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Social Phobia and Educational and Interpersonal Impairments in Adolescence: A Prospective Study

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Abstract We examined longitudinal associations between social phobia (SP) and educational and interpersonal impairments among Finnish adolescents. Participants were 3278 adolescents (9th grade; M age = 15.5 years) who completed measures of SP and depressive symptoms; 2070 participated in follow-up two years later. Indicators for educational and interpersonal functioning were assessed for each sex separately. Multivariate analyses, controlling for depression and relevant socioeconomic covariates, indicated that for boys, age 15 SP predicted slow academic progression, being without a close friend or not having a romantic relationship, and poor support from friends and significant others at age 17. However, for girls, age 15 SP only predicted not having been involved in a romantic relationship by age 17. In conclusion, we found striking sex differences for adolescent SP as a predictor for subsequent educational and interpersonal impairments in late adolescence. SP may have a more devastating effect on boys' social and academic functioning relative to that of girls.

Keywords Social anxiety · Social phobia · Adolescents · Impairment

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Introduction

Social phobia (SP) is a chronic, yet frequently under-recognized anxiety disorder with a peak onset in adolescence, typically between 11 and 17 years of age [1, 2]. By definition, individuals with SP experience strong fears of humiliation and of appearing anxious in social situations, such as public speaking or interacting with unfamiliar people. These fears often lead to complete avoidance of social situations [3]. Fear and avoidance limit the number and quality of youths' friendships [4–6] and interfere with social interactions [7, 8].

Social phobia is frequently comorbid with other anxiety disorders, depression, and somewhat less often with disruptive disorders or substance use [9–12]. Despite impairment and distress, few adolescents with SP seek help though comorbidity increases the odds of receiving help [9–11, 13]. The persistence of symptoms of SP or heightened social anxiety also can lead to significant work, educational, and interpersonal impairments in adulthood [1, 14, 15].

There is evidence that the symptoms of SP affect adolescents' ability to go to school or work [9–13, 16]. For example, in a German population study, about 20 % of 14-

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to 24-year-old adolescents with SP reported being absent from school or work for more than 2 days a month because of their symptoms; among older adolescents with SP who had a job, more than one in three reported significantly diminished work productivity [10]. Adolescents with SP earn lower grade point averages than adolescents without SP [11] and even 90 % report impairment in school due to a social fear [16]. Further, retrospective adult studies suggest that SP is associated with failing a grade or dropping out of school prematurely [17, 18]. Data from the National Comorbidity Survey [19] revealed that, of all the mental health disorders, only SP had a specific association with being unable to perform a role transition from high school to college in late adolescence.

Studies also have addressed whether social anxiety affects functioning in interpersonal and peer relationships. Findings reveal that adolescents with elevated social anxiety and SP report few friendships [5, 20, 21], and are less liked, less accepted, and seen as less competent by their peers [5, 7, 21] compared to non-anxious youth. The quality of friendships and close relationships may also be compromised among adolescents with social anxiety [4, 22]. Socially anxious adolescents report receiving less support from classmates, and socially anxious girls in particular report less intimacy, companionship, and support in their close friendships than adolescents with low levels of social anxiety. In a follow-up of adolescents who started a new school, the initial high level of social anxiety (i.e., general social avoidance and distress) predicted less perceived intimacy and companionship in subsequent close friendships [6].

Finally, dating and romantic relationships, a central aspect of age-appropriate social functioning for middle and late adolescents, are also affected by symptoms of social anxiety [23]. Some adolescents report that intense fear and anxiety is associated with interactions with potential romantic partners, and this is termed dating anxiety [24]. In addition, socially anxious individuals show impairments in their romantic relationships, such as by controlling or even avoiding the disclosure of intimate emotions, needs, or desires in order to avoid rejection [25, 26].

Adolescents who do not have a dating relationship report higher concurrent symptoms of social anxiety [22], and adolescents who have never had a romantic relationship and those who had more negative interactions with their romantic partners report high levels of dating anxiety [27]. Longitudinal studies suggest that boys who exhibit shy and inhibited temperamental pattern in late childhood are less likely to be married and more likely to have children later than controls [28, 29]. Furthermore, males with clinical SP have been found to show higher frequencies of being unmarried relative to females with SP [30]. Overall, then, data suggest that there are social impairments associated with social anxiety, and these impairments may present themselves in different ways at different developmental phases and across gender.

In the present study, we examined the social and educational impairments associated with self-reported social phobia during middle to late adolescence (ages 15–17 years). This is a critical period for the establishment of close friendships and romantic relationships [31]. In Finland, this also is the period for making far-reaching choices regarding educational attainment, such as whether or not to transition to high school, and whether to excel in studies in order to reach desired career options. Finnish adolescents leave compulsory secondary school at age 16. Most continue their studies in high school or vocational school, few leave the educational system and seek employment or just stay at home.

Despite the importance of understanding the educational and interpersonal impact of adolescents' social anxiety, there remain significant gaps in our current knowledge of adolescents with SP. First, existing data is predominantly based on retrospective reports of adults [1, 17, 18], which may be subject to recall bias. Second, few studies assessed educational impairment in adolescents with SP [9–11] and, to our knowledge, none examined the prospective associations between adolescent SP and later educational attainment. Third, few studies examined the interpersonal functioning of socially anxious adolescents, including their friendships and/or romantic relationships [5, 22, 27], in a prospective design.

