



Are Socially Anxious Children Really Less Liked, or Do They Only Think So?

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Abstract

The purpose of this study was to examine the relation of social anxiety with self-perceived and peer-reported likability, while controlling for the possible influence of depression. In total, 586 children (7 to 13 years) completed questionnaires to measure social anxiety, self-assessed likability, and depression. Peer-reported likability was derived from sociometric data on likability. As expected, children with higher self-reported social anxiety perceived themselves as less liked by classroom peers than children with lower self-reported social anxiety. In reality, children with higher levels of social anxiety were *more* liked by peers than children with lower levels of social anxiety. Multilinear regression analyses indicated no confounding effect of depression: Social anxiety, but not depression, was a significant predictor of biased perceived likability. Correcting the discrepancy between objective versus subjective likability may be a crucial target in the prevention and treatment of social anxiety disorders in children.

Keywords Social anxiety · Cognitive bias · Perception bias · Peer likability · Sociometrics

Social anxiety disorder is among the most common anxiety disorders and is marked by the persistent fear of being judged negatively in social situations (American Psychiatric Association 2003; Kessler et al. 2005). Childhood anxiety disorders, including social anxiety, do not necessarily remit with age, and if left untreated, they can persist into adolescence and adulthood. They are associated with an increased risk of later depression and substance abuse (Keller et al. 1992). Although treatments for child anxiety have shown good efficacy, they have clear limitations. On average, 40% of children continue to have a diagnosis following treatment

(James et al. 2013). In particular, the treatment of social anxiety disorder has a lower efficacy compared to other anxiety disorders (Beidel and Turner 2007; Hudson et al. 2015). Moreover, attempts to increase the effectiveness through minor variations such as group versus individual delivery, homework adherence, inclusion of parents, or targeting of parent anxiety have failed to produce marked differences in treatment outcomes (Rapee et al. 2009; Lundkvist-Houndoumadi et al. 2015; Arendt et al. 2015). In order to get a better understanding of childhood social anxiety, the current study focused on the processes underlying social anxiety in a large community sample of children varying in their levels of social anxiety.

In general, researchers agree that children with higher levels of social anxiety have concerns about their social skills (Cartwright-Hatton et al. 2003), perceive themselves as less socially competent in the interaction with peers (Spence et al. 1999), and are more afraid of being disliked by their peers (Bodden et al. 2009; La Greca and Lopez 1998; La Greca and Stone 1993) than children with lower levels of social anxiety (for a review, see Kingery et al. 2010). However, there are only very few studies that examine whether these feelings are warranted. The current study focused on answering the following question: ‘Do children with higher

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levels of social anxiety indeed have poorer social skills, competence, and likability than children with lower levels of social anxiety, or do they only have a negatively biased perception of their social skills, competence and likability?"

Although several studies focused on the social skills and competence of children with varying levels of social anxiety, including self-ratings and other-ratings (e.g., Cartwright-Hatton et al. 2003; Inderbitzen-Nolan et al. 2007), to the best of our knowledge, no published studies explicitly focused on the *difference* between the two types of ratings, and on the relation between social anxiety and likability within the classroom context. There are some studies that used self-report measures of likability and/or other-report measures of likability (e.g., peers, parents, teachers; for a review, see Kingery et al. 2010). For example, La Greca and colleagues found that children (La Greca and Stone 1993) and adolescents (La Greca and Lopez 1998) with higher levels of social anxiety reported lower perceptions of their likability than children and adolescents with lower levels of social anxiety. A few studies investigated the relation between social anxiety and peer-reported likability with various outcomes (Baker et al. 2014; Barrow et al. 2011; Bell-Dolan et al. 1995; Crick and Ladd 1993; Greco and Morris 2005; Inderbitzen et al. 1997). While some studies found a clear negative link between social anxiety and peer-liking (e.g., Baker et al. 2014; Barrow et al. 2011), other studies found mixed results (Bell-Dolan et al. 1995; Crick and Ladd 1993). For instance, Barrow et al. (2011) conducted a study in which children had to rate peers with and without a social anxiety disorder who delivered a brief speech. They found that peer-observed anxiety negatively predicted peer-liking: Children with a social anxiety disorder were less liked by peers than non-socially anxious children. Baker et al. (2014) asked children between 7 and 12 years old to give a verbal presentation in an anxious manner and in a non-anxious manner. They found that anxious actors were less liked than confident actors. Ladd and Troop-Gordon (2003) included both self-perceived likability and ratings of likability by peers, and found that higher teacher-reported internalizing problems were significantly related to lower levels of self-perceived liking and higher peer rejection. Even though these studies give some idea about the relation between social anxiety and likability, more research is needed that explicitly focuses on the difference between self-perception of likability and likability as reported by peers.

