

The longitudinal link between popularity, likeability, fear of negative evaluation and social avoidance across adolescence

Lisan A. Henricks  | Wolf-Gero Lange | Maartje Luijten | Yvonne H. M. van den Berg | Sabine E. M. J. Stoltz | Antonius H. N. Cillessen | Eni S. Becker

Behavioural Science Institute, Radboud University, Nijmegen, Netherlands

Correspondence

Lisan A. Henricks, Behavioural Science Institute, Radboud University, PO Box 9104, 6500 HE Nijmegen, Netherlands.
 Email: lisan.henricks@ru.nl

Abstract

This study investigated the longitudinal bidirectional associations between likeability, popularity, fear of negative evaluation, and social avoidance, to aid in preventing the negative consequences and persistent trajectories of low social status and heightened social anxiety. In total, 1741 adolescents in grades 7–9 participated at 3 yearly waves. A self-report questionnaire measured fear of negative evaluation. Peer nominations assessed likeability, popularity, and social avoidance. Lower popularity predicted more avoidance, and vice versa. More avoidance was related to lower likeability over time. Being less popular and/or more liked by peers, increased fear of negative evaluation. Support for a transactional model between social anxiety and social status was found, but distinguishing different social status and social anxiety components is necessary.

KEYWORDS

adolescence, social anxiety, social status

INTRODUCTION

Feelings of social anxiety increase during adolescence (Mancini et al., 2005), and social anxiety disorder (SAD; American Psychiatric Association, 2013; Wong et al., 2014) is one of the most common psychological disorders among adolescents (Jefferies & Ungar, 2020; Mesa et al., 2011). Fear of negative evaluation is the core fear of social anxiety, and individuals with social anxiety also show behavioral symptoms, such as fear-driven social avoidance (American Psychiatric Association, 2013).¹ Not only does social anxiety play a central role in adolescence, around the same developmental time, youth become more aware of social hierarchies and strive to obtain and maintain a high social status among peers (LaFontana & Cillessen, 2010; Pellegrini & Long, 2002). Social status can be divided into several components with two of them being likeability, indicating how much an

adolescent is liked by their peers; and popularity, indicating how dominant or socially visible an adolescent is within the peer group (Van den Berg et al., 2020). Heightened social anxiety symptoms and low status can have detrimental consequences, such as victimization, feelings of loneliness, and depressive symptoms (de Bruyn et al., 2010; Erath et al., 2007; Kraines et al., 2019; Maes et al., 2019; Siegel et al., 2009; Storch et al., 2005). In addition, both social status and social anxiety follow a chronic and unremitting course through adolescence (Hudson et al., 2015; Lu Jiang & Cillessen, 2005; Marks et al., 2012). The current study aims to obtain a better understanding of the development and maintenance of social anxiety and social status. This could aid in preventing the negative consequences and persistent trajectories of low social status and heightened social anxiety.

The transactional model posits that social status and social anxiety are bidirectionally related to each other during adolescence. They operate in a cyclic process, continuously influencing each other in both directions. However, several studies have demonstrated one direction of the relationship (social status predicting social anxiety symptoms, or vice versa; e.g., Biggs et al., 2010; Van Zalk et al., 2011), there is only one longitudinal study examining both directions

¹In the current study, social avoidance is assessed by asking peers who of their classmates does not say much or sits often alone. Although avoidance is related to social anxiety (Blöte et al., 2019), this item does not ask directly whether the social avoidance behavior is fear-driven. Therefore, throughout the rest of the manuscript, we refer to fear of negative evaluation and social avoidance as 'social anxiety related constructs' instead of 'social anxiety symptoms'.

of the relationship in one model (Henricks et al., 2021). Furthermore, social status and social anxiety are broad concepts, which can be subdivided into specific components and symptom types. Although research into social status distinguishes between popularity and likeability (e.g., Biggs et al., 2010; de Bruyn et al., 2010; Marks et al., 2012), social anxiety in relation to social status is often examined as an uniform construct (e.g., Biggs et al., 2010; van Zalk, van Zalk, Kerr, & Stattin, 2011). At the same time, there are almost no studies investigating all four constructs in one study (except Henricks et al., 2021). This may have resulted in an unclear or distorted picture of the link between social status and social anxiety. To overcome these limitations, the current study examines the longitudinal transactional relationship between popularity, likeability, fear of negative evaluation, and social avoidance during three yearly waves in adolescence.

THEORETICAL FRAMEWORKS OF SOCIAL ANXIETY AND SOCIAL STATUS

Different theories regarding the association between social anxiety and social status as general constructs exist. On the one hand, the interpersonal risk model states that a low social status may cause heightened social anxiety symptoms as problematic peer relationships are stressful (Kochel et al., 2012; Sentse et al., 2017). Contrary, the symptoms-driven model argues that socially anxious individuals may cause peer problems themselves due to their social deficits, self-selection of maladaptive friendships, or their behavior, making them easy targets for victimization (Kochel et al., 2012). The transactional model combines both of these frameworks and suggests that social status and social anxiety are bidirectionally related and perpetuate each other (Kochel et al., 2012; Parker et al., 2005). Support for the transactional model has indirectly been found as different studies found empirical evidence for both the interpersonal risk as well as the symptoms-driven model. For instance, adolescents from low-status crowds were found to experience an increase in social anxiety symptoms over time (van Zalk, van Zalk, & Kerr, 2011). Moreover, retrospective results showed that individuals with low likeability status in childhood were at considerably higher risk of an anxiety diagnosis 30 years later (Modin et al., 2011). At the same time, higher degree of social anxiety in adolescence predicted being less accepted by peers 5 months later, an indication of low social status (Biggs et al., 2010).

SUBCOMPONENTS OF SOCIAL ANXIETY AND SOCIAL STATUS

The subcomponents of social status are quite distinct. There is only a low to moderate association between popularity and likeability with popular adolescents not being necessarily

liked, and well-liked adolescents not automatically being popular (Van den Berg et al., 2020). Popularity and likeability also differentially relate to other behavioral constructs, suggesting that they are distinct. While popularity is positively associated with aggression, the association with aggression is negative for likeability (Cillessen & Marks, 2011). Similar to social status, social anxiety consists of different subcomponents: fear of negative evaluation and social avoidance. If individuals report increased fear during social interactions, this is not always observed in their behavior (Cartwright-Hatton et al., 2005). At the same time, the different subcomponents may be differentially related to other constructs, suggesting that they are distinct from each other. For instance, while fear of negative evaluation is more related to depression and general anxiety (Inderbitzen-Nolan & Walters, 2000), social avoidance is more strongly related to poor friendship quality and friendship competency (La Greca & Lopez, 1998).

