

The Role of Peers in the Development of Social Anxiety in Adolescent Girls:
A Systematic Review

Leanne Pickering^{a, 1}, Julie A. Hadwin^a & Hanna Kovshoff^{a*}

^a Centre for Innovation in Mental Health – Developmental Lab

Department of Psychology

University of Southampton

Highfield

Southampton S017 1BJ

U.K.

*Corresponding author: H.Kovshoff@soton.ac.uk

tel: +44(0) 2380 594593

¹ Present Address: Children, Adults, Families, Health and Education, West Sussex County Council, Centenary House, Durrington Lane, Worthing, West Sussex, BN13

Abstract

Pathways to social anxiety often reflect a set of complex and interacting factors that include both intrinsic and environmental factors. Theoretical models of social anxiety have highlighted that children and adolescents' peer experiences can increase risk for social anxiety. This systematic review explored the role of peers in the development of social anxiety in adolescent girls. It aimed to identify peer-related risk factors (i.e., peer acceptance, peer attachment, friendship quality, peer support, and victimization) that place adolescents at risk for social anxiety, and to highlight those that are specific to girls. The findings showed that while low peer acceptance was significantly associated with increased social anxiety for boys and girls, limited close friendships, negative friendship experiences and relational victimization were highlighted as risk factors specific to girls. The review suggested that researchers might usefully start to develop frameworks that capture generic, as well as gender-specific risk for social anxiety in adolescence. These will enable the development of prevention and intervention methods to support girls at increased risk and that focus on improving the quality of peer relationships.

Keywords: social anxiety; gender; girls; peers; mental health; risk.

Introduction

Anxiety is a feeling of worry or fear that occurs in response to the anticipation of future threat (American Psychiatric Association; APA, 2013). Anxiety disorders are reported to be the most prevalent mental health need in the general population (Kessler et al., 2009), with worldwide prevalence rates estimated to be approximately 6.5% in children and adolescents (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). In a survey of mental health of UK children and adolescents, Green, McGinnity, Meltzer, Ford, and Goodman (2005) found that approximately 4% of adolescent boys and 5% of girls had a clinically recognised anxiety disorder. Researchers have found that individuals who experience a higher number of anxiety disorders during adolescence are at increased risk of later anxiety disorders and educational underachievement (Woodward & Fergusson, 2001). Further studies have found that adolescent anxiety better predicts psychosocial outcomes in adulthood than childhood anxiety. For example, anxiety in adolescence was found to be strongly associated with adverse outcomes at age 30, with adolescent anxiety significantly predicting poorer adjustment in adulthood, lower life satisfaction, poor coping skills and high chronic stress (Essau, Lewinsohn, Olaya, & Seeley, 2014). Moreover, gender differences exist such that adolescent girls are at increased risk of developing anxiety disorders than boys (Essau et al., 2014). However, there is a paucity of research that specifically aims to understand gender-specific risk factors in the development of clinical levels of anxiety.

Risk Factors for Social Anxiety

Although it is not uncommon for many people to experience social anxiety, particularly those with shy or inhibited temperaments, these feelings are often temporary or have minimal impact on daily life. When symptoms persist for an extended period of time and impair every day functioning, this profile can lead to a diagnosis of Social Anxiety Disorder (SAD; APA, 2013). Symptoms of SAD include worries or fear associated with social situations where there is a chance of “scrutiny” or being “negatively evaluated” by

others, and where situations are “avoided or endured with intense fear or anxiety” (APA, p.202). The diagnostic criteria highlight that children must experience social anxiety during interactions with peers, as well as adults, with this difficulty typically lasting for at least six months. It also states that the persistent and intense fear of social situations is disproportionate to the level of threat posed by the actual situation (APA, 2013; National Institute for Health and Care Excellence, 2013) and causes significant personal distress especially in social situations (e.g., meeting new people, speaking in public, eating in public, school attendance, working in groups and speaking in meetings).

While researchers have reported that SAD has an estimated 12-month prevalence rate of approximately 7% in community populations of adults (Fehm, Pelissolo, Furmark, & Wittchen, 2005; Kessler, Chiu, Demler, & Walters, 2005), lifetime prevalence rates may be as high as 10.7% (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). The onset of social anxiety typically emerges during early to mid-adolescence, at a median age of approximately 13 years (APA, 2013; Merikangas et al., 2010). Research has indicated that 75% of individuals experience first onset by the age of 15 years (Kessler, Berglund, et al., 2005), with rates of SAD increasing sharply after the age of nine and that peak in adolescents between 10 and 19 years (Beesdo et al., 2007). Research has also found cross-cultural differences in prevalence rates; approximately 4% of Turkish adolescents were found to experience SAD (Demir, Karacetin, Eralp Demir, & Uysal, 2013) compared with 3% of Finnish adolescents (Ranta, Kaltiala-Heino, Rantanen, & Marttunen, 2009). Furthermore, gender differences indicate that women consistently show higher rates of social anxiety than men, both in the past twelve months (6.5% versus 4.8%; McLean, Asnaani, Litz, & Hofmann, 2011) and across the lifetime (12.3% versus 8.9%; Kessler et al., 2012).

Several studies have found that individuals diagnosed with SAD or who experience elevated symptoms of social anxiety are at risk of poorer outcomes relative to their non-socially anxious peers. For example, in a retrospective study of the impact of anxiety

disorders on educational outcomes, researchers found that nearly half (48.8%) of individuals with anxiety disorders reported having left school prematurely and that 61.2% of these individuals had a diagnosis of SAD (Van Ameringen, Mancini, & Farvolden, 2003). Leaving school prior to the completion of high school may have a long-term impact on an individual's well-being and life satisfaction (Stein & Kean, 2000). Even in the absence of depression, at least half of adults with social anxiety have been found to report a substantially reduced quality of life, including poorer general health, mental health and social functioning; this in turn negatively impacted on their work performance, employment and social relationships (Wittchen, Fuetsch, Sonntag, Muller, & Liebowitz, 2000).

Further research has shown that young people with SAD are at increased risk of developing secondary mental health difficulties. SAD has been found to be positively associated with subsequent depression (the risk being threefold for individuals with SAD relative to those with no anxiety disorders; Beesdo et al., 2007) and increased suicide attempts (Bolton et al., 2008; Davidson, Hughes, George, & Blazer, 1993; Khan, Leventhal, Khan, & Brown, 2002). The impact of SAD across development may therefore be partially accounted for through comorbidity with depressive disorders, where both are linked to poorer outcomes, including longer duration of illness and increased risk of attempted suicide (Stein et al., 2001). A further body of research has linked SAD to an increased risk of alcohol dependence and substance abuse (Buckner, Schmidt, et al., 2008; Buckner, Timpano, Zvolensky, Sachs-Ericsson, & Schmidt, 2008). Adolescents with SAD have been found to be twice as likely to have severe alcohol use disorder than their non-anxious peers, with socially anxious females more likely to develop alcohol problems in late adolescence and early adulthood compared with early to mid-adolescence in males (Black et al., 2015). However, it has also been suggested that, as well as being a risk factor for cannabis use, SAD may serve as a protective factor due to its association with reduced levels of peer involvement (Nelemans et al., 2016).

Several theoretical frameworks have been developed to understand the causal pathways leading to SAD, which highlight a complex set of factors linked to its onset (Tillfors, 2004). These include intrinsic or within-individual factors (e.g. genetics, temperament and cognitive biases) (Ollendick & Hirshfeld-Becker, 2002) and extrinsic or environmental factors (e.g. parenting and social relationships) (Brook & Schmidt, 2008). Based on a review of recent literature, Spence and Rapee (2016) proposed a framework of social anxiety, which described an interaction between intrinsic and environmental factors that increases the risk of developing SAD. They suggested that children who are intrinsically predisposed to social anxiety, either through genetics or temperament, are at risk of SAD if exposed to environmental risk factors. These factors then impact on the young person's social skills, problem solving behaviour and coping strategies. With social anxiety perceived as being on a continuum, risk factors may lead to heightened anxiety levels which meet the criteria for a diagnosis of SAD. While some risk factors are likely to be involved in the development of social anxiety, Spence and Rapee (2016) argued that a lack of prospective research means that there is insufficient evidence to establish causation and that some factors may only be involved in a maintenance cycle.