The aim of this study was to investigate the possible difference between self-perceived and peer-perceived likability and its relation to social anxiety. We formulated four hypotheses. First, we tested the relation between social anxiety and self-perceived likability. We expected that children with higher levels of social anxiety would perceive themselves as being less liked than children with lower levels of social anxiety (e.g., La Greca and Stone 1993). The second

goal was to determine the relation between social anxiety and peer-reported likability. We expected that children with higher levels of social anxiety would be less liked by peers than children with lower levels of social anxiety, since previous research suggests that socially anxious children are less liked (e.g., Baker et al. 2014; Barrow et al. 2011). The third goal was to assess the discrepancy between self-perceived and peer-perceived likability. As there are no previous studies that have looked at the difference between self-perceived and peer-perceived likability by classmates in relation to social anxiety, we did not have a definite hypothesis for this research goal. However, we could expect to find an underestimation of likability due to two different lines of research. First, previous studies in children have found a significant relation between social anxiety and a biased perception of social situations (e.g., Klein et al. 2018b; Muris et al. 2000). Second, studies in both adults and children using self-reported and objective ratings of social performance have found that individuals with higher levels of social anxiety had a stronger tendency to under-estimate the quality of their social performance, compared to objective raters (van Niekerk et al. 2017; Voncken and Bögels 2008). The fourth goal of the current study was to test the relation of social anxiety with the above-mentioned variables, while controlling for the potential confounding effect of depression. As social anxiety and depression are highly related and show a strong overlap in the genetic factors that underlie vulnerability, depression was included as a potential confounding variable (e.g., Cole et al. 1998; Luebke et al. 2010; Nivard et al. 2015; Stein et al. 2001; Strauss et al. 1984; Zimmer-Gembeck et al. 2007). To the best of our knowledge, there are no studies that specifically focused on the unique relation of social anxiety and depression and the difference between self-rated and peer-rated likability. We therefore did not have a definite hypothesis. However, we could expect that depression might be a confounding factor, due to the positive relation between social anxiety and depression.

Methods

Participants

An unselected sample of children was recruited from 11 regular elementary schools in the Netherlands. After parental active consent had been granted, a total of 688 children participated in this study. Due to incomplete data sets, the data of only 586 children (303 boys) could be used in the analyses. The relatively large number of incomplete data sets was due to the fact that 88 children did not fill out the Children's Depression Inventory (CDI) which was administered 1 week after the initial data collection. All children were between 7 and 13 years of age ($M=10.0$, $SD=1.2$).

Unfortunately, no further demographic information was obtained due to privacy regulations. The current study was part of a larger study on childhood anxiety, which was approved by the Ethical Committee of the Social Science Department of Radboud University Nijmegen, the Netherlands. The current sample partly overlapped with the samples of other studies that focused on cognitive biases related to childhood anxiety (Klein et al. 2017a, b, 2018a, b, van Niekerk et al. 2017).

Measures

Self-assessment of Likability

The participants were asked to rate the statement “My classmates like me”, using a 7-point Likert-scale (1 = not true at all, 7 = completely true). The scores were standardized to z-scores within classrooms in order to obtain a score relative to the classmates.

Peer-Assessment of Likability

Children were asked to write down the names of those children in the class which they liked least and those which they liked most. They were allowed to name a maximum of six classmates per category, and they could distribute the names across the two categories as they liked. For each child, the number of nominations received for each question was computed and then standardized within classrooms. Based on these nominations provided by peers, four sociometric continuous dimensions were computed. The *acceptance* dimension corresponds to the standardized measure of the received nominations for “most liked”. The *rejection* dimension corresponds with the standardized measure of the received nominations for “least liked”. The *impact* score is computed by adding up the “most liked” and “least liked” nominations and standardizing them within classrooms. Finally, the *preference* score is the number of “most liked” nominations minus the number of “least liked” nominations (Coie et al. 1982). *Preference* is assumed to be a general estimate of likability by peers (Cillessen and Marks 2011).

Discrepancy Score of Likability

A possible cognitive bias in perceived likability was determined by calculating the difference between peer- and self-assessed likability. The difference was determined by subtracting the standardized self-assessment score from the standardized *preference* score, yielding a discrepancy score. Higher values of this score indicate a relatively stronger underestimation of one’s likability status among peers.