There are reasons to believe that the strength of the longitudinal link between social status and social anxiety varies for the two specific subcomponents of social status. For instance, research suggests that social anxiety is more strongly related to popularity than to likeability, as socially anxious individuals are particularly experiencing problems with popularity-related aspects such as dominance, hierarchies, and social ranking (Aderka et al., 2009; Gilbert & Trower, 2001). Moreover, socially anxious individuals often try to appease others and show social desirable behavior and may thus not necessarily be less liked (Catarino et al., 2014; Gilbert, 2014). Indeed, a study by Dijk et al. (2018) showed that social anxiety symptoms were negatively associated with popularity but not with likeability. Similarly, being unpopular may be more socially threatening as it more strongly relates to victimization, loneliness, and having fewer friends, than being disliked (Hopmeyer Gorman et al., 2011).

The strength of the associations between social status and social anxiety may also vary for specific symptoms of social anxiety. Social avoidance might impact one's social status in a more profound way than social anxiety cognitions: behavior is observable to peers and thoughts are not. When individuals tend to repeatedly avoid social situations, socialization opportunities become limited, which can lead to social skills deficits in the long run (Greco & Morris, 2005). Subsequently, others may judge withdrawn adolescents more negatively, resulting in a lower social status. Research supports this notion as less popular and less liked adolescents showed higher levels of social avoidance (Pouwels et al., 2016). In addition, socially anxious individuals with behavioral deficits including social avoidance, more often experience peer difficulties, such as victimization and low peer acceptance, while individuals who only suffer from socially anxious cognitions do not (Flanagan et al., 2008).

Given the different dimensions of social anxiety and social status and their potential transactional relationship over time, it is important to distinguish between the specific dimensions in order to obtain a detailed understanding of the link of social status and social anxiety

in a longitudinal design. Although the studies described above already focused on subcomponents of social status or social anxiety (Dijk et al., 2018; Flanagan et al., 2008; Hopmeyer Gorman et al., 2011; Pouwels et al., 2016), longitudinal studies investigating both directions of all of these four components simultaneously and systematically during adolescence are lacking. Up until now there is only one recent publication by Henricks et al. (2021) investigating this. This study showed that different social anxiety symptom types were indeed differentially related to social status dimensions. Specifically, more social avoidance and distress was related to lower popularity and likeability, while higher fear of negative evaluation was not. The associations with social avoidance and distress were stronger for popularity than likeability. Longitudinal results of this study also showed that girls seen as less popular by their peers experienced more social avoidance and distress 6 months later, supporting the idea that especially popularity and social avoidance are linked.

Although the study by Henricks et al. (2021) was the first to empirically support the notion that different symptoms of social anxiety are uniquely and distinctively associated with the two dimensions of social status, there are two major limitations to this study. First, the associations between social status and social anxiety were examined within the same school year and within a relatively short interval of 6 months. This is especially problematic as both dimensions of social status are known to be highly stable within a school year (Lu Jiang & Cillessen, 2005; Rose et al., 2004), and so are levels of social fears (Ronchi et al., 2020; Tillfors et al., 2012). Social anxiety symptoms and social status are however less stable, when a 1 year interval is used (Lu Jiang & Cillessen, 2005; Ronchi et al., 2020). In the current study, we therefore expanded the developmental period under investigation by including three measurement waves with yearly intervals. As such, we are able to examine how social anxiety symptoms and social status are interrelated from early to mid-adolescence.

A second limitation of the previous study was the operationalization of the social anxiety symptoms. Specifically, the study used one self-report questionnaire to assess cognitive and behavioral symptoms of social anxiety. However, the measure of behavioral symptoms has appeared to be less appropriate in retrospect as it did not only tap into the social avoidance (i.e., the behavioral component of social anxiety) but also the experienced stress during social situations, which entails more the cognitive and emotional side of social anxiety. Moreover, research showed that socially anxious adolescents may have a biased perception of their own behavior and have the tendency to overestimate the frequency and severity of their social avoidance (Cartwright-Hatton et al., 2005; Miers et al., 2009). Using a self-report measure of social avoidance may thus result in overestimated levels. We will, therefore, use peer-reports for social avoidance and self-reports for fear of negative evaluation to get a reliable and valid estimation of the different components of social anxiety.

GENDER DIFFERENCES

The relationship between social status and social anxiety-related constructs may be different for boys and girls. However, results on gender differences so far have been inconsistent. Two studies showed that the association between peer relations and social anxiety in early adolescence is stronger for boys (Flanagan et al., 2008; Storch et al., 2005). Contrary, other studies showed that social anxiety was more strongly linked to social functioning with peers in girls (La Greca & Lopez, 1998), and retrospective associations between a low likeability status and social anxiety diagnosis were merely found for women (Modin et al., 2011). There is also a study showing no gender differences between social status and social anxiety in adolescents (La Greca & Harrison, 2005). One other study found that social status is associated with social anxiety in boys and girls, but that the association differs for the two subcomponents of social status. More specifically, while popularity predicted social anxiety symptoms in boys, social anxiety in girls was predicted by their likeability status (Sandstrom & Cillessen, 2006). Finally, the previous study looking at the longitudinal associations between different subcomponents of social status and social status symptoms found that social avoidance and distress could predict popularity status only in girls (Henricks et al., 2021). Based upon these mixed findings, the current study further explores gender differences when examining the longitudinal associations between popularity, likeability, fear of negative evaluation, and social avoidance.

CURRENT STUDY

To summarize, social status and social anxiety are assumed to be bidirectionally related to each other over time, but these associations may vary depending on the subcomponents under investigation. The aim of the current study was to examine the possibility of a bidirectional predictive relationship between social status (likeability and popularity) and social anxiety-related constructs (fear of negative evaluation and social avoidance) during three yearly waves in adolescence. By doing so, this study could aid in preventing the negative consequences and persistent trajectories of low social status and heightened social anxiety. We expected social status and social anxiety-related constructs to be reciprocally and negatively related to each other, yet that the strength of these associations would vary for the specific components of both status and anxiety. Specifically, we expected that lower popularity would more strongly predict higher social anxiety-related constructs, than being less liked. Vice versa, higher levels of social anxiety-related constructs would more strongly predict lower popularity than a lower likeability status. The longitudinal predictions with lower popularity and likeability status would be more apparent for social avoidance than for fear of negative evaluation. Finally, we will explore gender differences when examining

the longitudinal associations between social status and social anxiety-related constructs.