To address these gaps, the present study examined the prospective associations (from age 15 to age 17) between self-reported symptoms of SP and educational and interpersonal impairments in a large sample of Finnish adolescents. Our baseline assessment coincided with adolescents' final year in compulsory education (i.e., ninth grade). Adolescents' educational functioning was assessed by their grade point average (GPA) at the beginning and end of their final year in the compulsory school, and their reports of being enrolled as students in an educational institute, their class/school attendance, and their perceived academic progress at age 17. With respect to interpersonal functioning at age 17 we assessed engagement in close friendships and lifetime romantic relationships and qualitative aspects of interpersonal relationships, such as perceived support from friendships and significant others.

The participants' educational and social environment changed permanently in this transition from compulsory school to a voluntary educational system. School transitions have a significant impact on adolescents' friendships and peer networks [32], often meaning that friendships have to be formed anew. The specific study questions were as follows:

1. Is there a predictive association between self-reported SP at age 15 and a lower GPA at graduation (i.e., the end of the ninth grade) as compared to the GPA provided a year earlier?

2. What are the prospective associations between self-reported SP at age 15 and: (a) completely dropping out of school/work, (b) school/class non-attendance, and (c) perceived academic progress 2 years later?

3. What are the prospective associations between self-reported SP at age 15 and being engaged in close friendships and romantic relationships at age 17?

4. What are the prospective associations between self-reported SP at age 15 and receiving support from close friendships and significant others at age 17?

Methods

Procedure

The study was approved by the Ethics Committee of Tampere University Hospital. It was part of the Adolescent Mental Health Cohort Study [33]. At baseline (T1), 3278 adolescents (1609 girls or 49 %) from all Finnish-speaking compulsory secondary schools in two Finnish cities, Tampere (200,000 inhabitants) and Vantaa (180,000 inhabitants) participated. In the Fall of the ninth grade, during a school session, the adolescents completed a questionnaire that contained measures of mental health (such as self-report scales for depression, social phobia, and eating disorders), health behavior (such as substance use and eating habits), and questions relating to family, peer relationships, and educational and work functioning (such as family structure, relationships with parents, SES, friendships, bullying and measured and perceived school performance). We mailed the questionnaire with two reminders to adolescents who were absent from school on the day of data collection. The mean age of the adolescents at T1 was 15.5 (SD = 0.39) years. The response rate for the baseline survey was 94.4 %. Participants signed written informed consent forms prior to answering to the survey. Finnish legislation on medical research allows subjects aged 15 years and older to consent alone. However, parents of the subjects were informed in advance by a letter.

Adolescents who participated at baseline were contacted for a 2-year follow-up (T2) through multiple approaches. T2 testing was organized in secondary schools (i.e., high schools and vocational schools). Adolescents who could not be reached through schools were contacted by mail or email. A total of 2082 surveys were received (54 % from school surveys, 44 % by mail, 2 % by email). Ten surveys were excluded because of obvious facetiousness. The final sample represents 63.1 % of the adolescents that responded to the first survey.

Participants

The study participants were the 2070 adolescents who completed the survey at both T1 and T2. At T2, the mean age of the participants was 17.6 years (SD = 0.41). Of this sample, 56.4 % (1167) were girls and 43.6 (903) were boys; 62 % were enrolled in upper secondary school (i.e., high school) and 38 % were in vocational school. Of the participants, 27 % lived in a non-intact family. Few adolescents had incomplete data: 0.2–0.6 % on social phobia, 0.5–1.4 % on depression and psychosocial covariates, 0.4–1.4 % on educational impairment, 1.2–1.5 % on interpersonal impairment and social support either at T1/T2. The respondents represent the general adolescent population in Finland, where more than 90 % of children and adolescents attend grades 1–9 (7–16 years of age) in the public schools.

Attrition

Adolescents who participated at T1 and T2 were compared to those who only completed T1 measures on demographic and the key study variables using Chi-square statistics or Fisher's exact test, as appropriate. Of those who participated at T1, fewer girls (28 %) than boys (46 %) dropped out by follow-up ($p < 0.001$). Attrition was significantly associated with socio-demographic variables. Adolescents who did versus did not participate at follow-up were more likely to come from an intact versus a divorced family (65 vs. 58 %, $p < 0.001$) and to have parents' with a high educational level (67 vs. 63 %, $p = 0.025$). Adolescents who completed the follow up did not differ from those who participated only at T1 on the frequency of social phobia (9 vs. 8 %, $p = 0.51$). However, frequent school non-attendance at T1 was more common among study dropouts as compared with study completers (7 vs. 3 %, $p < 0.001$). Having no close friends at T1 was as frequent (14 %) among completers as it was among dropouts. There was some difference in not responding to measures of social support from friends or a significant other (both 2 vs. 3 % among completers and dropouts, $p = 0.005$). Of the covariates, depression at T1 was more frequent among dropouts than completers (12 vs. 9 %, $p = 0.020$).