Social Anxiety Scale for Children—Revised (SASC-R; La Greca and Stone 1993)

In order to measure levels of social anxiety, the SASC-R was used. The SASC-R is a self-report questionnaire consisting of 18 items. Each item is rated on a 5-point scale ranging from ‘never’ to ‘always’. Eight items of this questionnaire measure fear of negative evaluation (e.g., ‘I worry about what other children say about me’). Six other items of the SASC-R measure social avoidance and distress in new social situations, for example ‘I get nervous when I talk to kids I don’t know very well’. The other items of this questionnaire measure social avoidance and distress in general (e.g., ‘I am quiet when I’m with a group of kids’). In total, 27.7% of the children had subclinical scores, and 11.7% of the children had clinical scores on the SASC-R. A mean SASC-R score was calculated and used as a continuous variable in all analyses. The validity and reliability of the SASC-R were satisfactory (La Greca and Stone 1993). In the current sample, the internal consistency was excellent ($\alpha = .91$).

Children’s Depression Inventory (CDI; Kovacs 1978)

The CDI was used for measuring the general level of depression in the participants. This questionnaire consists of 27 items, with each item consisting of three statements about depressive symptoms, for example, ‘I feel sad all the time’, ‘I often feel sad’, ‘I sometimes feel sad’. The participants’ task is to indicate which statement fits them best. A mean CDI score was calculated and used as a continuous variable in all analyses. In total, 20.4% of the participating children had a clinical score on the CDI. The internal consistency of the original scale was shown to be good, retest reliability was shown to be moderate (e.g., Kovacs 1978). Internal consistency in this study was good ($\alpha = .84$).

Procedure

All questionnaires were completed in the regular classroom environment of the participants. In the first measurement session, the children completed the sociometric questionnaire and the likability self-assessment questionnaire, followed by the SASC-R. A week after initial testing, the participants completed the CDI.

Table 1 Descriptive statistics of the likeability measures, social anxiety, and depression

	Mean (SD)	Range
Self-assessment of likability	5.41 (1.28)	[1.00; 7.00]
Peer-assessment of likability:		
Acceptance	3.00 (2.11)	[0.00; 10.00]
Rejection	1.62 (2.21)	[0.00; 12.00]
Impact	4.62 (2.64)	[0.00; 13.00]
Preference	1.37 (3.42)	[-12.00; 10.00]
Discrepancy score of likability	0.01 (1.15)	[-3.31; 4.49]
Social anxiety score	2.12 (0.66)	[1.00; 4.39]
Depression score	0.32 (0.24)	[0.00; 1.33]

Results

Descriptives

Descriptive statistics are presented in Table 1. Pearson correlations showed a significant positive medium-to-large correlation between social anxiety and depression, $r = .46$, $p < .001$.

Self-assessment of Likability

In order to test the relation between social anxiety and self-perceived likability (Goal 1), we computed a Pearson correlation. As expected, social anxiety was significantly and negatively related to self-perceived likability: Children with higher levels of social anxiety perceived themselves as being less liked by classmates than children with lower levels of social anxiety, $r = -.27$, $p < .001$.

In order to control for the possible confounding effect of depression (Goal 4), we conducted a multiple linear

regression analysis with social anxiety and depression as predictors, and the average self-assessment score of likability as the dependent variable (see Table 2). This regression analysis allows for an estimation of the independent contributions of social anxiety and depression to the prediction. The Variance Inflation Factor (VIF) was calculated to test the level of collinearity between social anxiety and depression, indicating no collinearity ($VIF = 1.00$). The model containing both predictors was significant, $F(2,604) = 48.63$, $p < .001$, $R^2 = .14$. Thus, both social anxiety and depression contributed independently of each other to the prediction of self-perceived likability, such that higher social anxiety scores and higher depression scores predicted lower self-perceived likability, $\beta = -.21$, $p < .001$, and $\beta = -.24$, $p < .001$, respectively (see Table 2).

Peer-Assessment of Likability

In order to test the relation between social anxiety and peer-reported likability (Goal 2), we again computed Pearson correlations. Unexpectedly, none of the peer-assessment scores was significantly related to social anxiety (acceptance: $r = -.04$, rejection: $r = -.03$, preference: $r = .01$, impact: $r = -.06$, all $p > .05$).