METHODS

Sample

The current study was part of the Kandinsky Longitudinal Study (KLS), a longitudinal study on detecting children at risk for social and emotional problems in a secondary school in the middle eastern part of the Netherlands (van den Berg et al., 2019). The ongoing study started in 2010, with yearly assessments in November/December of all students in grades 7 through 10 (i.e., the first 4 years of secondary education in the Netherlands when adolescents are approximately 12–16 years old).

For the current study, we used data of the KLS collected between 2010 and 2014, as this was the period in which data concerning our variables of interests were available. During these years, a total of 1785 adolescents participated. From these 5 years of data collection, we selected adolescents who were in grades 7–9 during these years and participated in at least one of these grades. Data from grade 10 were excluded because only a higher educated subsample participated during this grade.² This resulted in a final sample of 1741 adolescents (49.7% boys; $N_{\text{grade}7} = 1375$; $N_{\text{grade}8} = 1374$; $N_{\text{grade}9} = 1129$). In grade 7, the age of the final sample ranged between 11.09 and 14.75 years ($M = 12.68$; $SD = 0.42$). The majority of participants was born in the Netherlands (95.2%). Different educational levels were represented in the sample: prevocational (8.0%), precollege (22.9%) and preuniversity (28.7%). There were also participants with a mixed educational level (17.5% prevocational/precollege; 22.9% precollege/preuniversity).

The participants belonged to six different cohorts of students followed during their first three grades of secondary education ($n_{\text{cohort}_{2010-2012}} = 283$; $n_{\text{cohort}_{2010-2011}} = 315$; $n_{\text{cohort}_{2011-2013}} = 288$; $n_{\text{cohort}_{2012-2014}} = 303$; $n_{\text{cohort}_{2013-2014}} = 266$; $n_{\text{cohort}_{2014}} = 286$; see Table A1 in the Appendix 1). We investigated whether the correlations between fear of negative evaluation, social avoidance, likeability, and popularity were similar for the different cohorts. We used Fisher's r -to- z transformations and selected $p < .001$ as cut-off as we made many comparisons. None of the correlations between the variables within and across grades differed for the cohorts. Therefore, we decided to treat the six

²In the Netherlands there are three educational levels in secondary schools: a lower (prevocational; called VMBO), a middle (precollege; called HAVO), and a higher (preuniversity; called VWO) educational level. Depending upon which educational level adolescents are in, high school either lasts 4 years (VMBO), 5 years (HAVO), or 6 years (VWO). In the current data collection, adolescents from all three different educational levels participated in Grades 7, 8, and 9. However, adolescents from the lower educational track (VMBO), did not participate in the study in Grade 10, because they had to focus on their final exams and we did not want to distract them by any means. The sample in Grade 10 was, therefore, more selective as it only consisted of students from the middle and higher educational levels. Due to this, we decided to focus on the data of Grades 7, 8, and 9, and to exclude all data from Grade 10.

cohorts as one final sample of 1741 adolescents followed from grades 7 to 9 (irrespective of the year in which the data were collected).³

Measures

Popularity (Peer Report)

Computerized peer nomination methodology was used to measure adolescents' popularity. Participants were asked whom they considered 'most popular' and 'least popular' in their classroom. The nomination question was presented at the top, followed by the names of all classmates. Participants could nominate as many or as few classmates as they wanted, with a minimum of one. They could nominate same-sex and other-sex classmates, but self-nominations were not permitted (for psychometric properties, see van den Berg & Cillessen, 2013). The number of nominations received for each question was counted per participant and standardized within classrooms to control for differences in classroom size. Next, the difference between most popular and least popular nominations was computed, again standardizing this composite score within classroom (Cillessen & Marks, 2011). A higher score indicated higher levels of popularity.

Likeability (Peer Report)

Following the same procedure, participants nominated classmates whom they 'liked most' and 'liked least' in their classroom. For both items, nominations received were summed per participant and standardized within classroom. Next, a difference score between most liked and least liked nominations was computed, again standardizing this composite score within classrooms (Cillessen & Marks, 2011). A higher score indicates higher levels of likeability.

Social avoidance (Peer Report)

To measure social avoidance, the same peer nomination procedure was used. The only difference was that participants were also able to nominate none of their classmates for this question. Participants were asked who best fitted the description "Who of your classmates does not say much or sits often alone?". Again, the number of received nominations

³We also tested whether there were significant cohort differences in our longitudinal model by using multiple group comparisons in Mplus. Only cohorts 1, 3, and 4 could be compared, as these cohorts participated in all three grades. A fully constrained and unconstrained model were tested. Results showed that there were no significant or substantial differences in model fit of these two models. We, therefore, concluded that the longitudinal model was similar for these three cohorts (the model fit and comparison statistics are presented in Table B1 in the Appendix 1).

was computed and standardized within classroom. A higher score indicated more social avoidance.

Fear of negative evaluation (Self-Report)

The Dutch translation of the Brief Fear of Negative Evaluation Scale (Brief-FNE; Leary, 1983) was administered to measure individuals' levels of fear of negative evaluation. This questionnaire consists of 12 items, example items are: "I am worried about what others might think of me, even though I know it does not matter" and "I am afraid that others will disapprove me". Participants had to indicate how much each item describes themselves, on a 7-point Likert scale ranging from "not at all" to "very much." Typically the Brief Fear of Negative Evaluation Scale (Brief-FNE; Leary, 1983) consists of a 5-point Likert scale. However, to ensure consistency between the scales of all measures in the longitudinal study, the scale was transformed to a 7-point Likert scale. The upper and lower end anchors of the scale remained the same. The Brief-FNE was found to be a valid and reliable instrument (Collins et al., 2005; Rodebaugh et al., 2004). In our study, the internal consistency of the questionnaire was good at all grades, with Cronbach's α ranging from .87 to .89 across grades (Field, 2009). After inversely recoding four of the items, a total score was computed by summing all items, with higher scores indicating higher levels of fear of negative evaluation. This total score was standardized across all participants.

All standardized scores of popularity, likeability, social avoidance, and fear of negative evaluation below -3 and above 3 were truncated to -3 and 3 , respectively (0.85% of scores; Tabachnick & Fidell, 2007).