Measures

Several measures were completed at T1, including adolescents' reports of social anxiety, depressive symptoms, academic functioning (GPA), and family stressors (relocation, parental employment). At T2, adolescents again

completed measures of social anxiety and depression, and also measures that assessed their educational functioning, interpersonal functioning, and social support.

Social Phobia

The Social Phobia Inventory (SPIN) [34], a 17-item measure of fear, avoidance and physiological arousal in social situations, was used to assess SP. Evidence supports the reliability and construct validity of this instrument for American (English-speaking) and Finnish adolescents [35, 36]. A clinical cut-off score of 24 has been found to yield good sensitivity and specificity (81 and 85 %, respectively) relative to SP diagnosis among Finnish adolescents [36]. Based on this measure, adolescents were classified as having self-reported SP (24 and above), or no self-reported SP (0–23).

Educational Functioning

Four indicators of educational functioning were assessed: academic achievement, school/work dropout (defined as not being currently in school in combination with not being occupied in full-time or part-time job), frequent non-attendance in classes, and academic progression. First, academic achievement was assessed by adolescents' reports of their GPA. At T1, adolescents were asked: "*In your report from the last season (i.e., eighth grade), what was your grade point average?*" At T2, they were asked: "*In your graduate report from the ninth class, what was your grade point average?*" The possible range is from 5.0 to 10.0. All participants with a lower GPA at T2 than at T1 were defined as having decreased GPA.

Second, school/work dropout at T2 was measured by cross-tabulating responses from two questions administered at T2: "*I am currently studying*" with response alternatives: "full time"/"part-time"/"not at all", and: "*I am currently working*" with response alternatives: "full-time"/"part-time"/"not at all". Adolescents who reported that they were both not studying and not working full or part-time at T2 were defined as school/work dropouts ($n = 47$).

Third, one item from the Youth Self Report (item 101: "*I cut classes or skip school*") was used to assess poor class/school attendance over the previous 6 months. *The Youth Self-Report* (YSR) [37] is a widely used and well-validated measure of behavior problems. YSR items are rated on a 0–2 scale (0 = "not true", 1 = "somewhat or sometimes true", 2 = "very true or often true"). A variable reflecting frequent non-attendance at classes was created by dichotomizing adolescents' responses: those who endorsed "very true or often true" for item 101 were considered frequent non-attenders compared with those who endorsed "not true" or "somewhat or sometimes true".

Finally, we assessed adolescents' perceived academic progression with a question: "*How are you progressing in your studies?*" The response alternatives were: "faster than planned", "in the same pace as I had planned", "slower than I had planned", and "I do not study at all". Those endorsing the last two responses were defined as having slower academic progression.

Interpersonal Functioning

Two survey questions evaluated adolescents' participation in close friendships and romantic relationships. Specifically, having a close friend was assessed with the question: "*Do you have really close friends with whom you can share your thoughts? How many?*" The response alternatives were: "I have no close friends", "I have one close friend", "I have two close friends", and "I have several close friends". Having been involved in a romantic relationship was assessed with the question: "*Have you been involved in a steady dating relationship?*" The response alternatives were: "Yes", "Not at the moment, but I have been involved in a steady dating relationship before", and "I have never been involved in a steady dating relationship before".

Social Support

The Perceived Social Support Scale-Revised (PSSS-R) [38] was used to assess support from friends and significant others. The PSSS-R contains 12 items that are rated on a five-point Likert scale; four items measure perceived support for each of three factor-analytically derived subscales: family, friends, and a significant other. Representative items for support from friends and from a significant other include: "*My friends really try to help me*", and "*There is a special person with whom I can share my joys and sorrows*", respectively. The friend subscale applies to friendships, whereas the significant other subscale applies to close interpersonal relationships, such as an adult close friend or a romantic partner. The Finnish adaptation of the PSSS-R has shown adequate psychometric properties among adolescents [39]. Adolescents were considered to have "poor social support" from friends if their score on the friends subscale was at or below the 25th percentile. Similarly, adolescents were considered to have "poor social support from a significant other" if their score on the significant other subscale was at or below the 25th percentile. The cut-offs for low social support were calculated separately for boys, girls, and the total sample.

Covariate Measures

Two additional measures were administered. We assessed adolescent depressive symptoms at T1 to control for the frequent comorbidity between SP and depressive symptoms. Two key family-related life events were assessed at T2. Previous research has shown that they have a disrupting effect on adolescents' social networks and may be associated with educational and interpersonal impairments [10, 40]. Thus, we controlled each of these variables in our prospective study analyses.

The Beck Depression Inventory—Short version (BDI) [41] was used to assess depressive symptoms. The BDI has been widely used with adolescent samples [42], and evidence supports the psychometric properties of the Finnish version [43] for use with Finnish adolescents [44]. A clinical cut-off score of 8 represents "moderate to severe" depression [45], and was used in this study to identify depressed adolescents: self-reported depression (8 or above), or no self-reported depression (0–7).

The Life Events Checklist (LEC) [46] was used to assess residential instability and parental unemployment. LEC item 1 asks whether the adolescent has moved during the past year, with 0 = has not moved, and 1 = has moved. LEC item 7 asks whether one or both of the parents have been unemployed during the past year, with 0 = neither has been unemployed, and 1 = one or both parents have been unemployed.

