., Stein, M. B., Lieb, R., & Wittchen, H. U. (2011). Social fear and social phobia types among community youth: differential clinical features and vulnerability factors. *Journal of Psychiatric Research*, *45*, 111–120. http://dx.doi.org/10.1016/j.jpsychires.2010.05.002.
Lyneham, H. J., Abbott, M. J., & Rapee, R. M. (2007). Interrater reliability of the anxiety disorders interview schedule for DSM-IV: Child and parent version. *Journal of the American Academy of Child & Adolescent Psychiatry*, *46*, 731–736. http://dx.doi.org/10.1097/chi.0b013e3180465a09.
Merikangas, K. R., He, J. P., Burstein, M., Swanson, S. A., Avenevoli, S., Cui, L., et al. (2010). Lifetime prevalence of mental disorders in U. S. adolescents: Results from the national comorbidity survey replication–adolescent supplement (NCS-A). *Journal of the American Academy of Child Adolescent Psychiatry*, *49*, 980–989. http://dx.doi.org/10.1016/j.jaac.2010.05.017.
Moscovitch, D. A., & Huyder, V. (2011). The negative self-portrayal scale: Development, validation, and application to social anxiety. *Behavior Therapy*, *42*, 183–196. http://dx.doi.org/10.1037/t03332-000.
Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive and Behavioral Practice*, *16*, 123–134. http://dx.doi.org/10.1016/j.cbpra.2008.04.002.
Muthén, L. K., & Muthén, B. O. (2015). *Mplus user's guide*(7th ed.). Los Angeles, CA: Muthén & Muthén.
Oakman, J., Van Ameringen, M., Mancini, C., & Farvolden, P. (2003). A confirmatory factor analysis of a self-report version of the Liebowitz Social Anxiety Scale. *Journal of Clinical Psychology*, *59*, 149–161. http://dx.doi.org/10.1002/jclp.10124.
Piqueras, J. A., Olivares, J., & López-Pina, J. A. (2008). A new proposal for the subtypes of social phobia in a sample of Spanish adolescents. *Journal of Anxiety Disorders*, *22*, 67–77. http://dx.doi.org/10.1016/j.janxdis.2007.01.007.
Rao, P. A., Beidel, D. C., Turner, S. M., Ammerman, R. T., Crosby, L. E., & Sallee, F. R. (2007). Social anxiety disorder in childhood and adolescence: Descriptive psychopathology. *Behaviour Research and Therapy*, *45*, 1181–1191. http://dx.doi.org/10.1016/j.brat.2006.07.015.
Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, *35*, 741–756. http://dx.doi.org/10.1016/S0005-7967(97)00022-3.
Rapee, R. M., & Spence, S. H. (2004). The etiology of social phobia: Empirical evidence and an initial model. *Clinical Psychology Review*, *24*, 737–767. http://dx.doi.org/10.1016/j.cpr.2004.06.004.
Silverman, W. K., & Albano, A. M. (1996). *Anxiety disorders interview schedule for DSM-IV: Parent interview schedule, vol. 1*. Oxford University Press.
Spence, S. H., & Rapee, R. (2016). The etiology of social anxiety disorder: An evidence-based model. *Behavior Research and Therapy*. http://dx.doi.org/10.1016/j.brat.2016.06.007.
Sumter, S., Bokhorst, C., & Westenberg, P. M. (2009). Social fears during adolescence: Is there an increase in distress and avoidance? *Journal of Anxiety Disorders*, *23*, 897–903. http://dx.doi.org/10.1016/j.janxdis.2009.05.004.
Vriends, N., Becker, E. S., Meyer, A., Michael, T., & Margraf, J. (2007). Subtypes of social phobia: Are they of any use? *Journal of Anxiety Disorders*, *21*, 59–75. http://dx.doi.org/10.1016/j.janxdis.2006.05.002.
Wang, J., & Wang, X. (2012). *Structural equation modeling: Applications using mplus*. John Wiley & Sonshttp://dx.doi.org/10.1002/9781118356258.
Weems, C. F., & Costa, N. M. (2005). Developmental differences in the expression of childhood anxiety symptoms and fears. *Journal of the American Academy of Child & Adolescent Psychiatry*, 44. http://dx.doi.org/10.1097/01.chi.0000162583.25829.4b.
Wergeland, G. J. H., Fjermestad, K. W., Marin, C. E., Haugland, B. S.-M., Bjaastad, J. F., Oeding, K., et al. (2014). An effectiveness study of individual vs. group cognitive behavioral therapy for anxiety disorders in youth. *Behaviour Research and Therapy*, *57*, 1–12. http://dx.doi.org/10.1016/j.brat.2014.03.007.
Wergeland, G. J. H., Fjermestad, K. W., Marin, C. E., Bjelland, I., Haugland, B. S.-M., Silverman, W. K., et al. (2016). Predictors of treatment outcome in an effectiveness trial of cognitive behavioral therapy for children with anxiety disorders. *Behaviour Research and Therapy*, *76*, 1–12. http://dx.doi.org/10.1016/j.brat.2015.11.001.
Westenberg, M. P., Drewes, M. J., Goedhart, A. W., Siebelink, B. M., & Treffers, P. D. A. (2004). A developmental analysis of self-reported fears in late childhood through mid-adolescence: Social-evaluative fears on the rise? *Journal of Child Psychology and Psychiatry*, *45*. http://dx.doi.org/10.1111/j.1469-7610.2004.00239.x.
Wittchen, H. U., & Fehm, L. (2003). Epidemiology and natural course of social fears and social phobia. *Acta Psychiatrica Scandinavica*, *108*, 4–18. http://dx.doi.org/10.1034/j.1600-0447.108.s417.1.x.
Wothke, W. (2000). Longitudinal and multigroup modeling with missing data. In T. D. Little, K. U. Schnabel, & J. Baumert (Eds.), *Modeling longitudinal and multilevel data* (pp. 269–281). Mahwah, NJ: Lawrence Erlbaum. http://dx.doi.org/10.4324/9781410601940.
Yang, C.-C. (2006). Evaluating latent class analysis models in qualitative phenotype identification. *Computational Statistics & Data Analysis*, *50*, 1090–1104. http://dx.doi.org/10.1016/j.csda.2004.11.004.