One longitudinal study captured the complexity of developmental pathways leading to SAD. It tracked the development of mental and physical health from preadolescence into adulthood (the TRacking Adolescents' Individual Lives Survey 'TRAILS' study; van Oort, Greaves-Lord, Ormel, Verhulst, & Huizink, 2011); participants aged 10 to 12 years were followed up biannually to identify potential risk factors for anxiety and depression. The results of growth modelling identified a number of generic risk factors for different anxiety types, with risk factors for SAD including temperament, self-esteem, peer factors, parenting and parental mental health. Furthermore, being a victim of bullying was a stable and long-term risk factor for social anxiety, alongside low sociometric status and being a bully.

Behavioural inhibition (BI) is a temperament characterised by heightened vigilance to threat and novelty, social reticence, and withdrawal from engaging with unfamiliar peers (Fox, 2010). Children who show BI have been found to be at greater risk of developing SAD in adolescence, with this relationship being stronger in girls (Schwartz, Snidman, & Kagan, 1999). In support a meta-analysis that included seven longitudinal studies showed a sevenfold increase in risk of developing SAD for BI children (Clauss & Blackford, 2012).

In support of genetic risk factors, Stein et al. (1998) found a tenfold risk for SAD in first-degree relatives of socially anxious individuals relative to non-anxious individuals. After recruiting 23 adults diagnosed with SAD, all first-degree relatives aged 16 and over took part in diagnostic interviews based on DSM-IV criteria. While 26.4% of relatives of the SAD group experienced general social anxiety, this compared with only 2.7% of relatives for the comparison group. Consistently, research has found that mothers' social anxiety significantly predicts anxiety in offspring (Bögels, Van Oosten, Muris & Smulders, 2001) and that there is an association between SAD in offspring and parental social anxiety, another anxiety disorder and depression (Lieb et al., 2000). A recent meta-analysis was conducted to explore genetic and environmental contributions to SAD in both children and adults. Using data from 12 twin studies, involving a total sample of 42,585 children and adults from Europe, the USA and Australia, an estimated heritability of 54% for SAD in children relative to 27% in adults was found, with most of the remaining variance being accounted for by non-shared environmental factors in both groups (Scaini, Belotti, & Ogliari, 2014).

Further studies have explored the role of environmental factors (e.g., parenting, illness and peer relationships) in the onset of SAD. For example, parental control, overprotection and parental mental health have been linked to its development (Brook & Schmidt, 2008). The impact of parenting on the emergence of anxious affect has been associated with several risks; parents who themselves experience anxiety are argued to model their own fears of social situations and are less likely to facilitate social experiences

for themselves or their children (Ollendick & Hirshfeld-Becker, 2002). In addition, parent rejection was found to be a significant predictor of child social anxiety (Festa & Ginsburg, 2011) and it has been shown that socially anxious children judge their parents as less emotionally warm and more rejecting than non-socially anxious children (Bögels et al., 2001). Furthermore, research has indicated that maternal overprotection is a significant predictor of children's social anxiety (Bögels et al., 2001; review by Möller, Nikolić, Majdanžić & Bögels, 2016) and that fathers of children with high social anxiety are more controlling than those with less anxious children (Greco & Morris, 2002).

Although the relationship between children and their parents is particularly important in childhood and preadolescence, peer relationships take on greater importance in adolescence as young people spend increasing amounts of time with their peer group (Furman & Buhrmester, 1992; Prinstein, Boergers, & Vernberg, 2001) and become particularly vulnerable to social embarrassment (Ollendick & Hirshfeld-Becker, 2002). In a review of cumulative risk factors for social anxiety and depression, Epkins and Heckler (2011) reported that peer-related risk factors were more strongly linked to child and adolescent social anxiety than family-related variables. They also highlighted possible gender differences across a number of different peer-related risk factors including peer acceptance and rejection, victimization, and loneliness, with mixed results. The finding that negative peer relations may serve as an important risk factor for the development of SAD later in life, could partly be accounted for through developmental cascade effects, where problems in one area could undermine functions in other domains and form part of a negative pathway to social anxiety (Masten, 2014; Masten & Cicchetti, 2010).

A large body of work has aimed to demonstrate that elevated social anxiety is associated with difficult peer relationships (Bracik, Krysta, & Zaczek, 2012). Studies have found that children with SAD experience lower quality friendships than their non-anxious peers (Baker & Hudson, 2015), are more likely to perceive themselves as less socially accepted (Ginsburg, La Greca, & Silverman, 1998) and to respond more poorly to negative

peer feedback (Kujawa, Arfer, Klein & Proudfit, 2014). Although socially anxious adolescents have also been found to have social relationships characterised by submissive behaviour (Walters & Inderbitzen, 1998), further evidence indicates that the quality of friendships can increase risk for, or provide protection from, the development of social anxiety. For example, Festa and Ginsburg (2011) found that children who experienced validation and acceptance in their friendships were less likely to experience symptoms of social anxiety. While research has also suggested that increased peer support is associated with decreased social anxiety (Cavanaugh & Buehler, 2016), evidence remains inconsistent, with Grills-Taquechel, Norton and Ollendick (2010) finding that poor adolescent peer support did not predict social anxiety.

The Current Study

The current evidence base suggests that adolescent girls are at increased risk of developing social anxiety disorder relative to boys (DeWit et al., 2005); however, understanding the risk profile for adolescent girls (vs. boys) has not been a direct focus of current research. Moreover, evidence indicates that there are consistent gender differences in child and adolescent peer experiences (Rose & Rudolph, 2006), but those aspects of peer relations that are critically important in the development of social anxiety in girls are unclear. To increase our understanding of peer-related risk and protective factors, this systematic review examined the role of peers in the development of social anxiety in adolescent girls. Specifically, it considered what role peer relationships have in identifying gender specific pathways for the development of social anxiety in girls. Its aims were threefold: (1) to collate and appraise the available evidence to guide further research study, (2) to inform interventions to promote the development of positive peer experiences; and (3) to highlight target areas of support for adolescent girls at risk of social anxiety.

Method

Search strategy

A systematic search of the literature was conducted using two electronic databases: PsycINFO via EBSCO and Web of Science (1970-2016). The search terms used in this literature review included "social anxiety" or "social anxiety disorder" or "social phobia" and peer or "peer relation*" or interpersonal or classmate or "social relation*" or friend* or "peer group*". The list of search terms was generated by the first author based on key terms identified in research papers during the initial searches. The thesaurus function was also used to explore related terms and constructs.

In PsycINFO, the results were filtered by limiters including publication (peer reviewed only), language (English), population (female) and age groups (school age 6-12 years; adolescence 13-17 years). In Web of Science, articles were filtered by publication type (article only) and language (English) and later refined by Topic (adolescen* or child*).

Inclusion and exclusion criteria

The search was completed in October 2016 and resulted in the identification of 839 articles to be screened by title and abstract. At this stage, studies were excluded if they met the exclusion criteria or did not relate to the research questions being addressed. A total of 63 articles were retrieved in full and assessed for eligibility against the inclusion and exclusion criteria. A total of 24 articles met the criteria for extraction and were included in this review; no qualitative research was found. Articles were only included if they involved pre-adolescent or adolescent girls aged between 10 and 17 years. Studies were excluded from the review if they did not involve participants within this age range. Research articles were only included if they measured social anxiety as an outcome variable and included data pertaining to the development of social anxiety. It was also necessary for research articles to include separate data for girls relating to the role of peers in the development of social anxiety. Reasons for exclusion of (N=39) papers are highlighted in supplementary analysis in Online Resource 4.

A summary of the systematic search strategy utilised in this review is shown in Figure 1. Information was extracted from the articles about authors, country, design, participants, measures of social anxiety, peer relationship measures, and relevant research findings. Following extraction and drafting of the report, the search was re-run in July 2017 to check whether any new papers were published in the interim since the initial and did not result in any additional articles.

Quality assessment

All studies were quantitative and involved either a cross-sectional (n=12) or longitudinal (n=12) design. The longitudinal studies were conducted over two or three time points and included timespans of three years (n=1), two years (n=3), one year (n=4), nine months (n=3) and two months (n=1). The studies were assessed for quality using a modified tool based on the Downs and Black (1998) checklist and the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Institute of Health, 2014). Consideration was given to a number of key areas including the reliability and validity of the measures used, potential confounding variables, participation rate and representativeness of the population, and the duration of the research. The 18 criteria for assessment are shown in Online Resource 1. Fourteen criteria apply to all studies and an additional 4 to those with a longitudinal design; therefore total quality is given as a proportional score.