Statistical Analysis

In preliminary analyses we compared those with and without SP on a number of educational and interpersonal measures. Multivariate analyses examined associations between SP and educational and interpersonal functioning using a series of logistic regression analyses that controlled for co-occurring depressive symptoms [47, 48] and for potentially confounding socio-demographic factors (residential stability, parental unemployment). Finally, special emphasis was given to evaluating potential gender differences in the associations between social anxiety disorder and adolescents' educational and interpersonal functioning.

Descriptive Data and Between-Groups Analyses

Simple frequencies for SP and the key study variables at T2 were calculated for the group of participants with T1 SP and compared to those without T1 SP. The two groups were then compared with for each of the key T2 variables. Chi-square analyses or Fisher's exact tests were used, as appropriate.

Multivariate Analyses

Logistic regression analysis (LRA) was used to evaluate the prospective associations between T1 SP and T2 educational impairment (school dropout, non-attendance to classes, slow academic progress), as well as T2 interpersonal impairment (having no close friend, having had no lifetime romantic relationship, poor social support from close friends, and poor social support from a significant other). In these analyses, T1 SP and covariates (T1 depression, T2 relocation, and T2 parental unemployment) were entered simultaneously to the model as independent predictor variables and the key T2 variables each, in turn, as the dependent endpoint variables.

Because lowering of the GPA was assessed from the end of the eighth grade (reported at T1) to the end of the ninth grade (reported at T2), we used T1 relocation and T1 parental unemployment as covariates in this multivariate analysis. Preliminary analyses were performed for the entire sample and for each sex separately. These analyses indicated significant interactions between sex and SP and between sex and other covariates in several analyses. Because one of the goals of the present study was to examine sex differences, we present all the results for each sex separately. However, results from the LRAs also are presented for the entire sample to further illustrate the effect of sex on the results. Adjusted Odds Ratios (AORs) with 95 % confidence intervals are reported. The analyses were done using SPSS 19.0.

Results

Unadjusted Analyses: Associations Between SP and Educational and Interpersonal Impairment

Educational Functioning

There was no significant association between SP at age 15 and lowering of GPA during the last year in compulsory school. As seen in Table 1, the frequency of adolescents with lowering of their GPA was somewhat higher among boys with SP versus boys without SP, however the difference was in the opposite direction for girls. Dropping out of school/work at age 17 was slightly more prevalent among boys with SP at age 15 than among those without SP, and this association was borderline significant ($p = 0.051$). Furthermore, poor class attendance at age 17 was more frequent among both boys and girls with SP at age 15 relative to boys and girls without SP (both ps < 0.05). Lastly, perceived academic progress at age 17 was more prevalent among those with SP at age 15 relative to those without SP, but only among boys ($p < 0.05$).

Table 1 Associations between self-reported social phobia at age 15 and educational and interpersonal impairments at age 17: unadjusted between-groups analyses

	Social phobia at age 15 (%)	No social phobia at age 15 (%)	Statistic	p
Educational impairments at age 17				
Lowering of GPA (during the final year of compulsory school)				
Boys	26.1	18.6	$\chi^2 = 2.293$	0.130
Girls	12.2	18.3	$\chi^2 = 2.678$	0.102
Dropout of school/work				
Boys	7.2	2.7	Fisher's exact test	0.051
Girls	1.8	1.7	Fisher's exact test	1.000
Frequent class non-attendances				
Boys	11.6	4.7	Fisher's exact test	0.023*
Girls	12.8	7.3	$\chi^2 = 4.411$	0.036*
Perceived slow academic progression				
Boys	20.3	10.2	$\chi^2 = 6.712$	0.010*
Girls	17.1	13.4	$\chi^2 = 1.192$	0.275
Interpersonal impairments at age 17				
Having no close friends				
Boys	30.3	10.2	$\chi^2 = 23.826$	0.000***
Girls	6.0	5.9	$\chi^2 = 0.003$	0.959
Having had no romantic partners in lifetime				
Boys	52.2	33.8	$\chi^2 = 9.380$	0.002**
Girls	34.2	31.2	$\chi^2 = 0.429$	0.512
Perceived low support from friends				
Boys	47.8	22.7	$\chi^2 = 21.696$	0.000***
Girls	28.4	17.4	$\chi^2 = 8.375$	0.004**
Perceived low support from a significant other				
Boys	43.5	22.2	$\chi^2 = 15.909$	0.000***
Girls	31.0	22.1	$\chi^2 = 4.749$	0.029*

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Interpersonal Functioning (See Table 1)

For adolescents with and without SP at age 15, there was a clear difference between the sexes with regard to the frequency of having no close friends at age 17. Specifically, for boys, a significantly greater percentage (30 %) of those with SP at age 15 had no close friends at age 17 compared to only 10 % of the boys in the no-SP group ($p < 0.001$). For girls, there were no differences between the SP groups with respect to close friends at age 17.

Similarly, we observed sex differences for the association between having SP at age 15 and not having been involved in a romantic relationship by age 17. Boys with SP reported the lack of any romantic relationships more frequently (52 %) than boys without SP (34 %, $p < 0.005$). For girls, there were no differences in romantic relationship involvement for those with and without SP.