Subsequently, in order to control for the possible confounding effect of depression (Goal 4), we conducted four multiple linear regression analyses with social anxiety and depression as predictors, and the four peer-assessment scores as dependent variables (see Table 2). The regression model with *acceptance* as the predicted variable was significant, $F(2,594) = 6.00$, $p = .003$, $R^2 = .02$, but there was only a significant prediction by depression, and not by social anxiety: The higher the level of depression (controlling for social anxiety), the less often a child was named as “most liked”. The regression model with *rejection* as the predicted variable was also significant, $F(2,564) = 6.79$, $p = .001$, $R^2 = .02$.

Table 2 Regression analyses for predicting self-perceived likability, peer-reported likability, and the discrepancy scores of likability

Criterion variable	Variables	B	SE B	β	t	p
Self-assessment	Social anxiety	-.27	.06	-.21	-4.90	<.001
	Depression	-.31	.05	-.24	-5.65	<.001
Peer-assessment						
	Acceptance					
Acceptance	Social anxiety	.03	.05	.03	.61	.541
	Depression	-.15	.05	-.15	3.30	.001
Rejection	Social anxiety	-.11	.05	-.12	-2.44	.015
	Depression	.16	.05	.17	3.58	<.001
Preference	Social anxiety	.09	.05	.09	1.96	.050
	Depression	-.18	.05	-.18	-3.94	<.001
Impact	Social anxiety	-.07	.05	-.08	-1.63	.103
	Depression	.01	.05	.01	.26	.793
Discrepancy score	Social anxiety	.30	.05	.25	5.68	<.001
	Depression	.02	.05	.02	.35	.729

Here, both social anxiety and depression were significant predictors, indicating that lower social anxiety scores and higher depression scores predicted being named more often as “least liked”. Similar results were observed for the regression model with *preference* as the predicted variable: The model was significant, $F(2,594) = 7.78$, $p < .001$, $R^2 = .03$, and both social anxiety and depression were significant predictors. Higher levels of social anxiety and lower levels of depression predicted higher preference scores. Finally, the regression model with *impact* as the predicted variable was not significant, $F(2,594) = 1.49$, $p = .226$, $R^2 = .01$; neither social anxiety nor depression predicted how often children were mentioned overall.

Discrepancy Between Perceived and Peer-Reported Likability

In order to assess the relation of social anxiety with the discrepancy between self-perceived and peer-perceived likability (Goal 3), we calculated a Pearson correlation. The discrepancy score of likability was significantly positively related to social anxiety, $r = .24$, $p < .05$, indicating that higher levels of social anxiety predicted an underestimation of likability by peers.

In order to control for the possible confounding effect of depression (Goal 4), another multiple linear regression analysis was performed with social anxiety and depression as predictors, and the discrepancy score as the dependent variable (see Table 2). This regression model was significant, $F(2,583) = 21.07$, $p < .001$, $R^2 = .07$. The only significant predictor in the model was social anxiety, indicating that higher levels of social anxiety, but not higher or lower levels of depression, predicted an underestimation of likability.

Discussion

The goal of this study was to examine the relation of social anxiety with self-perceived and peer-reported likability. Additionally, we included depression in all analyses as a possible confounding factor, due to its high overlap with social anxiety. First, our results suggest that children with higher levels of social anxiety perceived themselves as being less liked by their peers than children with lower levels of social anxiety. Second, unexpectedly, children with higher levels of social anxiety were in fact *better* liked by peers than children with lower levels of social anxiety. Third, social anxiety was a significant predictor of a biased perception of likability by peers, such that higher levels of social anxiety were related to underestimation of one’s own likability.

These results are in line with several studies that report lower self-perceived likability in children with high levels of social anxiety (e.g., Spence et al. 1999; Straus et al.

1984; Zimmer-Gembeck et al. 2007). Moreover, the relative underestimation of likability in children with higher levels of social anxiety compared to children with lower levels of social anxiety is in accordance with previous studies. Furthermore, the current study also indicated that the relation between social anxiety and likability was significant even after controlling for varying levels of depression, which had an independent relation with self-perceived likability. These results are in line with suggestions that children with social anxiety fear being less accepted by peers and perceive themselves as being less liked by peers (Bodden et al. 2009; Verduin and Kendall 2008). However, there are also some studies that report opposite results. For example, Inderbitzen-Nolan et al. (2007) compared subjective and objective ratings of anxious and non-anxious adolescents’ behavior. The objective ratings by adults indicated a social skills deficit, and the discrepancy scores between the objective and subjective ratings indicated the existence of only a small underestimation of social skills in socially anxious adolescents. The difference in findings between this study and ours could be explained by the difference in measures (social skills vs. likability), the difference in raters (adults vs. peers) and the difference in age (children vs. adolescents).