The results of the quality assessment shown in Online Resource 2 for each study shows that the scores for cross-sectional studies (N=12) ranged from .52 - .79, while longitudinal studies (N=12) ranged from .67 - .89. This range of scores indicates that most studies were of an acceptable standard, with those use longitudinal designs being marginally higher. The majority of studies reported their aims or hypotheses (23/24), as well as the characteristics of participants (24/24), only a third provided detailed information on their inclusion and exclusion criteria. The majority (20/24) had a representative community-based sample of participants, with 14 studies reporting a

participation rate of >50%. All studies provided a good description of the measures used, with the majority (23) providing a detailed and clear description of their main findings.

Of the longitudinal studies, the majority had a sufficient timeframe to detect a change in social anxiety, with only one study having a particularly short time of two months (Siegel, la Greca, & Harrison, 2009). Loss to follow-up was widely considered by the studies in this review, with 7 (/12) experiencing a loss of >20%.

Results

Participants

A summary of the method and result for each of the 24 studies is shown in Table 1. This table shows that participants in the 24 studies ranged from age 8 to 19 years, with all studies including a number of participants aged between 12 and 15 years, the majority of studies (N=17) included participants within the 13 to 14-age range. The total number of participants involved in each study varied from 66 to 5,537. While 50% of the studies included between 205 and 561 participants, 25% had fewer than 200 and 25% over 1,500. Twenty-one studies included a mixed group of participants, with the remaining three included females only. The gender ratio in the mixed studies was approximately equal, with three including >60% girls.

The majority of studies were conducted in the USA (n=17), with one study each from Finland, the Netherlands, Sweden, Western Europe, Canada, China and Taiwan. The ethnicity of participants was consistently reported across studies from the USA. Of these, the majority had a predominantly Caucasian population (n=12), with 10 studies consisting of >70% Caucasian participants. Three studies included >67% Hispanic participants and two >50% African American.

Measures of social anxiety

The outcome measures of social anxiety were largely consistent across studies, with a total of 14 administering directly comparable measures including the Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998) and the Social Anxiety Scale for

Children-Revised (La Greca, 1999; La Greca & Stone, 1993). A further five studies administered the Multidimensional Anxiety Scale for Children (March, 1997), with the remainder using the Social Anxiety Scale for Children (La Greca, Dandes, Wick, Shaw, & Stone, 1988), the Social Phobia and Anxiety Inventory for Children (Beidel, Turner, & Morris, 1995, 1998), the Social Phobia Inventory (Connor et al., 2000) and the Social Phobia Screening Questionnaire for Children (Gren-Landell et al., 2009).

The Social Anxiety Scales for Children (Revised) and Adolescents consist of three subscales including: fear of negative evaluation from peers, general social avoidance and distress, and social avoidance and distress of new social situations and unfamiliar peers (La Greca & Lopez, 1998). Reliability for these measures was reported across studies, with internal consistency found to be adequate or above.

Measures of peer relationships

As different aspects of peer relationships were explored by the studies in this review, a range of measures was used to gather data on (1) peer acceptance, (2) peer support, (3) friendship quality and (4) peer victimization. While some measures were administered across multiple studies, others were less frequently used.

Three of the four studies which measured (1) peer acceptance in this review used the six-item self-report social acceptance subscale of the Self-Perception Profile for Children (Harter, 1985) or Adolescents (Harter, 1988), with internal consistency reported to be acceptable on both measures (Grills-Taquechel et al., 2010; Harter, 1988; Hutcherson & Epkins, 2009; La Greca & Lopez, 1998). One study used factor analysis to identify items from multiple measures that loaded onto a latent Peer Acceptance variable (La Greca & Lopez, 1998), while others developed their own measures based on the number of peer nominations young people received (Flanagan, Erath, & Bierman, 2008; Tillfors, Persson, Willen, & Burk, 2012). Although the latter is not directly comparable with the self-report Self-Perception Profile for Children or Adolescents, it does provide an indication of acceptance through peer reported nominations.

Measures of (2) peer support were more varied. Three studies used the classmate and close friend subscales of the Social Support Scale for Children (Harter, 1985), other measures included a five-item Friend Support Scale (Richman & Bowen, 1997), the seven-item Children's Friendship Scale (Berndt & Perry, 1986; Vernberg, Abwender, Ewell, & Beery, 1992), the Social Support Appraisal Scale from the Survey of Children's Social Support (Dubow & Ullman, 1989) and the relationship support subscale of the Friendship Qualities Questionnaire (Parker & Asher, 1993). Internal consistency was reported to be adequate for all measures. Although Tillfors et al. (2012) administered 14 items from the Friendship Qualities Questionnaire and used factor analysis to identify two latent variables of relationship support and negativity; relationship support consisted of 10 items and had good internal consistency at two time-points.

Table 3 shows that (3) Friendship quality was measured using a variety of self-reported questionnaires including the aforementioned Friendship Qualities Questionnaire (n=3), the Friendship Interview (n=1), the Adolescent Interview (adapted from the Friendship Interview; Vernberg, 1990; n=1), the Network of Relationship Inventory–Revised (n=1; Furman & Buhrmester, 1985), the Self-Perception Profile for Adolescents (n=2) and the Social Support Scale for Children (n=1). Most studies administered only one measure, La Greca and Lopez (1998), and others identified subscales from multiple measures that loaded onto a latent friendship factor. Of the three studies that used the Friendship Qualities Questionnaire, only one administered the full 40-item scale (Greco & Morris, 2005) and internal consistency was reported to be adequate or good for all three studies.

A range of (4) peer victimization measures was also used across studies including the Social Experiences Questionnaire (Crick & Grotpeter, 1996; n=7), the Revised Peer Experiences Questionnaire (n=2), the Victimization Questionnaire (n=1), the Olweus Bully/Victim Questionnaire (Olweus, 1996), the Rejection Experiences Questionnaire and the School Bullying Experience Questionnaire (n=1). Although the Social Experiences

Questionnaire was the most frequently used self-report measure, and has been shown to have good reliability and validity (Crick & Grotpeter, 1996), most studies administered different variants of the scale. While two studies administered only the relational victimization subscale to assess social exclusion and reputational threat (Hamilton et al., 2013, 2016), others administered modified versions such as by adding questions to the subscales of overt and relational victimization (Storch, Brassard, & Masia-Warner, 2003; Storch & Masia-Warner, 2004). However, internal consistency was reported to be good for the relational subscale by all but one study, and adequate for overt victimization.

Gender differences in social anxiety

A number of studies reported that there was no significant gender difference in levels of social anxiety (DeWit, Karioja, Rye, & Shain, 2011; Flanagan et al., 2008; Grills-Taquechel et al., 2010; La Greca & Harrison, 2005; Siegel et al., 2009), eight studies found that girls scored significantly higher on measures of social anxiety than boys (e.g. Hamilton et al., 2016; Storch, Brassard, et al., 2003; Yen et al., 2013); age ranges were comparable across significant and non-significant studies. For example, in an early piece of research exploring social anxiety in adolescents aged 15 to 18 years (n=250), La Greca and Lopez (1998) found that girls reported more total social anxiety than boys. This contrasts with a more recent study by La Greca and Harrison (2005) who found no significant gender difference. More specifically, differences have been found on individual subscales of social anxiety, with girls reporting significantly higher levels of fear of negative evaluation (La Greca & Lopez, 1998; Storch, Brassard, et al., 2003) and general avoidance and distress than boys (Storch, Phil, Nock, Masia-Warner, & Barlas, 2003), as well as more physiological symptoms (Storch, Brassard, et al., 2003).

The results from longitudinal studies have shown that girls self-reported significantly more social anxiety over time than boys. In studies of adolescents aged 12 to 13 years, Hamilton et al. (2016) found that girls reported higher levels of social anxiety than boys at baseline and nine month follow-up (n=410), while Hamilton et al. (2013) found that this

difference remained at 18 months (n=225). Similarly, in their study of early adolescents aged 10 to 14 years (n=490), Loukas and Pasch (2013) found that after controlling for social anxiety levels at baseline, girls reported significantly higher levels than boys one year later. This indicates that higher baseline levels do not account for the increased social anxiety experienced by girls over time. Although Grills-Taquechel et al. (2010) found that there was no significant gender difference in social anxiety scores at baseline or at two year follow up (n=77), the pattern of results differed between boys and girls. While girls social anxiety increased slightly over time, boys reported a significant decrease between age 11 and 15 years. This indicates that gender may have a moderating role in the development of social anxiety across childhood and adolescence.