Procedure

Each year, the school formally requested the research and agreed to be responsible for the parental consent procedure. The school requested passive parental permission at the beginning of the school year. Adolescents were asked to give assent at the start of each assessment. This study has been approved by the Ethics Committee of ... (Faculty and University name are masked for blinded review purposes). Data collection took place at school. Adolescents completed the assessment individually on a netbook computer during a 45–60-minute classroom session. All desks were placed in a test setup, with some distance between them. Partitioning screens were placed at each desk to ensure confidential responding. Prior to assessment, the researchers explained the goal and set up of study. They remained present during assessment to answer questions. Different instruments were administered, including self-report questionnaires and sociometric assessment procedures. Written and audio instructions were provided at the beginning of each individual measure. At the end, all participants received a small thank you present.

RESULTS

Preliminary steps: missing data, assumption testing, and variable distribution

In the final sample of 1741 participants, there were 43 adolescents who repeated a grade in grade 7, 8, or 9. For these adolescents, we removed the data from the duplicate grade onwards. Moreover, 27.3% of the data was missing, either because participants were not present during an entire grade or because they did not finish all measures in time. Data were missing completely at random, since Little's MCAR test showed that the normed χ^2 ratio was 1.40 (i.e., < 3 ; Ulman, 2013). All missing data for the aggregated variables popularity, likeability, fear of negative evaluation and social avoidance are automatically handled using the Full Information Maximum Likelihood (FIML) option in Mplus version 8.6. For the sociometric data, for children who did not participate in a given wave, FIML handled missing scores for popularity, likeability, and social avoidance which represent the opinion of peers regarding the missing child. We used the FIML procedure as it is less biased and more efficient compared to other missing data techniques (Peters & Enders, 2002). Previous studies used the same technique to handle missing data for peer nominations (e.g., Park et al., 2022). For data processing and analyses, all data were grouped by grade instead of by yearly wave.

First of all, we conducted some preliminary analyses to test the assumptions for multiple regression analyses, and to explore the distribution of our variables. Assumptions were tested for popularity, likeability, fear of negative evaluation and social avoidance as outcome variables. No significant outliers nor influential cases were found (Cook's distances < 1). Observations were independent from each other (Durbin–Watson test ranged between 1.5 and 2.5). There were no issues with multicollinearity (tolerance $> .01$ and VIF < 10). For popularity, likeability, and fear of negative evaluation, the assumptions of homoscedasticity and normality of residuals were met, but these assumptions were violated for social avoidance. To handle these violations, the maximum likelihood estimation with robust standard errors (MLR estimator) was used in Mplus. Descriptive statistics of all variables in grades 7, 8, and 9 are shown in Table 1.

Correlational analyses: comparing the strength of the associations between popularity, likeability, fear of negative evaluation and social avoidance

Second, we used Pearson's correlation analyses to investigate how the variables were related to each other. We found moderate to high stability of likeability, popularity, fear of negative evaluation, and social avoidance across grades. Popularity and likeability were weakly to moderately correlated within and across all grades. Fear of negative evaluation and social avoidance were positively but only weakly

correlated to each other within and across grades 8 and 9. They were not significantly correlated within grade 7 or from grade 7 to 8 or 9. Social avoidance correlated negatively and moderately to strong with popularity and likeability, both within and across grades. Fear of negative evaluation was significantly but weakly related to popularity within all grades and across most of the grades. Fear of negative evaluation was in general not related to likeability, with the exception of the positive but weak correlation between likeability in grade 8 and fear of negative evaluation in grade 9. The correlations between all variables at all grades are presented in Table 2.

We also examined the strength of the correlations with Fisher's *r*-to-*z* transformations and Steiger's equations with a two-tailed test (Lee & Preacher, 2013). We used this procedure to examine whether (1) the correlations with the social status components were stronger for social avoidance than for fear of negative evaluation, and (2) the correlations with social avoidance and fear of negative evaluation were stronger for popularity than for likeability. We only made comparisons when at least one correlation was significant. In general, results showed that the correlations between popularity and social avoidance, and between popularity and fear of negative evaluation were significantly stronger than the correlations between likeability and fear of negative evaluation and social avoidance (*z*-scores range between -3.70 and -13.73, *p*'s < .05 across grades). There was one exception: the link between FNE and social status was not different for popularity and likeability in grade 7, although the correlations showed a similar trend. At the same time, the correlations between social status components and social avoidance were significantly stronger than the correlations between popularity and fear of negative evaluation, and between likeability and fear of negative evaluation (*z*-scores range between -10.63 and -20.36, *p*'s < .001 across grades). Table C1 in the Appendix 1 presents all details about the comparisons of the correlations.

Longitudinal analyses: examining the predictive associations between popularity, likeability, fear of negative evaluation, and social avoidance

Model construction

Cross-lagged panel models were conducted in Mplus version 8.6 (Muthén & Muthén, 1998–2017) to examine the longitudinal relations between social status components and fear of negative evaluation and social avoidance, and test for gender differences in these relations. As the assumptions of homoscedasticity and normality of residuals were violated for social avoidance, we used the maximum likelihood estimation with robust standard errors (MLR estimator). Missing data were automatically handled using Full Information Maximum Likelihood (FIML). Several longitudinal models were tested. A nonsignificant chi-square test, *p* > .05, indicated a good model fit, as well as

TABLE 1 Means and standard deviations of popularity, likeability, fear of negative evaluation, and social avoidance per grade.

	Grade 7					Grade 8					Grade 9				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
Raw nominations															
Least Popular	1375	3.37	5.42	0.00	27.00	1374	3.72	5.69	0.00	26.00	1129	3.24	5.00	0.00	25.00
Most Popular	1375	3.68	5.23	0.00	25.00	1374	4.10	5.73	0.00	26.00	1129	3.98	5.16	0.00	21.00
Least Liked	1375	1.99	2.84	0.00	20.00	1374	1.91	2.77	0.00	21.00	1129	1.80	2.54	0.00	17.00
Most Liked	1375	3.59	2.16	0.00	13.00	1374	3.75	2.20	0.00	12.00	1129	4.42	2.50	0.00	15.00
Socially Avoidant	1375	1.93	4.38	0.00	28.00	1373	2.15	4.53	0.00	25.00	1129	2.03	4.02	0.00	28.00
Main variables															
Popularity ^z	1375	-0.00	0.98	-3.31	3.08	1374	-0.00	0.98	-3.07	2.64	1129	-0.01	0.98	-3.07	2.47
Likeability ^z	1375	-0.00	0.98	-4.03	2.46	1374	0.01	0.98	-3.92	2.31	1129	-0.00	0.97	-4.18	2.48
Social Avoidance ^z	1375	0.00	0.98	-0.77	5.15	1373	-0.01	0.96	-0.88	4.94	1129	-0.00	0.97	-0.88	5.08
FNE	1193	41.15	10.95	12.00	72.00	1308	41.44	11.13	12.00	72.00	1060	41.94	10.86	12.00	72.00

Note: ^z, standardized variable. Sample size differs per variable and per grade due to missing data.