For perceived social support, both boys and girls with SP at age 15 more frequently reported low friendship support at age 17 compared to boys and girls without SP, respectively (both $ps < 0.005$). Similar findings emerged with respect to support from significant others at age 17, especially for boys. Specifically, a greater percentage of boys with SP at age 15 (44 %) reported low support from a significant other 2 years later than did boys without SP (22 %, $p < 0.001$). Girls with SP at age 15 also reported lower support from a significant other 2 years later (31 %) than did girls without SP (22 %, $p < 0.001$).

Table 2 Multivariate analyses: predictive associations between self-reported social phobia at age 15 and socioeconomic covariates with educational functioning at age 17

Predictor variable	AOR with (95 % CI)		
	Boys	Girls	All
Lowering of GPA during the final year of compulsory secondary school			
T1 social phobia	1.4 (0.8–2.6)	0.5 (0.3–1.0)*	0.8 (0.5–1.3)
T1 depression	1.2 (0.6–2.3)	1.3 (0.8–2.2)	1.2 (0.8–1.8)
T1 relocation during past 12 months	1.1 (0.7–2.0)	1.3 (0.8–2.3)	1.2 (0.8–1.8)
T1 parental unemployment during past 12 months	0.9 (0.4–1.7)	0.7 (0.4–1.4)	0.8 (0.5–1.3)
Dropping out of school/work by age 17			
T1 social phobia	2.4 (0.9–6.7)	0.3 (0.1–1.5)	1.0 (0.4–2.4)
T1 depression	2.4 (0.8–7.4)	5.5 (2.2–13.9)***	3.2 (1.5–6.5)**
T2 relocation during past 12 months	3.1 (1.2–8.5)*	1.0 (0.2–4.5)	2.1 (1.0–4.7)
T2 parental unemployment during past 12 months	1.2 (0.3–4.3)	1.4 (0.3–6.0)	1.3 (0.5–3.4)
Frequent non-attendance to classes at age 17			
T1 social phobia	1.7 (0.6–4.4)	0.9 (0.5–1.9)	1.2 (0.7–2.1)
T1 depression	1.8 (0.6–5.1)	3.1 (1.7–5.6)***	2.8 (1.7–4.7)***
T2 relocation during past 12 months	1.1 (0.3–3.2)	1.5 (0.7–3.2)	1.3 (0.7–2.4)
T2 parental unemployment during past 12 months	2.0 (0.7–5.4)	3.0 (1.5–5.7)**	2.5 (1.4–4.3)**
Perceived slow progression in studies at age 17			
T1 social phobia	2.1 (1.0–4.0)*	0.6 (0.3–1.1)	1.0 (0.6–1.5)
T1 depression	1.6 (0.7–3.5)	4.3 (2.7–7.0)***	3.2 (2.1–4.7)***
T2 relocation during past 12 months	1.9 (0.9–3.7)	1.9 (1.1–3.4)*	1.9 (1.2–3.0)**
T2 parental unemployment during past 12 months	2.1 (1.0–4.3)*	2.0 (1.1–3.6)*	2.0 (1.3–3.1)**

AOR (95 % CI): adjusted odds ratio with 95 % confidence intervals

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Multivariate Analyses

Educational Functioning

As can be seen in Table 2, we did not find an association between SP at age 15 and lowering of the GPA during the ninth grade for boys. However, surprisingly, for girls, SP at age 15 was associated with a *reduced* risk for lowering of the GPA during the last year in the compulsory school compared to girls without SP [AOR 0.5 (0.3–1.0), $p = 0.045$]. With respect to dropping out of school/work by age 17, SP at age 15 did not maintain its predictive association with this variable among either sex in the LRA, controlling for other variables. The AOR values [boys 2.4 (0.9–6.7), girls 0.3 (0.1–1.5)] suggest that the predictive risk of SP for later dropout may be in the opposite direction for boys and girls (see Table 2).

For school non-attendance, we found no predictive associations between SP at age 15 and being frequently absent from classes or school at age 17 for either boys or girls. Finally, in terms of perceived academic progress, SP at age 15 was associated with a heightened risk for slow academic progress at age 17 among boys [AOR 2.1 (1.0–4.3), $p = 0.037$] (see Table 2).

Interpersonal Functioning (See Table 3)

Consistent with the unadjusted analyses, the LRA indicated a strong predictive association [AOR 3.8 (2.0–6.9), $p = 0.004$] between boys' SP at age 15 and having no close friends at all at age 17. In contrast, for girls, no prospective association between SP at age 15 and having no close friends at age 17 was found. With regard to engagement in romantic relationships, SP at age 15 predicted not having been involved in a romantic relationship by age 17 for both sexes [AORs among boys and girls 2.1 (1.3–3.6), $p = 0.004$, and 1.7 (1.1–2.7), $p = 0.022$, respectively].