Risk factors and the development of social anxiety

Peer acceptance. Six studies in this review explored the relationship between peer acceptance and social anxiety, with peer acceptance defined by Greco and Morris (2005, p.197) as “the extent to which a child is liked or noticed by their peer group”. This construct differs from friendship in that it does not require a mutually reciprocal relationship. In their cross-sectional study on peer relationships in adolescence, La Greca and Lopez (1998) used the Self-Perception Profile for Adolescents (Harter, 1988) to explore the association between peer acceptance and social anxiety. They found that low peer acceptance was significantly associated with social anxiety in boys and accounted for between 10% and 17% of variance in social anxiety scores. For girls, both close friendships and peer acceptance significantly and negatively predicted social anxiety, together accounting for between 29% and 43% of variance. Low peer acceptance continued to significantly predict higher social anxiety in girls, after controlling for the contribution of friendship quality (La Greca & Lopez, 1998). The results suggest that peer acceptance may be a significant factor in the development of social anxiety in adolescent girls. This is further supported by Hutcherson and Epkins (2009) who found that social

anxiety in pre-adolescent girls (n=100, 9 to 12 years) was significantly and negatively associated with both mother and child reported peer acceptance.

Longitudinal research has also found a significant association between peer acceptance and social anxiety. For example, Grills-Taquechel et al. (2010) found that self-perceived social acceptance significantly and uniquely predicted adolescents' social anxiety two years later with higher social acceptance from their peers associated with decreased social anxiety at age 13 to 14 years. However, as no interaction effect was found between social acceptance and gender, this indicates that the association between peer acceptance and social anxiety was consistent for boys and girls. Perceived social acceptance could therefore be considered as an important protective factor against social anxiety, with Grills-Taquechel et al. (2010) suggesting that this may highlight the importance of a sense of belonging, of which peer acceptance is an important part.

In a further cross-sectional study exploring the relationship between peer acceptance and social anxiety, Flanagan et al. (2008) used the peer social network diagram (Lansford & Parker, 1999; Parker & Herrera, 1996) to obtain adolescents' positive peer nominations (n=383, 11 to 14 years). Although similar to sociometric measures, this method only includes unilateral nominations of friendships, with group-level peer acceptance based on the number of nominations adolescents received. Flanagan et al. (2008) found a significant negative correlation between peer nominations and social anxiety, indicating that increased peer acceptance was associated with low social anxiety. Using a similar peer nomination approach, Tillfors et al., (2012) examined the prospective links between adolescent peer relations and social anxiety in Swedish students (n=1,528) aged 12 to 19 years. After controlling for age, a significant and negative concurrent correlation was found between peer acceptance and social anxiety, but only for girls at one-year follow-up. Although peer acceptance uniquely predicted decreases in social anxiety over time for both genders, this relationship was not bi-directional. This further indicates that heightened levels of social

anxiety do not account for low peer acceptance, but that being accepted by peers may serve as a protective factor against the development of social anxiety during adolescence.

Peer attachment. Two studies in this review explored the association between peer attachment and social anxiety using the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), with peer attachment defined as an affective bond between adolescents and their peers (Lu et al., 2015). In a study involving both deaf (n=112) and hearing (n=133) adolescents aged 10 to 15 years, Lu et al. (2015) found that for children with normal hearing, peer attachment was significantly and negatively correlated with social anxiety. Further analysis of the results by gender found that for hearing children, this association was stronger for girls than boys. The quality of adolescent girls' relationships with their peers (n=83, 13 to 14 years) was assessed in more depth in a study by Starr and Davila (2008), who found that social anxiety was significantly and negatively associated with the peer attachment variables of trust in friends and peer communication, after controlling for depression; the association between greater alienation with friends and social anxiety was marginally non-significant. Although this suggests that peer attachment may be specifically related to risk for social anxiety in girls, the lack of longitudinal data means that it is not possible to determine whether peer attachment plays a significant role in the development of social anxiety over time.

Friendship quality. Of the 24 articles included in this review, 7 reported on the association between adolescent friendship and levels of social anxiety. In a longitudinal study exploring the role of friendship in the development of social anxiety in adolescents aged 10 to 18 years (n=2,194), Van Zalk and Van Zalk (2015) found that adolescents who were selected more as close friends experienced decreased social anxiety over time. Moreover, gender was found to be a significant moderator in this relationship, in that girls who were selected as a friend were less likely to experience an increase in social anxiety, relative to boys. This finding is consistent with the results of Starr and Davila (2008), who found that girls who reported having fewer close friends experienced higher levels of

social anxiety, and suggests that being nominated as a friend serves as a stronger protective factor specifically for girls. Furthermore, Van Zalk and Van Zalk (2015) found that care by friends mediated the association between being selected as a friend and social anxiety, with adolescents who felt more cared for by their friends less likely to experience increased symptoms of social anxiety.

In an early longitudinal study of adolescents aged 12 to 14 years, Vernberg et al. (1992) conducted a prospective analysis of the bidirectional relationships between friendship quality (or rejection experiences) and social anxiety. They found that low companionship and intimacy in friendship predicted measures of social anxiety at two and nine months. Although there were no significant gender interactions, social anxiety was also found to predict later companionship and intimacy in friendships, leading them to conclude that there was a reciprocal relationship between social anxiety and friendship quality in early adolescence for boys and girls.

In a more recent study of predictors of social anxiety and depression, La Greca and Harrison (2005) found that low positive and high negative friendship qualities were unique predictors of social anxiety in adolescents aged 14 to 19 years ($n=421$). Despite studies finding that girls scored higher on positive friendship qualities (Greco & Morris, 2005) than boys, and lower on negative interactions (La Greca & Harrison, 2005), both Flanagan et al. (2008) and La Greca and Harrison (2005) found gender interactions to be non-significant. This indicates that the relationship between friendship quality and social anxiety was consistent between gender (La Greca & Harrison, 2005).

In contrast, La Greca and Lopez (1998) found gender differences in the relationship between friendship qualities and social anxiety, with a lack of close friendships significantly predicting general social anxiety in adolescent girls only. Similarly, in a study of preadolescent children aged 8 to 12 years ($n=333$), Greco and Morris (2005) found that positive friendship qualities were significantly and negatively correlated with measures of social anxiety for girls only. Furthermore, negative friendship quality was found to

moderate the relationship between social preference and social anxiety; girls with low social preference ratings experienced higher levels of social anxiety when their friendships were characterised by high negative friendship qualities. This indicates that girls who are less well accepted by their peers may be at increased risk of social anxiety when they experience difficulties in their friendships. Greco and Morris (2005) suggested that this gender difference may reflect the structure of boys' and girls' friendship groups, with girls tending to prefer a smaller and more intimate friendship group than boys.

Peer Support. A proportion of the studies in this review investigated the relationship between peer support and social anxiety (n=6) with mixed findings. In a small scale longitudinal study, Grills-Taquechel et al. (2010) explored risk and resilience factors that predicted anxiety during transition to middle school. They asked adolescents, aged 11 to 15 years, to complete measures of social support and social anxiety at two time points and found that classmate and friendship support at age 11 to 12 years did not significantly predict social anxiety two years later. This indicates that, in this study, peer support was not related to adolescents' social anxiety during the transition to middle school.

However, a more recent study suggested that peer support may have an important role in adolescents' social anxiety by acting as a protective factor. In a longitudinal study involving 416 adolescents aged between 11 and 14 years, Cavanaugh and Buehler (2016) explored the association between cumulative and unique sources of social support, and adolescents' social anxiety. They found that cumulative support from parents, teachers and peers was associated with decreased anxiety in early adolescence, with this association being stronger for boys than girls. Peer support was also uniquely associated with decreased social anxiety in early adolescence, a finding that was consistent between genders. As peer relationships become increasingly important during adolescence, the authors suggested that adolescents may be more likely to draw on support from their peers in social situations due to their availability and the validation they provide.

Further evidence for the role of peer support was also provided by Tillfors et al. (2012), who found that social anxiety was significantly and negatively correlated with peer relationship support at baseline and one year later. Although this modest relationship was found for both genders, peer relationship support was not found to predict decreases in social anxiety over time. In a study of preadolescent girls only, Hutcherson and Epkins (2009) researched parent- and peer-related interpersonal correlates of social anxiety. They found that classmate support and close friend support, as reported by children themselves, were significantly and negatively correlated with social anxiety. After controlling for depression, only classmate support remained significant, with self-reported loneliness found to mediate the relationship between classmate support and social anxiety. Although the cross-sectional design of this research prevents causal pathways from being identified, the results indicate that increased classmate support may serve as a protective factor for social anxiety by reducing their internal distress and feelings of loneliness.