TABLE 2 Pearson's correlations between fear of negative evaluation, social avoidance, likeability, and popularity for grade 7, grade 8, grade 9, and across waves (gray) including autocorrelations.

	Grade 7				Grade 8				Grade 9			
	1	2	3	4	1	2	3	4	1	2	3	4
Grade 7												
1. FNE	--	.05	-.01	-.07*	.61***	.05	-.01	-.07*	.56***	.03	-.01	-.07
2. Avoidance	--	--	-.41***	-.70***	.05	.76***	-.26***	-.62***	-.00	.60***	-.29***	-.55***
3. Likeability	--	--	--	.42***	.01	-.35***	.57***	.35***	.02	-.31***	.46***	.30***
4. Popularity	--	--	--	--	-.03	-.62***	.21***	.84***	-.05	-.53***	.29***	.72***
Grade 8												
1. FNE	--	.11***	.03	-.09**	--	.66***	.04	-.08**				
2. Avoidance	--	--	-.35***	-.70***	.07*	.64***	-.33***	-.55***				
3. Likeability	--	--	--	.25***	.07*	-.23***	.53***	.19***				
4. Popularity	--	--	--	--	-.10**	-.55***	.29***	.78***				
Grade 9												
1. FNE	--	.09**	.06	-.10**	--							
2. Avoidance	--	--	-.39***	-.70***	--							
3. Likeability	--	--	--	.37***	--							
4. Popularity	--	--	--	--	--							

Note: Sample size differs per variable and for each correlation due to missing data. * $p < .05$; ** $p < .01$; *** $p < .001$.

Abbreviation: FNE, fear of negative evaluation.

TABLE 3 Model fit indices and model comparisons of models 1–3 ($N = 1741$).

Models	χ^2	df	p	CFI	RMSEA	SRMR	AIC
Model 1: Theoretical model	149.63	24	<.001	0.978	.055	.033	33668.238
Model 1a: Model 1 + Modification ^a	102.44	23	<.001	0.986	.045	.028	33616.059
Model 1b: Model 1a + Modification ^b	75.51	22	<.001	0.991	.037	.022	33587.644
Model 1c: Model 1b + Modification ^c	55.91	21	<.001	0.992	.035	.022	33568.057
Model 1d: Model 1c + Modification ^{d,*}	30.40	20	.064	0.998	.017	.014	33539.105
Model 2: Model 1d Fully unconstrained	60.54	40	.020	0.996	.024	.020	33169.853
Model 3: Model 1d Fully constrained	115.93	86	.017	0.995	.020	.042	33150.717
Comparisons	SB χ^2	Δdf	p	ΔCFI	$\Delta RMSEA$	$\Delta SRMR$	ΔAIC
Model 1 – Model 1a	41.80	1	<.001	–0.008	.010	.005	52.179
Model 1a – Model 1b	26.40	1	<.001	–0.005	.008	.006	28.415
Model 1b – Model 1c	22.57	1	<.001	–0.001	.002	.000	19.587
Model 1c – Model 1d	12.46	1	<.001	–0.006	.018	.008	28.952
Model 1 – Model 1d	93.14	4	<.001	–0.020	.038	.019	129.133
Model 1d – Model 2	30.14	20	.068	0.002	–.007	–.006	369.252
Model 1d – Model 3	85.96	66	.050	–0.003	–.003	.028	388.388
Model 2 – Model 3	56.59	46	.136	0.001	.004	–.022	19.136

Abbreviations: AIC, Akaike Information Criterion; CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual.

^a= Autoregressive path from fear of negative evaluation grade 7 to grade 9 is added.

^b= Autoregressive path from popularity grade 7 to grade 9 is added.

^c= Autoregressive path from likeability grade 7 to grade 9 is added.

^d= Autoregressive path from social avoidance grade 7 to grade 9 is added.

*= Final model.

CFI > .95, RMSEA < .06, SRMR < .08, (Hu & Bentler, 1999), and lower Akaike information criterion (AIC) values. If the model fit was not appropriate, modification indices above 10 which made theoretically sense (Muthén & Muthén, 2017) were considered.⁴ Significant change in model fit between the models was tested using the Satorra–Bentler scaled chi-square difference test (Satorra & Bentler, 2010). The difference between models was evaluated as substantial if $\Delta CFI \geq -.010$, $\Delta RMSEA \geq .015$, and $\Delta SRMR \geq .010$ (Chen, 2007). All model fit and comparison statistics are presented in Table 3.

Model 1 was our theoretical model and examined the bidirectionality between popularity, likeability, fear of negative evaluation, and social avoidance over time. Stability paths for all variables were estimated from grade 7 to 8, and from grade 8 to 9. Cross-lagged paths from social status components at grades 7 and 8 to fear of negative evaluation and social avoidance at grades 8 and 9, respectively, were included, as well as the opposite cross-lagged paths (from

fear of negative evaluation and social avoidance to social status components). Within-grade correlations between all variables were controlled for. Model 1 was estimated for the total sample. The model fit statistics were inconsistent: CFI, RMSEA and SRMR indicated good model fit, while chi-square did not. Modification indices suggested to include the autoregressive parameters of the variables from grade 7 to grade 9, indicating high stability of the variables over time. We added these paths using a stepwise procedure (beginning with the path with the highest modification index). Specifically, Model 1a included the autoregressive path for fear of negative evaluation; Model 1b for fear of negative evaluation and likeability; Model 1c for fear of negative evaluation, likeability, and popularity; and Model 1d for fear of negative evaluation, likeability, popularity, and social avoidance. Models 1a to 1c had a good model fit according to all fit indices, except the chi-square test. The model fit of Model 1d was good according to all indices, including the chi-square test. Adding the extra paths significantly increased the model fit each time. The model fit of Model 1d was significantly and substantially better than the original Model 1. Hence, Model 1d functioned as our final theoretical model.