We obtained strong associations between boys' SP at age 15 and low friend support at age 17 [AOR 3.2 (1.9–5.4), $p < 0.001$]. In contrast, we found no predictive association between these variables for girls. Lastly, the predictive association of T1 SP to perceived low support from significant others at age 17 was similar to that observed for friend support. For boys, SP at age 15 [AOR

Table 3 Multivariate analyses: predictive associations between self-reported social phobia at age 15 and socioeconomic covariates with interpersonal functioning at age 17

Predictor variable	AOR with (95 % CI)		
	Boys	Girls	All
Engagement in close friendships at age 17			
T1 social phobia	3.8 (2.0–6.9)***	0.6 (0.2–1.4)	1.7 (1.1–2.8)*
T1 depression	1.1 (0.5–2.5)	3.5 (1.8–6.7)***	1.6 (1.0–2.7)*
T2 relocation during past 12 months	0.7 (0.3–1.8)	1.0 (0.4–2.6)	0.9 (0.5–1.8)
T2 parental unemployment during past 12 months	1.0 (0.4–2.4)	0.4 (0.1–1.9)	0.7 (0.3–1.5)
Engagement in romantic relationships at age 17			
T1 social phobia	2.1 (1.3–3.6)**	1.7 (1.1–2.7)*	1.8 (1.3–2.6)**
T1 depression	1.1 (0.6–2.1)	0.4 (0.2–0.6)***	0.5 (0.4–0.8)**
T2 relocation during past 12 months	0.8 (0.4–1.4)	0.6 (0.3–1.1)	0.7 (0.4–1.0)*
T2 parental unemployment during past 12 months	0.7 (0.4–1.3)	1.3 (0.8–2.1)	1.0 (0.7–1.5)
Perceived low support from friends at age 17			
T1 social phobia	3.2 (1.9–5.4)***	1.0 (0.6–1.6)	1.8 (1.3–2.6)**
T1 depression	0.8 (0.4–1.6)	4.1 (2.6–6.3)***	1.8 (1.2–2.5)**
T2 relocation during past 12 months	1.1 (0.6–2.0)	0.9 (0.5–1.7)	1.1 (0.7–1.7)
T2 parental unemployment during past 12 months	1.3 (0.7–2.4)	1.1 (0.6–2.1)	1.2 (0.8–1.9)
Perceived low support from a significant other at age 17			
T1 social phobia	3.1 (1.8–5.2)***	1.0 (0.6–1.6)	1.7 (1.2–2.4)**
T1 depression	0.7 (0.4–1.4)	2.8 (1.9–4.3)***	1.2 (0.8–1.7)
T2 relocation during past 12 months	1.1 (0.6–2.1)	1.0 (0.6–1.8)	1.3 (0.9–2.0)
T2 parental unemployment during past 12 months	1.3 (0.7–2.5)	1.9 (1.1–3.2)*	1.4 (0.9–2.1)

Perceived low support = score below 25th percentile on the PSSS-R friend/significant other subscale, calculated separately for boys/girls/all

AOR (95 % CI): adjusted odds ratio with 95 % confidence intervals

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

3.1 (1.8–5.2), $p < 0.001$] predicted low support; however, no association was observed for girls.

Role of Covariates

Comparing the results from the unadjusted between-groups analyses (Table 1) to the results from the multivariate analyses (Tables 2, 3) illustrates how the inclusion of covariates in the analyses modified the associations between social phobia and both educational and interpersonal impairment. The most notable of the covariates was the role of depression, which is often comorbid with SP. Depression at age 15 had clear predictive associations to girls' but not boys' educational impairment at age 17. This was evident in all three T2 educational indicators: dropping out of school/work, frequent school non-attendance, and not progressing academically, with AOR's ranging from 3.1 to 5.5 among girls.

Moreover, depression had differential associations with interpersonal impairments for boys and girls. In boys, depression at age 15 was not associated with interpersonal impairment at age 17. In contrast, among girls, depression showed predictive associations with interpersonal

impairments at age 17, including not having a close friend, and having low levels of support from friends and significant others (AOR's ranging from 2.8 to 4.1). Interestingly, in girls, depression at age 15 was associated with an *increased* likelihood of having had a lifetime romantic partner by age 17 [AOR for not having a lifetime romantic partner was 0.4 (0.2–0.6), $p < 0.001$].

Regarding the other covariates, relocation during the previous year had an adverse impact on boys' dropping out of school by age 17, and also was associated with girls' perceptions of poor academic progress at age 17 (see Table 2). Finally, we note that parental unemployment during the previous year was associated with girls' poor academic attendance and perceptions of slow academic progress at age 17, and also with girls' perceived low support from a significant other at age 17.

Discussion

The present study followed a large cohort of Finnish adolescents over a 2-year period from middle to late adolescence. In the Finnish context, this period coincides with a

major change in the educational and social contexts. None of the adolescents continued in the same school, thus reflecting changes in their peer groups and in their educational pathways. Few adolescents started working and even fewer dropped out of school and work. This setting allowed us to examine the role of SP in predicting subsequent educational and interpersonal functioning, while minimizing contextual factors that could influence adolescent functioning (i.e., factors related to a given school, or to peer group dynamics).