While research indicates that peer support is associated with social anxiety, no gender differences in this relationship have been found (Cavanaugh & Buehler, 2016; Tillfors et al., 2012). In one of the earlier studies included in this review, La Greca and Lopez (1998) found that girls reported higher levels of social anxiety than boys, and more social support from their friends; the negative correlation between social anxiety and classmate support was stronger for girls. In addition, boys who experienced less support from their friends reported higher levels of general social avoidance and distress only, while girls were found to report higher levels of social anxiety across all areas. This indicates that although low levels of peer support may be involved in the development of social anxiety across both genders, friendship support may be differentially related to social anxiety in boys and girls.

One study by DeWit et al. (2011) explored the role of peer support further by investigating adolescents' perceptions of declining support during their transition to high school. In a twelve-month study involving 2,616 Canadian adolescents aged 12 to 16 years,

they found that those who reported higher levels of peer support at 13 to 14 years of age were more likely to experience an increase in social anxiety - adolescents' perception of declining support was associated with increased social anxiety. There was no difference in the predictors of social anxiety between gender, however, girls perceived themselves as having higher levels of classmate support at 13-14 years, and a slower rate of decline in support over time compared with boys. Overall, this study suggested that peer support is an important protective factor, and if adolescents experience a greater decline in support over time, then they may be placed at increased risk of social anxiety.

Peer victimization. One aspect of relationships that was considered by the majority of articles in this review (n=14) was peer victimization, with many studies providing evidence of a significant association between this factor and social anxiety. For example, in their cross-sectional study exploring peer relations in early adolescence, Flanagan et al. (2008) found that peer victimization made a significant and unique contribution to social anxiety, with this relationship being stronger for boys than girls. Although positive associations were also found by Tillfors et al. (2012), they reported that the association between peer victimization and social anxiety was stronger for adolescent girls than boys, at one-year follow-up. While exploring gender differences in the association between victimization experiences and psychosocial wellbeing in Dutch preadolescents aged 8 to 12 years (n=2,859), van der Ploeg, Steglich, Salmivalli, and Veenstra (2015) found that although social anxiety was significantly associated with a higher number of bullies in boys, it was more strongly associated with frequency of victimization in girls.

Several of the articles included in this review provided evidence regarding the relationship between types of victimization and social anxiety. Overt victimization refers to physical harm or associated threats (Storch & Masia-Warner, 2004), and relational victimization involves being harmed through manipulation or damage to interpersonal relationships, such as spreading rumours or being excluded by peers (Crick & Grotpeter, 1996). In a study examining the relationship between different types of bullying

experiences and social anxiety in Taiwanese adolescents (n=5,527) aged 11 to 18 years, Yen et al. (2013) found that victims of verbal and relational bullying, and 'physical bullying and belongings snatch', reported more severe social anxiety than non-victims. They found that perpetrators of verbal and relational bullying also reported more severe social anxiety than non-perpetrators, which suggests that although victims of bullying may be at increased risk of developing social anxiety, heightened social anxiety may also be associated with an increased risk of adolescents verbally bullying their peers. Gender did not moderate the association between involvement in bullying and social anxiety.

Evidence regarding the relationship between overt victimization and social anxiety was mixed. In a longitudinal study designed to examine the role of school connectedness as a moderator in the relationship between victimization and later adjustment difficulties, Loukas and Pasch (2013) found that overt and relational victimization at baseline was positively associated with concurrent and later social anxiety, in boys and girls. However, after controlling for baseline social anxiety and gender, only overt victimization was found to uniquely contribute to later social anxiety. Gender did not moderate the effect, indicating that overt victimization was associated with similar increases in social anxiety in boys and girls.

Despite reporting a positive association between overt victimization and social anxiety, the results of La Greca and Harrison (2005) contrast with the above findings in that overt victimization did not make a significant and unique contribution to social anxiety, when considered alongside relational victimization. Similarly, Siegel et al. (2009) reported that although overt victimization was significantly correlated with social anxiety at baseline and two months (n=228), it did not uniquely predict social anxiety concurrently or over time. This suggests that overt victimization may not contribute to social anxiety in older adolescents, with both studies involving comparable populations of adolescents aged between 14 and 19 years.

To further explore the prospective links between victimization and adolescent social anxiety, Storch, Masia-Warner, Crisp, and Klein (2005) conducted longitudinal research involving high-school students aged 13 to 15 years ($n=198$). While concurrent associations were found, overt victimization at baseline did not predict later social anxiety in boys or girls after controlling for initial levels of social anxiety. Although this is consistent with the findings of Siegel et al. (2009), it contrasts with the work of Loukas and Pasch (2013). One possible explanation for these conflicting findings could therefore be that, as the latter study involved younger participants aged 10 to 14 years, overt victimization predicts increases in social anxiety in early adolescents only.

Research has also explored the association between overt victimization and specific variables of social anxiety. In a series of cross-sectional studies published by the same lead author (Storch, Brassard, et al., 2003; Storch & Masia-Warner, 2004; Storch, Phil, et al., 2003), the results found that overt victimization was significantly and positively associated with fear of negative evaluation, social avoidance and distress of new situations, and general social avoidance, with medium to large effect sizes reported (Storch, Phil, et al., 2003). Analysis of results by gender found that overt victimization was a significant predictor of all variables of social anxiety in adolescent girls ($n=186$, 10 to 13 years), but did not predict social avoidance of new situations for boys (Storch, Phil, et al., 2003). Therefore, although overt victimization was found to be a significant predictor of social anxiety across genders, it may be uniquely linked to social avoidance in adolescent girls.

Cross-sectional studies have consistently found a significant association between relational victimization and social anxiety. For example, La Greca and Harrison (2005) found that relational victimization was positively correlated with, and uniquely predicted, social anxiety in boys and girls. Likewise, Storch, Phil, et al. (2003) found that relational victimization in Hispanic and African American preadolescents was significantly and positively correlated with social anxiety measures. However, after controlling for overt

victimization, the results indicated that relational victimization was uniquely associated with fear of negative evaluation and general social avoidance in girls only.

Further evidence of the association between relational victimization and social anxiety was found by Storch and Masia-Warner (2004). In their cross-sectional study involving adolescent girls (n=561) aged 13 to 17 years, they found that relational victimization was positively correlated with measures of social anxiety and, after controlling for prosocial behaviour, uniquely predicted all individual variables on the Social Anxiety Scale for Adolescents. Girls who reported higher levels of relational victimization experienced increased social anxiety, relative to non-victims and victims of overt victimization only, leading them to suggest that relational victimization may place girls at increased risk of later adjustment difficulties. Furthermore, although participants were recruited from a school-based non-clinical population, Storch and Masia-Warner (2004) found that girls experiencing relational victimization reported levels of social anxiety at or near clinically significant levels.

Longitudinal studies provided further evidence of the role of relational victimization in the development of social anxiety in adolescence. A recent study by Hamilton et al. (2016) involving adolescents aged 12 to 13 years, explored the relationship between relational victimization and social anxiety over three time points, each approximately nine months apart. They found that relational victimization significantly predicted social anxiety at nine months, which further predicted social anxiety at 18 months. Although this indicates that relational victimization may have a direct influence on social anxiety over time, Hamilton et al. (2016) also found an indirect effect through its association with symptoms of depression at nine months. This suggests that comorbid mental health difficulties may further exacerbate levels of social anxiety. However, in contrast with aforementioned studies, Hamilton et al. (2013) and Storch et al. (2005) found that baseline relational victimization did not predict increases in social anxiety over time. Little explanation has been offered for these conflicting findings but given the similarity in the

measures used and population age, it is possible that the results are due to the increased sample size recruited by Hamilton et al. (2016).

In an early longitudinal study involving 68 young adolescents aged 12 to 14 years, Vernberg et al. (1992) also explored the prospective links between relational victimization and social anxiety. They found that while peer exclusion at the beginning of the academic year predicted increased fear of negative evaluation two months later, only girls experienced increased social avoidance of new situations. On-going experiences of peer exclusion between two and nine months also predicted increased social anxiety across both genders. Rejection by peers during the first few months of the academic year may therefore increase girls' fear of negative evaluation and social avoidance of new situations, which, over time, has a broader impact on general social anxiety.

Further studies have found mixed results regarding gender differences. While Siegel et al., (2009) reported that gender did not moderate the concurrent relationship between relational victimization and social anxiety, this was not the case over time. Relational victimization at baseline significantly predicted increased social anxiety for girls, but not boys. Similarly, in their study of peer victimization in Finnish adolescents (n=2,070, 15 to 17 years), Ranta, Kaltiala-Heino, Frojd and Marttunen (2013) found that relational victimization at age 15 was independently associated with social anxiety at age 17 in girls, but not boys, after controlling for baseline social anxiety and victimization. Specifically, girls who experienced relational victimization at age 15 had a six-fold increase in risk of developing social anxiety at age 17. Overall, while the findings for overt victimization are mixed, research suggests that relational victimization may be a stronger predictor of social anxiety and social avoidance in adolescent girls.