⁴The modification index is the χ^2 value, with 1 degree of freedom, by which model fit would improve if a particular path was added or constraint freed. In other words, the modification indices indicate which paths in the model should be added or constraint to result in a better model fit.

Gender differences in the longitudinal model

We used the procedure of multiple group comparisons to examine whether there exist gender differences in our longitudinal model. All these models were based upon Model 1d. Model 2 was a fully unconstrained model, in which all parameters were freely estimated across genders. Model 3 was a fully constrained model, in which all parameters were constrained to be equal across genders. The model fit of both models was appropriate according to most fit indices, but not according to the chi-square index. The model fit of Models 2 and 3 did not significantly or substantially differ from each other, nor did they differ from the model fit of Model 1, our theoretical model. These results indicated that the theoretical model does similarly apply to boys and girls, thus that certain gender differences do not exist. The most parsimonious model, which is the theoretical model, Model 1, was therefore chosen as the final model.

Final model

Figure 1 shows an overview of all longitudinal paths of the final model, Model 1. All autoregressive paths were positive and significant. Effect sizes ranged from moderate to strong. Higher levels of likeability, popularity, fear of negative evaluation, and social avoidance at a certain grade predicted higher levels of these variables at a later grade. These results indicate stability of social anxiety-related constructs and social status across adolescence. The autoregressions were

strongest from grade 7 to grade 8, and lowest from grade 7 to grade 9.

Regarding the cross-lagged effects, popularity in grades 7 and 8 negatively predicted social avoidance 1 year later. Lower popularity ratings by peers thus increased the risk of showing social avoidance over time. The opposite direction was also found, where more social avoidance at grade 7 predicted lower popularity levels at grade 8. Social avoidance at grade 8 negatively predicted likeability at grade 9. More social avoidance thus resulted in being less liked by peers. The effects from popularity and likeability at grade 8 to fear of negative evaluation at grade 9 were in opposite directions. Specifically, this effect was negative for popularity, meaning that being less popular resulted in more fear of negative evaluation over time. Contrary, for likeability this effect was positive, indicating that being more liked predicted more social anxious cognitions. All significant cross-lagged paths were weak in size. All other cross-lagged paths were nonsignificant.

DISCUSSION

This study aimed to examine the bidirectional longitudinal links between social status components and social anxiety-related constructs during three yearly waves in adolescence. The current study was one of the first longitudinal studies focusing on both directions of the relationship in one model and subdividing social status and social anxiety into specific components (i.e., popularity and likeability) and symptom types (fear of negative evaluation and social avoidance).

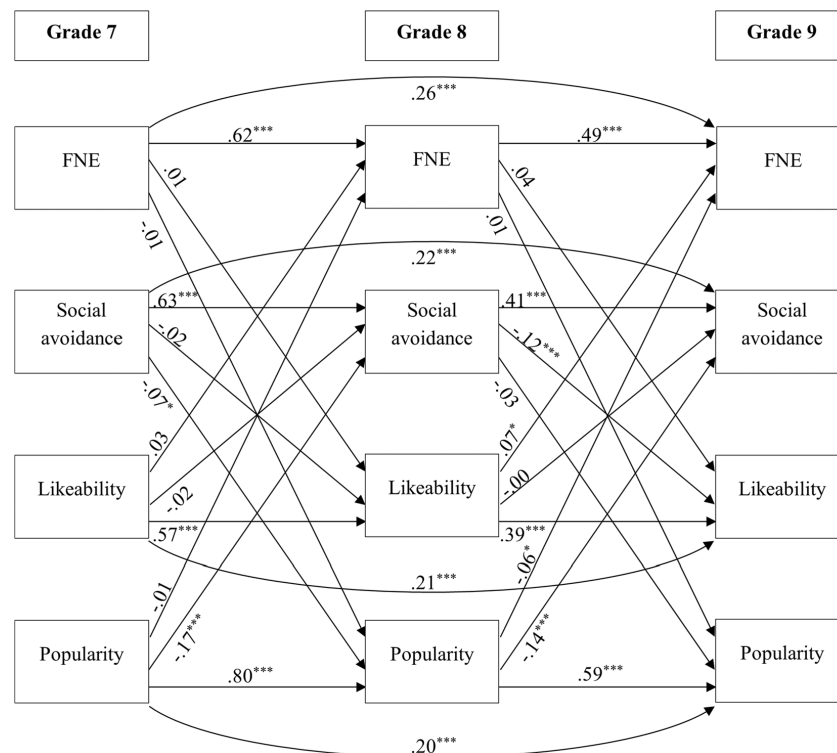


FIGURE 1 Representation of Longitudinal Standardized Estimates of the Final Model (Model 1d). For clarity of presentation, concurrent correlations between the variables are not presented. * $p < .05$; ** $p < .01$; *** $p < .001$.

Gender differences in all associations were explored. Obtaining a better understanding of the development and maintenance of these subcomponents could aid in preventing the negative consequences and persistent trajectories of low social status and heightened social anxiety. In general, we found evidence for negative reciprocity between social status and social anxiety-related constructs during adolescence as assumed by the transactional model. However, this bidirectional relationship was largely dependent upon the specific components of social status (popularity vs. likeability) and social anxiety-related constructs (fear of negative evaluation vs. social avoidance) under investigation.

THE LINK BETWEEN POPULARITY, LIKEABILITY, FEAR OF NEGATIVE EVALUATION, AND SOCIAL AVOIDANCE

We found a negative bidirectional relationship between popularity and social avoidance from grade 7 to 8 (e.g., the first 2 years of secondary education). Showing more social avoidance increased the risk of becoming less popular among peers over time, probably because avoidance eventually limits socialization opportunities and may cause social skills deficits in the long run (Greco & Morris, 2005). At the same time, lower popularity among classmates was related to an increased risk of social avoidance from the peer group. Social avoidance may serve as a safety strategy for less popular adolescents, in order to avoid the risk to be actively excluded from the peer group or to become victimized (Zimmer-Gembeck et al., 2014). From grade 8 to 9 only one direction of the relationship between popularity and social avoidance was found, specifically from popularity in grade 8 to social avoidance in grade 9.

Social avoidance was not only longitudinally related to lower popularity but also to lower likeability. More social avoidance in grade 8 predicted lower likeability ratings by their peers in grade 9. This finding was consistent with work by Biggs et al. (2010) showing that higher social anxiety symptoms in adolescence predicted being less accepted by peers 5 months later. These results suggest that social anxiety-related constructs might negatively affect individuals' social status in the group due to, for instance, inappropriate social skills or self-selection of maladaptive friendships (Kochel et al., 2012).