The main study findings suggest that there are different longitudinal associations between mid-adolescence (i.e., age 15) social anxiety disorder and educational and interpersonal impairments in later adolescence (i.e., age 17) for boys and girls. For boys, SP at age 15 independently predicted both slow academic progress and interpersonal impairment in several areas (involvement in close friendships and romantic relationships, low levels of support from friends and significant others) at age 17. In contrast, for girls, SP at age 15 only predicted having not been involved in a romantic relationship by age 17. In addition, the predictive role of depression at age 15, which is often comorbid with SP [9–12], was largely different for boys and girls. Specifically, among boys we found no predictive associations for depression at age 15, whereas among girls depression had strong predictive associations with all the age 17 indicators of educational and interpersonal impairment. This underscores the role of depression as a major, broadly impairing health issue for adolescent girls, and research suggests a possible role for associated features of hopelessness predicting future impairments in social functioning [49]. Our findings are discussed in greater detail below, starting with the between-group comparisons and continuing to the controlled multivariate analyses.

Educational Impairment

The comparisons between adolescents with and without SP at age 15 suggested gender-specific longitudinal associations between mid-adolescence SP and educational impairments at age 17. In boys, SP predicted most subsequent educational impairments (dropping out from school/work, being frequently absent from school, not progressing in studies), whereas among girls SP predicted just being frequently absent from school. These results are broadly in line with a body of research demonstrating compromised educational functioning [9–12, 16], and lowered educational achievement [17–19] for those with SP during the middle and late adolescent years.

However, the most methodologically robust findings were from the multivariate analyses. First, these analyses indicated that, in fact, SP was associated with a *decreased* risk for lowering of GPA among girls. Prior research has mainly found greater educational and occupational

impairments in socially anxious females: socially anxious girls/women have been reported to suffer from impairment in school-related activities [16], not to complete high school [50], to earn lower grades in college [51], and to suffer later from a broader range of work-related impairments than boys/men with SP [30]. Our findings contrast with those findings and suggest that, at least in the relatively short term (i.e., during the ninth grade), SP symptoms may even protect girls from academic impairment. One possible interpretation is that socially anxious mid-adolescent girls may, more so than boys, display a perfectionist/performance-oriented manner [52] in school, possibly protecting themselves from negative classroom attention. It may also be the case that socially anxious girls have less supportive friendships and are less likely to be romantically involved [5, 22] (also see discussion below), and as a result may focus their attention on academic pursuits rather than personal relationships.

Second, findings from the multivariate analyses indicate that the role of SP as a predictor of future academic impairment could be more prominent for boys than for girls in this developmental phase from age 15 to 17 years. How could this be accounted for? There is some evidence that socially anxious adolescent boys display a higher frequency of avoidant behavior than socially anxious adolescent girls [53, 54], which could affect boys' academic performance. Another possibility is that socially anxious boys (compared to socially anxious girls) might be more likely to have co-occurring conduct disorders [12], which in turn are associated with poor educational and academic outcomes [55]. Underlying conduct disorders might contribute to deficits in effortful self-control and negative emotionality, which may play a role in boys' academic impairment [56]. Furthermore, boys who do self-report social fears and embarrassment (which are inconsistent with male gender role expectations of independence) may suffer from more severe symptoms relative to girls, who may disclose also milder symptoms as significant, because it is more socially acceptable for them (see Rapee et al. [57]). Further research is needed to better understand the current pattern of findings.

Third, the relative role of depression at age 15 as a predictor of future educational impairment was different for boys and girls, with depression associating broadly to subsequent educational impairments in girls, but not in boys. This was surprising, although in line with Aderka et al. [14], who found no additive effect of depression in combination with SP with regard to impairment in work/educational domain of functioning in adults with SP. It is possible that SP symptoms in the early phase may be associated with impairment in a different way for boys and girls compared with later SP symptoms. For example, as age increases, the demands for independent social functioning in educational settings may also increase for both genders—thus leading to

educational harm for girls later on [14, 52, 58]. Clearly, further study is warranted. Our results call for future investigations to better disentangle the effects of depression from comorbid social anxiety [48].

We did not find associations between SP at age 15 and the most severe indicators of academic impairment, namely dropout from school/work, as previously reported in some studies [18, 19, 50]. In this developmental phase, the severe effects of SP on terminating school or work, as reported by retrospective studies, may not have yet emerged. Methodological differences between the present study and the aforementioned studies (i.e., age range, use of self-report, and controls for depressive comorbidity in the present study) may account for these differences. These distinctions seem important, however, as among girls we observed a clear role for depression as a predictor of later dropout. Because we lost more boys than girls in the follow-up, and because it is possible that dropping out of school or work may be more common among the study dropouts, we cannot definitely rule out the possibility of significant associations between SP or depression at age 15 and subsequent dropout from school/work, especially among boys. Worth mentioning is that boys seemed to be more vulnerable to effects of recent relocation, which has an additive effect on the symptoms of social anxiety [6]. These findings extend the results from a number of adolescent and adult studies in which sex differences in educational impairment were not assessed [9–11, 18] or did not emerge [17].

Interpersonal Impairment

With regard to the second main outcome—interpersonal impairments—unadjusted group comparisons showed SP at age 15 predicted all of the interpersonal impairment indicators at age 17 among boys, and girls' low level of support from friends and significant others at age 17. These results are compatible with findings of reduced number of friendships [20, 21], low quality of friendships [5, 6, 8, 22], and infrequent involvement in romantic relationships [22] among socially anxious adolescents.