A developmental pathway model to social anxiety in girls

This systematic review outlined risk factors that were common to the development of social anxiety across genders, as well as those that were uniquely linked to girls. Based on the body of evidence a framework was developed to capture both generic and gender-

specific risk for the development of social anxiety in adolescence (see Figure 2). The framework highlights that, while some aspects of peer relations may be risk factors for the development of social anxiety in adolescent girls, other elements may serve as important protective factors.

Discussion

As girls are at increased risk of social anxiety in adolescence relative to boys, a clearer understanding of risk and protective factors in terms of how social anxiety develops, and the role of peer relationships in this regard, is important in informing future empirical research and clinical intervention. To this end, the aim of this systematic review was to explore the literature on the role of peers in the development of social anxiety in adolescent girls and, specifically, to further our understanding of peer-related risk factors and gender-specific pathways. This review found that girls are at increased risk of social anxiety if they have limited numbers of close friendships, and experience negative friendships or relational bullying. Conversely, having a close friend may serve as a protective factor for girls, highlighting the importance of positive social relationships in this developmental stage. To further our understanding of peer-related risk factors, a framework has been proposed to collate both generic and gender-specific risks.

Peer victimization and social anxiety

The evidence base suggests a significant association between peer victimization and social anxiety across both genders. While some studies found that the association was stronger for boys than girls (Flanagan et al., 2008), others found that it was stronger for girls over time (Tillfors et al., 2012). More specifically, the findings on the association between overt victimization and social anxiety were mixed. A limited amount of evidence was found to suggest that overt victimization predicted social anxiety in younger adolescents, both for boys and girls (Loukas & Pasch, 2013), but did not contribute to social anxiety over time for older adolescents (Siegel et al., 2009; Storch et al., 2005). In addition, although some studies suggested that the association between relational

victimization and social anxiety was consistent across genders (Hamilton et al., 2013, 2016), others found that relational victimization placed girls at increased risk of developing social anxiety during adolescence relative to boys (Ranta et al., 2013; Siegel et al., 2009; Storch & Masia-Warner, 2004).

Research has shown that while low peer acceptance predicted social anxiety in adolescence, its effects were not unique to girls (e.g. Grills-Taquechel et al., 2010). Adolescents who experienced higher levels of peer acceptance had lower levels of social anxiety, which indicates that peer acceptance may serve as an important protective factor against the development of social anxiety in boys and girls. Research on the role of peer support was also mixed. While two studies found that peer support did not predict social anxiety over time (Grills-Taquechel et al., 2010; Tillfors et al., 2012), others found that peer support was negatively associated with decreased social anxiety across both genders (Cavanaugh & Buehler, 2016). However, research found that this association was stronger for girls than boys, with girls reporting higher levels of support from their friends, as well as increased social anxiety (La Greca & Lopez, 1998). Even when controlling for depression, this negative correlation was found to remain significant (Hutcherson & Epkins, 2009). Peer support may therefore help to protect adolescent girls from the development of social anxiety by reducing loneliness and distress. Furthermore, research suggested that friendship support may have a broader impact on girls' social anxiety than boys (La Greca & Lopez, 1998) and, where they experienced a decline in classmate support, girls were again placed at increased risk (DeWit et al., 2011).

Although the research in this review found a significant negative association between friendship quality and social anxiety, evidence on gender differences was mixed. While some studies found no significant difference (e.g. Flanagan et al., 2008), others reported that a lack of close friendships significantly predicted social anxiety in adolescent girls but not boys (La Greca & Lopez, 1998). In addition, whereas negative friendship qualities were found to be consistent across genders, positive friendship quality was significantly

and negatively associated with social anxiety in girls only (Greco & Morris, 2005). Girls with low levels of peer acceptance were found to be at increased risk of developing social anxiety when their friendships were high in negative friendship qualities (Greco & Morris, 2005). Therefore, although positive and close friendships may serve as a protective factor, research has found that where friendships are lacking or are characterised by negative qualities, girls may feel more isolated and be at greater risk of developing social anxiety.

As friendship quality was significantly associated with levels of social anxiety, this may also account for why being selected as a friend was found to be an important protective factor for girls. Receiving fewer friendship nominations was found to be a significant predictor of social anxiety over time, with gender moderating this relationship; girls who were selected as friends had a reduced likelihood of experiencing increased social anxiety (Van Zalk & Van Zalk, 2015). This suggests that adolescents with smaller friendship networks are at increased risk of developing social anxiety. As girls typically have smaller friendship groups than boys, this could help account for the importance of friendship on the development of social anxiety in girls, as well as the increased impact when they encounter relationship difficulties.

This review of the literature provides key implications for wider practice. A number of different peer-related factors have been discussed which have a significant association with social anxiety in adolescent girls, including peer acceptance, friendship quality, peer support and victimization. Research indicates that proactive and preventative intervention programmes are needed to help protect young people from the development of social anxiety by increasing their social interaction skills and improving the quality of their peer relationships. Evidence suggests that interventions are needed that promote positive friendship experiences, while also providing girls with problem solving skills to help them manage and resolve negative friendship experiences.

In addition to providing direct one-to-one or small group intervention programmes, it is also important to work at a systemic level by raising awareness of these key risk and

protective factors in schools. As pre- and early adolescence is a time of particular risk for the development of social anxiety, it is essential that school staff are able to recognize girls who may be at increased risk due to limited close friendships, negative friendship experiences or high relational victimization. Given that research has found that girls who experience relational victimization at age 15 have a six fold increase in risk of developing social anxiety by age 17 (Ranta et al., 2013), this demonstrates the importance of implementing anti-bullying programmes and raising the awareness of relational bullying in girls, including “friendship manipulation or social exclusion” (Hamilton et al., 2013, p.334).

Limitations and implications for future research

Most studies in this review used self-reported measures of social anxiety and peer relationships, which could be subject to reporter bias (Hamilton et al., 2013; Storch, Brassard, et al., 2003) and inflated findings resulting from shared method variance (Loukas & Pasch, 2013; Storch & Masia-Warner, 2004; Storch et al., 2005; van der Ploeg et al., 2015). Although it has been suggested that internal states of anxiety may not be apparent to outside observers (Siegel et al., 2009) and that self-reports may be the most accurate form of measurement (Tillfors et al., 2012), future research would likely benefit from supplementary methods, such as observations, interviews and parent-report, to provide further data for triangulation.

Another limitation of many of the studies included in this review was the cross-sectional design of the research. Although this design can provide an indication of significant associations between a wide variety of variables, it does not provide any indication of the direction of the effect (e.g. Hutcherson & Epkins, 2009; La Greca & Lopez, 1998). Therefore, although many of the cross-sectional studies found that peer factors were significantly correlated with increased social anxiety, it is impossible to determine the extent to which particular peer variables contributed to the development of social anxiety. While longitudinal studies allow for the exploration of causal pathways,

insufficient time points may be more prone to error, and limit the examination of interaction effects between variables (Grills-Taquechel et al., 2010; Loukas & Pasch, 2013). Future longitudinal research should therefore explore the development of social anxiety over a longer timeframe but with more frequent sampling.

Most studies included in this review were conducted in the USA. Although this can provide a heterogeneous sample of participants, many of the studies included predominantly Caucasian participants from middle-class socio-economic status backgrounds (e.g., Greco & Morris, 2005; Storch, Brassard, et al., 2003). This may limit the generalizability of findings and suggests that further research is required in more ethnically and socially diverse populations, as young people within these populations may be exposed to greater risk factors (e.g. discrimination) (Cavanaugh & Buehler, 2016). In addition, as the studies in this review relied on community-based populations, it is possible that young people who experienced higher levels of distress may have been less willing to participate in the research (Flanagan et al., 2008). Furthermore, in one study, participants in the highest 10% of scores on measures of social anxiety were invited to participate in an intervention and were thus excluded from the research (Storch et al., 2005).

In addition, the research in this review was of a quantitative nature, reflecting the wider research in this field. Therefore, future research would likely benefit from the use of qualitative or mixed method approaches to investigate the perspectives of young girls who are identified as being at risk of developing social anxiety. In particular, a more in-depth understanding of how peer difficulties develop, and strategies used by individuals and schools that promote positive peer relationships, would help to illuminate some of the methods that may serve as protective factors.