We also found evidence for a longitudinal link between the social status components and fear of negative evaluation. Popularity and likeability in grade 8 predicted fear of negative evaluation in grade 9. Strikingly, the direction of these effects was opposite for popularity and likeability. Individuals had a higher risk of experiencing more fear of negative evaluation over time not only when being seen as less popular but also when being more liked. The result that lower popularity was related to increased fear of negative evaluation was in line with our expectations and could be explained by the fact that problematic peer relationships such as low popularity are stressful (Kochel et al., 2012;

Sentse et al., 2017). Contrary, the finding that being less liked also predicted an increase in fear of negative evaluation was surprising, but seemed in hindsight plausible. Higher liked adolescents are maybe more concerned by maintaining their likeability status, predicting increased social fear. In addition, scholars suggest that being afraid to be negatively evaluated by others is part of the profile of highly liked individuals. These individuals show more prosocial behavior and compliance to others, which might make them more liked by peers (Leary, 1983).

Overall, our results were largely in line with the conclusions of the previous study by Henricks et al. (2021). However, a major difference is that in the previous study, only support for the interpersonal risk model was found. Less popular girls increased in social avoidance and distress over time. In the current study more longitudinal relationships were found in line with the transactional model. The discrepancy in findings could be due to a difference in the operationalization and measure of behavioral social anxiety constructs, or because of the use of a larger time interval (Keijsers & Van Roekel, 2018).

STRONGER LINKS BETWEEN SEVERAL SUBCOMPONENTS OF SOCIAL STATUS AND SOCIAL ANXIETY-RELATED CONSTRUCTS

Our cross-sectional results suggested that likeability and popularity were more strongly related to social avoidance than to fear of negative evaluation, which was in line with previous research (Flanagan et al., 2008; Henricks et al., 2021). This finding could be explained by the fact that social avoidance is observable for peers, while fear of negative evaluation is not. Social avoidance may also have more impact on social status, as it may lead to limited socialization with peers and precipitates social skills deficits (Greco & Morris, 2005). Of course, it could be questioned whether our findings are caused by the use of different informants to measure the variables (De los Reyes, A. & Kazdin, A. E., 2005). Social status components and social avoidance were assessed via peer nominations, in contrast to self-reported fear of negative evaluation. It seems plausible that due to using the same informant, the link between social avoidance and social status is stronger than the association between fear of negative evaluation and social status. However, in a previous study where fear of negative evaluation and social avoidance were assessed both via self-reports, we also found a stronger link between social avoidance and the social status components (Henricks et al., 2021), providing evidence that this result is probably not simply caused by methodological reasons.

Similar to our expectations, the associations of social anxiety-related constructs with social status were also stronger for popularity than for likeability, which was also found by other studies (Dijk et al., 2018; Henricks et al., 2021). A reason for this could be that adolescents with social anxiety perceive the social context in a more hierarchical way and view relationships as more competitive than

their nonanxious counterparts. They may thus experience problems with dominance, hierarchies, and social ranking in specific (Aderka et al., 2009; Gilbert & Trower, 2001), factors which are closely related to popularity. Contrary, difficulties with likeability may be experienced to a lesser extent, as adolescents with social anxiety often appease others and show socially desirable behaviors (Catarino et al., 2014; Gilbert, 2014), which may not result in more negative likeability nominations by peers. Another argument for a stronger link with popularity than likeability could be that being unpopular is more threatening than being disliked due to its association with victimization, loneliness, and a lack of friendships (Hopmeyer Gorman et al., 2011).

GENDER DIFFERENCES

Our results suggested that the associations between social status components and social anxiety-related constructs were similar for boys and girls. This was contrary to previous studies showing stronger links for girls (Henricks et al., 2021; La Greca & Lopez, 1998; Modin et al., 2011) or boys (Flanagan et al., 2008; Storch et al., 2005), but was in line with one earlier study showing no gender differences between social status and social anxiety in adolescents (La Greca & Harrison, 2005). The lack of significant gender differences in our model could have resulted from the fact that we investigated a slightly older age group than earlier studies. Some researchers have namely argued that gender differences in general might be most pronounced during early adolescence (Petersen & Taylor, 1980) due to the fact that girls experience pubertal maturation earlier than boys (Wohlfahrt-Veje et al., 2016).

STRENGTHS, LIMITATIONS, AND FUTURE DIRECTIONS

This study adds to the existing literature by adopting a prospective study design and investigating specific components of social status and social anxiety-related constructs during adolescence. The major strengths of this study include the use of a large sample and the fact that adolescents are followed across a relatively long time span in early and mid-adolescence. Nevertheless, it should be noted that this study was not without limitations. Yet these provide interesting suggestions for future research.

First of all, we used different informants to measure the variables and this may have affected the findings (De los Reyes, A, & Kazdin, A. E., 2005). Likeability, popularity, and social avoidance were measured with peer nominations, and fear of negative evaluations with a self-report questionnaire. By using the same informant, the link between social avoidance and social status could be stronger than the association between fear of negative evaluation and social status. In future research, multiple methods and reporters ought to be considered to exclude this alternative explanation.

Second, it seems plausible that the transition from grade 7 to 8 was experienced differently for adolescents than the change from grade 8 to 9. In the specific secondary school participating in this study, the peer context remained relatively the same from grade 7 to 8 as adolescents stayed with their peers in the same class. However, after grade 8 adolescents were distributed differently over the classes based upon their chosen education level. Consequently, there is more change within classes from grade 8 to grade 9, possibly influencing the peer nomination variables as the new peer context calls for a new social hierarchy. Future research would benefit from including a secondary school in which the transitions between grades are similar (e.g., within each grade the classes are mixed) to better compare the longitudinal link between social status and social anxiety-related constructs as confounding factors such as a new peer context are then excluded.

Third, to obtain a more detailed understanding about the interplay between social status and social anxiety-related constructs, it would be interesting to examine the constructs directly after entering secondary school as social anxiety symptoms elevate after educational transitions (Grills-Taquechel et al., 2010) and this completely new peer context requires social status formation. Instead of our yearly intervals across three grades, having a measurement burst design (Sliwinski, 2008) with multiple measurement moments with short time intervals at the beginning of grade 7 would probably lead to a better investigation of the relationship between social status and social anxiety-related constructs as the concepts are examined during a critical period.