However, in the more rigorous multivariate analyses, the above gender-specific findings sharpened: the predictive role of SP at age 15 was maintained among boys with regard to *all* of the interpersonal impairment indicators at age 17. In contrast, among girls a predictive association of SP at age 15 was noted only with regard to future involvement in romantic relationships. Our prospective findings add to previous findings of concurrent impairment in close and romantic relationships among socially anxious girls and boys [22].

It is striking that 30 % of boys (and just 6 % of girls) with SP at age 15 reported no close friendships at age 17. Clearly, SP may impact friendships in a different way across genders—be a complete barrier for gaining close relationships

among boys, but rather operate within dyadic friendships in girls [58], and possibly lead to reduced intimacy inside such relationships for girls [8]. In future studies, it could be of value to examine whether engaging in close dyadic friendships, which is typical for girls [5, 58], could contribute to socially anxious girls becoming overly dependent on their close friend's presence to reduce their own social anxiety in larger social gatherings [25, 59]. If this is the case, this behavioral pattern of dependence on a close friend could maintain or worsen girls' social anxiety over time.

Our results provide an interesting contrast to the retrospective and prospective studies [28–30] that found a greater risk of socially anxious males forming a family later in adulthood or not marrying at all. Our study results were similar for boys. However, for girls with SP at age 15, the increased likelihood of not having formed a romantic relationship by age 17 only emerged after we controlled for depression at age 15. Likely this resulted from the fact that depression at age 15 was associated with *increased* odds of girls' dating at age 17. Similarly, others have found strong associations between romantic involvement and depression among adolescent girls [60] and that depressive symptoms among adolescent girls are prospectively related to dating and sexual activity one year later [61]. Our findings suggest that depressed girls may seek out dating or romantic relationships more so than non-depressed girls. On the whole, we were able to disentangle the inhibiting effect of SP to forming romantic relationships in *both* sexes by controlling for the comorbidity between SP and depression. Thus, results by Caspi et al. [28], Kerr et al. [29], and Xu et al. [30] should be seen in the light of the possible confounding role of comorbid depression in those studies.

Finally, for perceived support, our results reveal a low level of support from friends and significant others among socially anxious adolescents, compatible with previous findings [5]. However, only among boys was antecedent SP predictive of later low friend/significant other support. These results, combined with the role of boys' SP to predict subsequent non-involvement in close friendships, further emphasize the detrimental and possibly even causal effect of boys' SP symptoms across many facets of interpersonal functioning. Thus, boys with social anxiety may proceed on a lonely track, not being able to form close relationships and gain support from them. Although socially anxious girls may be able to form a few close relationships, these relationships may be compromised in their emotional disclosure and quality due to social anxiety and social evaluative fears [5, 22, 25, 59].

Study Limitations and Implications

Although this study makes a significant contribution to our understanding of the educational and interpersonal

impairments associated with SP in middle adolescence, study limitations should be considered. First, the study relied on adolescent self-report for the assessment of SP, depression, and impairment. Second, we did not evaluate co-occurring behaviour disorders [12], which might have helped to inform some of the findings regarding gender differences in educational attainment. Third, although the sample size was large, a notable percentage of adolescents were lost from baseline to follow-up. As a result, it is possible that the current findings underestimate the negative educational impact of SP, as the educational status of the study dropouts at T2 may have been more compromised than among those who remained in the study (given that non-attendance to classes at T1 was more common in the attrition group than among completers). Furthermore, the results may be more representative for girls than for boys given the gender difference in the attrition rate. Nevertheless, the overall the attrition rate in the present study was typical of adolescent surveys, where factors such as male gender, delivery of follow-up questionnaires by means that require extra effort (e.g., returning the survey by post), and the questionnaire length appear to influence dropout [62]. Further, our results indicated greater educational impairment in boys, and it is plausible to assume that boys lost at follow up likely would show a similar trend (i.e., greater educational impairment).

Despite these limitations, the study strengths include using a large, representative sample of adolescents, based on the total enrolment of students in all compulsory secondary schools in two major urban areas in Finland. Every effort was made to reach adolescents again after a transition to another developmental phase where the educational and social setting had changed.

The main clinical implication of the study is to evaluate and monitor SP symptoms in adolescents, especially among boys; such symptoms appear to be associated prospectively with subsequent educational and social impairments, including a significant risk of being unable to engage in close and romantic relationships. With regard to socially anxious adolescent girls, it is important to consider the quality of their relationships, which may be compromised by SP symptoms. As SP and depression interact in a different way between the genders, future research should aim to evaluate and control for comorbidity between these frequently overlapping disorders.

Summary

Longitudinal associations between self-reported social phobia (SP) and educational and interpersonal impairments among Finnish adolescents were examined in a large population sample. Multivariate analyses revealed different pattern of impairments between socially anxious boys and girls. For boys, age 15 SP predicted slow academic progression, being without a close friend or not having a romantic relationship, and poor support from friends and significant others at age 17. For girls, SP at age 15 only predicted not having been involved in a romantic relationship by age 17. The results suggest that SP may have a more devastating effect on and academic functioning for boys than for girls.

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