When looking more into the details of the current study’s results regarding the unexpected positive relation of likability with social anxiety, we see that children with higher levels of social anxiety were not named more often as being “most liked” (acceptance), but they were named less often as being “least liked” (rejection) than children with lower levels of social anxiety. These results seem not in line with previous studies which found that children with higher levels of social anxiety were less liked than children with lower levels of social anxiety (for a review, see Kingery et al. 2010). This might be due to different measurement methods. For example, Barrow et al. (2011) used external unfamiliar peer-observers, while La Greca and Lopez (1998) used self-reports, and our current study used peers from the classroom context. Moreover, there are a few studies that also found different results (Bell-Dolan et al. 1995; Crick and Ladd 1993). Crick and Ladd (1993) found that children who were rarely named as either “most liked” or “least liked” (neglected category) had significantly lower social anxiety than children who were categorized as ‘average’ or ‘rejected’. Clearly, more research is needed with multi-informants in order to arrive at a clearer picture of the relation between social anxiety and likability.

There are several limitations to the current study that need to be mentioned. First, the participating children were asked to name the classmates they liked most and liked least, without having a list of names of all the children in their class. Therefore, it could be that only some of the more aggressive disliked children were named as “least liked” because they were more noticeable than other children who are withdrawn

and disliked by their peers (e.g., Bierman 2004). In future studies, we recommend to provide children with a list of all their classmates. Second, the children were allowed to name only a maximum of six children they liked least. As a result, only the very least liked children could be mentioned, and not all the children who were disliked a little. In future studies, this could be improved by allowing participants to name as many peers as they want in both categories. Third, the current study used an unselected sample of pre-adolescent children. Future studies are needed that include selected samples or clinical samples, and also adolescent samples, to test whether the current findings generalize to clinical levels of anxiety and to older age groups. Fourth, this study used different phrases to measure self-reported versus peer-reported likability. In the self-reported likability question, children were asked to indicate their likability, whereas in the peer-reported likability question, all children were asked to name the six most liked and least liked children. In future studies, peer ratings should be measured with a similar wording as the self-reported likability measure. This creates the possibility to compare the two assessment types more directly, and to compare the scales without using standardized scores. Fifth, due to privacy regulations, very little demographic information was included in the study. It is thus unclear whether demographic factors (e.g., socioeconomic status or social anxiety of the parents) contributed to the observed differences in likeability. Finally, the current study only investigated social anxiety and likeability at one time point. The design of the current study limits generalizability and increases the chance of length-biased sampling. Longitudinal research is needed to disentangle the effects of (perceptions of) social functioning and social anxiety.

Studying the difference between self-perception and peer-perception could also generate starting points to determine which intervention might suit socially anxious children best. If future studies confirm the current finding that children with higher levels of social anxiety have a biased perception of their own likeability, this bias might be targeted by Cognitive Behavioral Therapy (CBT) or Cognitive Bias Modification (CBM). CBT and CBM interventions are based on cognitive theories which state that anxious individuals display anxiety-related schemata which direct attention, interpretation and memory towards threat-related information, resulting in cognitive biases (e.g., Rapee and Heimberg 1997). If children do indeed have a biased perception of their own likability, CBT or CBM could be appropriate interventions because they attempt to restructure negative interpretations (Beck and Weishaar 1989; Beard 2011; O'Donohue et al. 2004).

In conclusion, we found that children with higher levels of social anxiety displayed a negative perception bias of their own likability: Even though they were in fact less often named as disliked by their peers than children with lower

social anxiety scores, they perceived themselves as less liked by their classmates. This outcome suggests that is important to include both self- and peer-reports when studying likability, as it seems that children with higher self-reported levels of social anxiety incorrectly estimate themselves as less likable than children with lower levels of social anxiety do. Clearly, more studies are needed before firm conclusions can be drawn, but if future studies indeed confirm the current findings, this might suggest that socially anxious children might profit from treatments that facilitate a more accurate perception of their likability by restructuring negative interpretations, for example by means of Cognitive Behavioral Therapy or Cognitive Bias Modification.

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Compliance with Ethical Standards

Conflict of interest Jeanine M. D. Baartmans, Mike Rinck, Jennifer L. Hudson, Tessa A. M. Lansu, Rianne E. van Niekerk, Susan M. Bögels, Anke M. Klein declare that they have no conflict of interest.

Informed Consent All procedures were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Animal Rights No animal studies were carried out by the authors for this article.

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