For future research it would also be interesting to explore mechanisms underlying the longitudinal association between social status and social anxiety-related constructs to understand the developmental links between the two social constructs in greater detail. Several theoretical frameworks have suggested the role of different underlying factors. For instance, the symptoms-driven model suggests that adolescents with social anxiety may have social skills deficits which evoke certain reactions by the peer group, resulting in a lower social status (Kochel et al., 2012; Sentse et al., 2017). According to the interpersonal risk model social anxiety arises because adolescents with a low social status do not experience that they belong to a group, or experience support from their peers, which interferes with their basic human needs (Kochel et al., 2012; Sentse et al., 2017). The sociometer theory (Mark R. Leary & Baumeister, 2000) and the social rank theory (Price & Sloman, 1987) have postulated the role of low self-esteem and own perceived low social status within a peer group. These internal worries and feelings of being unworthy to peers may induce social anxiety feelings and behavior, and may evoke a certain reaction by the peer group (Gilbert, 2000). Future research could concentrate on examining these potential underlying factors such as poor social skills, interference with basic human needs of belongingness and support, negative self-perceptions, and low self-esteem and thereby unraveling the complex longitudinal link between social status and social anxiety-related constructs.

CLINICAL IMPLICATIONS

Although this study focused on a community sample,⁵ social avoidance and FNE were meaningfully associated with social status, suggesting potential clinical implications. Our findings showed that there was a negative perpetuating cycle between lower popularity and more social avoidance. Avoiding social situations is a rather short-term solution, and may in fact maintain or worsen social fears (Hofmann & Hay, 2018; Wong & Rapee, 2016). This was also supported by our study, as results showed that social avoidance resulted in being less liked by peers, and that low popularity may also lead to increasing fear of negative evaluation. To prevent more severe negative consequences of low social status and heightened social anxiety in the future, such as victimization and exclusion from the peer group (de Bruyn et al., 2010; Siegel et al., 2009), it seems necessary to interrupt the negative cycle between social avoidance and popularity. Although not measured in our study, social avoidance in social anxiety is often fear-driven. It, thus, seems important to reduce the underlying fears to subsequently prevent social avoidance. One way of doing this is by teaching adaptive coping strategies including cognitive reappraisal and acceptance (Schäfer et al., 2017) to improve how adolescents handle social stressful situations. Another way of preventing social avoidance, especially for low popular adolescents, is via the use of exposure therapy. Previous research actually found that exposure in vivo is as effective as cognitive therapy and might be the most cost effective intervention for social anxiety disorder (Powers et al., 2008). Our findings also highlight the central role that exposure should play in current treatment, as especially social avoidance was related to social status, while fear of negative evaluation was less important.

CONCLUSION

The present study contributed to the current body of adolescent research by adopting a bidirectional prospective longitudinal design to investigate the associations between different aspects of social status and social anxiety-related constructs across three yearly waves in adolescence. Although the effect sizes of the bidirectional relationships were relatively small, results showed that in general there was reciprocity between social status and social anxiety-related constructs, in line with the transactional model. The associations were however different for the specific social components. A negative bidirectional relationship was found between social avoidance and popularity: lower popularity predicted more social avoidance and vice versa. Showing more social avoidance increased the risk of being seen as less liked over time. Both social status

⁵In our community sample, the mean scores on Fear of Negative Evaluation ranged between 41.15 and 41.95 across grades. A previous study looking at a clinical sample of individuals with social phobia showed a mean score of FNE of 51.5 (Collins et al., 2005).

components predicted fear of negative evaluation, but in opposite directions: being less popular or being more liked predicted elevated levels of fear of negative evaluation. No gender differences were found. In conclusion, the findings show the necessity of distinguishing between different social status components and cognitive and behavioral correlates of social anxiety in order to obtain a comprehensive understanding of these constructs.

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CONFLICT OF INTEREST STATEMENT

There was no conflict of interest in the conduct and reporting of the current study.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, L. A. Henricks, upon reasonable request.

ORCID

Lisan A. Henricks  <https://orcid.org/0000-0003-0668-1348>

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APPENDIX 1

TABLE A1 Distribution of final sample across cohorts (N = 1741).

Cohort	N	Year				
		2010	2011	2012	2013	2014
1	283	Grade 7	Grade 8	Grade 9	-	-
2	315	Grade 8	Grade 9	-	-	-
3	288	-	Grade 7	Grade 8	Grade 9	-
4	303	-	-	Grade 7	Grade 8	Grade 9
5	266	-	-	-	Grade 7	Grade 8
6	286	-	-	-	-	Grade 7
Total	1741					

Note: The total sample consisted of participants who were at least present during one grade, and for participants who duplicated a grade, the data from the duplicate grade onward were removed.

TABLE B1 Model fit indices and model comparisons of the fully constrained and unconstrained model for cohorts 1, 3, and 4 (N = 874).

Models	χ^2	df	p	CFI	RMSEA	SRMR	AIC
Model 1: Fully unconstrained	59.83	60	.482	1.000	.000	.019	21185.144
Model 2: Fully constrained	146.02	152	.622	1.000	.000	.038	21108.769
Comparisons	SB χ^2	Δdf	p	ΔCFI	$\Delta RMSEA$	$\Delta SRMR$	ΔAIC
Model 1 – Model 2	86.54	92	.641	0.000	.000	-.019	76.375

Abbreviations: AIC, Akaike Information Criterion; CFI, Comparative Fit Index; RMSEA, Root Mean Square Error of Approximation; SRMR, Standardized Root Mean Square Residual.

TABLE C1 Comparison of the strength of the correlations using Fisher's r-to-z transformations and Steiger's equations with a two-tailed test (Lee & Preacher, 2013).

		Grade 7	Grade 8	Grade 9	Conclusion
Correlation 1	Correlation 2	z	z	z	
popularity–FNE	likeability–FNE	-1.71	-3.70***	-4.55***	popularity–FNE is stronger
popularity–avoidance	likeability–avoidance	-13.13***	-13.73***	-12.23***	popularity–avoidance is stronger
avoidance–popularity	FNE–popularity	-19.68***	-20.36***	-18.12***	avoidance–popularity is stronger
avoidance–likeability	FNE–likeability	-10.63***	-10.92***	-11.45***	avoidance–likeability is stronger

Note: N is not equal for each correlation, because there are missing data for FNE, but not for the peer-nomination variables. If the N's were different, we used the smaller N in the test. * $p < .05$; ** $p < .01$; *** $p < .001$.

Abbreviation: FNE, fear of negative evaluation.