Finally, this review is not in itself without limitations. In particular, the systematic search was limited to articles that were in peer reviewed academic journals and the gray literature (e.g., unpublished research, doctoral theses, conference papers) was not consulted, which may highlight a publication bias. Moreover, the search was limited to the

English language, potentially missing published research in other languages not spoken by the researchers.

Conclusion

Girls are at elevated risk of developing anxiety disorders relative to boys across development. The aim of this review was to collate the available empirical literature to further our understanding of risk factors in the development of social anxiety that are common to both genders, and specific to adolescent girls. Following a systematic search of the literature, this review explored the role of peer relationships in the development of social anxiety in adolescent girls. The evidence indicated that there are a number of interacting peer-related risk and protective factors that influence the development of social anxiety. Several risk factors were common across boys and girls, including peer acceptance, peer support and victimization. Other unique factors placed girls at increased risk of social anxiety and included limited close friendships, negative friendship experiences and relational victimization. The review also highlighted the importance of friendship as a protective factor for adolescent girls in the development of social anxiety. In attempting to further our understanding of peer-related risk factors, this review has proposed a framework to capture these generic and gender-specific risks and has considered the implications for future research and practice.

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Figure 1. Flow chart detailing the results of the systematic search process and the application of the inclusion and exclusion criteria

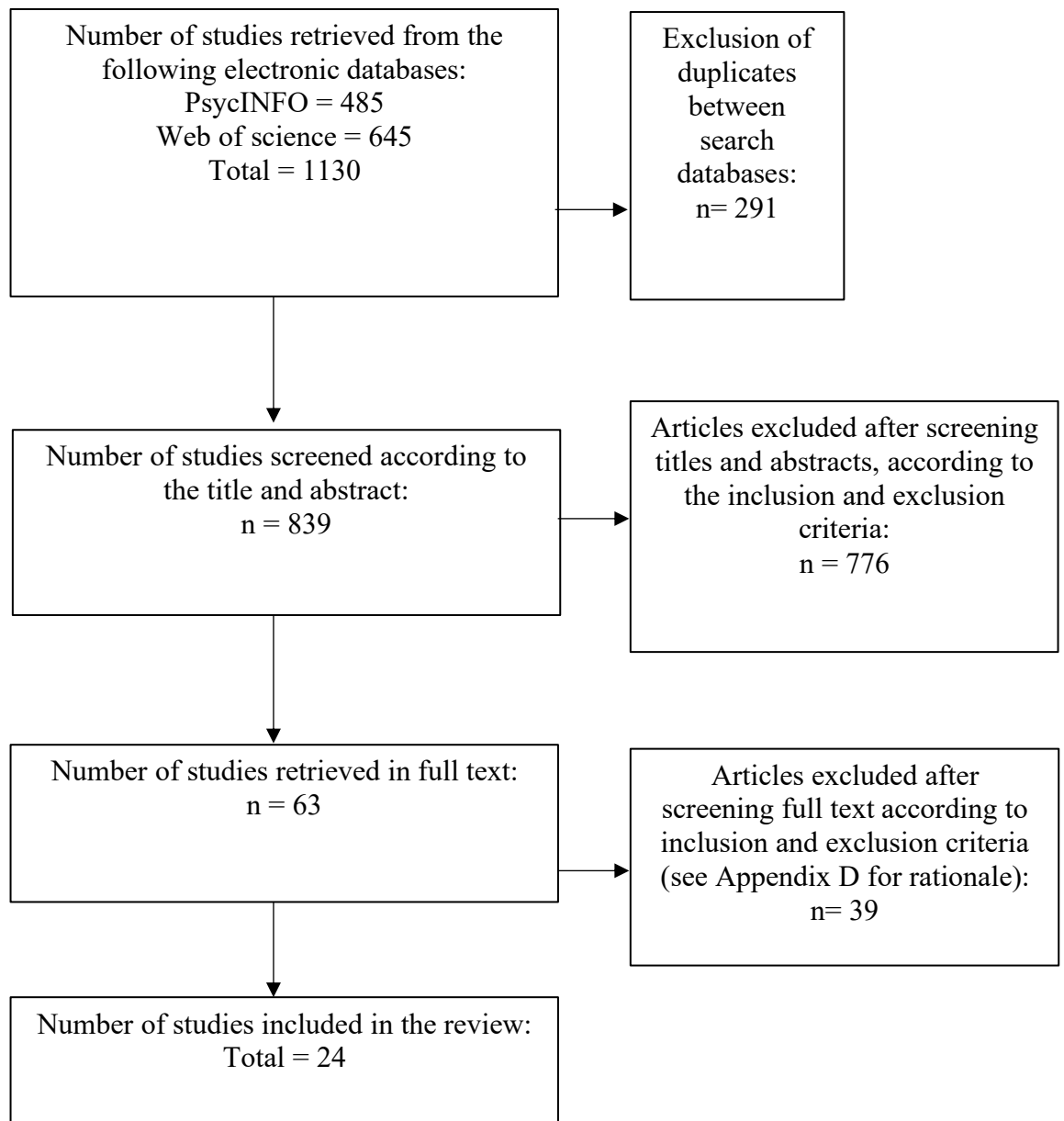


Figure 2. Developmental framework for the risk of social anxiety disorder in adolescent girls via negative peer relationships

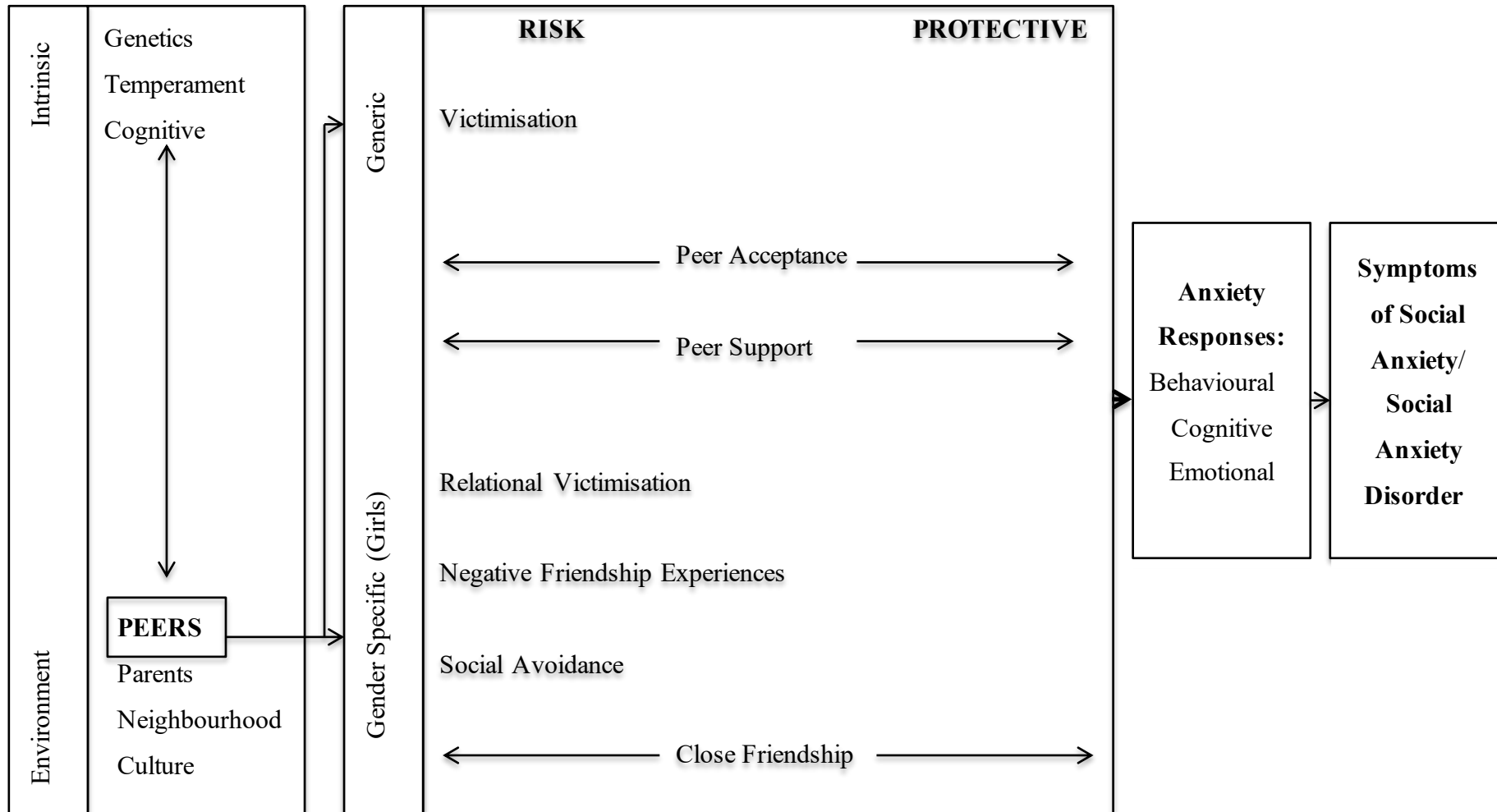


Table 1

Details for each study included in the systematic review including country of origin, design, participants, key measures and findings.

Authors and year	Country	Design	N	Mean Age in Years (Range)	% Female	Social Anxiety Measure(s)	Key Findings
Cavanaugh & Buehler (2016)	USA	Longitudinal	416	11.86 (11-14)	51	SASC-R	-Cumulative support was associated with decreased social anxiety in early adolescence for girls and boys. -Peer support was uniquely associated with decreased social anxiety across early adolescence for girls and boys.
De Wit et al., (2011).	Canada	Longitudinal	2,616	13.77 (12-16)	54	SASC-R (SAD-G)	-No significant gender differences were found for social anxiety. -Students who experienced high classmate support at age 14 years were more likely than those perceiving low support to experience an increase in social anxiety for girls and boys.
Flanagan et al., (2008).	USA	Cross-sectional	383	12.67 (11-14)	57	SAS-A	-Social anxiety was associated with positive peer nominations, peer victimisation, and friendship quality. -The relationship between social anxiety and peer victimisation was stronger for boys than girls.

Greco & Morris, (2005).	USA	Cross-sectional	333	9.45 (8-12)	57	SPAI-C	-Girls anxiety scores were negatively correlated with positive friendship qualities - Girls with low social preference ratings experienced higher levels of social anxiety when their best friendships were perceived as high in negative friendship
Grills-Taquechel et al., (2010).	USA	Longitudinal	77	11.69 (T1) 13.64 (T2) (11-15)	52	MASC	- Higher social acceptance scores were associated with decreased social anxiety from T1 to T2. -Boys social anxiety decreased significantly from T1 to T2 and while girls' social anxiety did not significantly change over time
Hamilton et al., (2016).	USA	Longitudinal	410	12.84 (12-13)	53	MASC	-Interpersonal stressors and peer victimisation significantly predicted social anxiety symptoms at T2, which further predicted social anxiety at T3. -High levels of stressors were associated with depression, which prospectively predicted high social anxiety.
Hamilton et al., (2013)	USA	Longitudinal	225	12.84 (12-13)	59	MASC	- Peer victimisation at T2 was significantly correlated with social anxiety at T3 However, relationally oriented peer victimisation did not predict prospective increases in social anxiety.

							-Gender did not significantly moderate the relationship between peer victimisation and social anxiety.
Hutcherson & Epkins, (2009).	USA	Cross-sectional	100	10.52 (9-12)	100	SASC-R	-After controlling for depression, significant negative correlations remained between social anxiety and classmate support, mother-reported peer acceptance and child-reported peer acceptance. -Loneliness was found to mediate the relationship between classmate support and social anxiety and between girls' perceived social acceptance and social anxiety.
La Greca & Lopez (1998)	USA	Cross-sectional	250	17.04 (15-18)	60	SAS-A	-Girls who reported higher levels of social anxiety also reported having fewer best friends, feeling less competent in their friendships, and perceiving friendships as less supportive, less intimate, and lower in companionship. - Close friendships and peer acceptance were significant predictors of social anxiety in girls.
La Greca et al., (2005)	USA	Cross-sectional	421	16.5 (14-19)	57	SAS-A	-Higher levels of relational victimisation predicted social anxiety, however overt victimisation was not a significant predictor. -Lower levels of positive best friendship qualities and higher levels of

							negative friendship qualities predicted social anxiety.
Loukas & Pasch, (2013)	USA	Longitudinal	490	11.69 (10-12)	53	SAS-A	-Overt and relational victimisation T1 were positively associated with social anxiety at T1 and T2 in boys and girls. -Gender was not found to moderate the effect of overt victimisation on social anxiety, with boys and girls experiencing similar increases in social anxiety.
Lu et al., (2015)	China	Cross-sectional	245	14.01	47	SASC	-There was a significant negative association between peer attachment and social anxiety, with the association being stronger for girls than boys.
Ranta et al., (2013)	Finland	Longitudinal	2,070	15.5 (T1) 17.6 (T2) (15-18)	56	SPIN	-Direct victimisation at age 15 was an independent predictor of social anxiety at age 17 for boys but not girls. -Relational victimisation at age 15 was independently associated with social anxiety at age 17 in girls such that it incurred a sixfold risk of a diagnosis of social anxiety at age 17 for girls who were relationally victimised at age 15, but no difference for boys.
Siegel et al., (2009)	USA	Longitudinal	228	16 (14-19)	58	SAS-A	-Relational victimisation at T1 significantly and uniquely predicted T1 social anxiety with higher relational victimisation associated with high social anxiety.

							-Relational victimisation at T1 significantly predicted increases in social anxiety over time for girls but not boys.
Starr & Davila, (2008)	USA	Cross-sectional	83	13.46 (12-14)	100	SAS-A	-While controlling for depression, significant negative relationships were found between social anxiety and number of close, interpersonal competence, trust in friends and peer communication -A significant positive relationship was found between loneliness and social anxiety.
Storch et al., (2003)	USA	Cross-sectional	383	14.4 (13-16)	62	SAS-A SPAI-C MASC	-Boys reported higher levels of overt but not relational victimisation than girls. -Girls reported higher fear of negative evaluation and physiological symptoms of social anxiety. -Overt victimisation was significantly associated with social anxiety measures in girls.
Storch & Masia-Warner, (2004)	USA	Cross-sectional	561	14.9 (13-17)	100	SAS-A	-Relational victims and relational/overt victims reported higher social anxiety and loneliness than non-victims and overt victims. -Victims of relational targeting reported lower levels of prosocial behaviour than non-victims.

Storch et al., (2005)	USA	Longitudinal	198	13.9 (13.15)	64	SAS-A SPAI-C	-Relational victimisation was significantly associated with T2 social anxiety when controlling for T1 scores.
Storch et al., (2003)	USA	Cross-sectional	205	10.83 (10-13)	54	SASC-R	-Girls reported higher levels of prosocial behaviour from peers and lower rates of overt victimization. -Controlling for overt victimisation, relational victimisation was uniquely associated with social anxiety in girls.
Tillfors et al., (2012)	Sweden	Longitudinal	1,528	14.69 (12-19)	49	SPSQ-C	-For girls, social anxiety was significantly negatively correlated with relationship support at T1 and T2, and with peer acceptance at T2. -At T2, social anxiety and peer victimisation were more strongly linked for females than males.
Van Der Ploeg et al., (2015)	Netherlands	Cross-sectional	2,859	Mean not reported (8-12)	49.4	SPSQ-C	-A higher number of bullies was associated with social anxiety for boys but not girls. -Frequency of victimisation was more strongly associated with social anxiety for girls than boys.
Van Zalk & Van Zalk (2015)	Western Europe	Longitudinal	2,194	13.58 (10-18)	48	Measured with 8 questions about unusual fears in different situations. Rated on a 3-point	-Girls who were selected as a friend showed a lower likelihood of increasing in social anxiety than boys who were selected as a friend.

						scale from no fear to a lot of fear.	-Being nominated as a friend had a stronger protective effect for girls than boys.
Vernberg et al., (1992)	Florida, USA	Longitudinal	68	12.9 (12-14)	44	SASC-R	-Greater rejection and exclusion was associated with increased social anxiety for girls but not boys.
Yen et al., (2013)	Taiwan	Cross-sectional	5,537	Mean not reported (11-18)	53.4	MASC – Taiwan version	-Victims of physical, verbal and relational bullying reported more severe social anxiety than non-victims. -Perpetrators of verbal and relational bullying reported more severe social anxiety than non-perpetrators, while perpetrators of physical bullying reported less severe social anxiety. -Gender did not moderate the association between involvement in bullying and social anxiety.

Note. SASC-R = Social Anxiety Scale for Children – Revised; SAD-G – Generalized Social Avoidance and Distress subscale; SAS-A = Social Anxiety Scale for Adolescents; SPAI-C = Social Phobia and Anxiety Inventory for Children; MASC = Multidimensional Anxiety Scale for Children; SPIN = Social Phobia Inventory; SPSC-C = Social Phobia and Screening Questionnaire for Children and Adolescents.