



Behavior when socially anxious individuals expect to be (dis)liked: The role of self-disclosure and mimicry in actual likeability

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ABSTRACT

Background and objectives: This study aimed to unravel the relationship between socially anxious individuals' expectation of being (dis)liked and actual likeability by looking at the mediating role of both strategic and automatic social behavior: Self-disclosure as well as mimicry were examined.

Method: Female participants (N = 91) with various levels of social anxiety participated in a social task with a confederate. Before the task, participants indicated their expectation of being liked by the confederate. Afterwards, objective video-observers rated the likeability of the participants before and after the social task as well as their level of self-disclosure and mimicry.

Results: Social anxiety correlated negatively with the expectation to be liked but was not related to observer ratings of likeability, self-disclosure or mimicry. However, degree of social anxiety moderated the relation between expectations and self-disclosure. As expected, participants with low levels of social anxiety disclosed more if they expected to be liked. A reversed pattern was found for the high socially anxious participants: Here, *higher* expectations of being liked were related to *less* self-disclosure.

Limitations: The study used an analogue female sample. Our social interaction task was highly structured and does not reflect informal day-to-day conversations.

Conclusion: Socially anxious individuals function rather well in highly structured social tasks. No support was found for declined likeability or disrupted mimicry. Nevertheless, high socially anxious individuals did have a cognitive bias and show a self-protective strategy: when expecting a neutral judgment they reduce their level of self-disclosure. This pattern probably adds to their feelings of social disconnectedness.

1. Introduction

A core concern of patients with social anxiety disorder (SAD) is their fear of negative evaluation (APA, 2013). Cognitive models propose that people with SAD are prone to expect negative evaluations by others (Clark, 2005; Hofmann, 2007). Indeed, there is ample evidence that socially anxious individuals underestimate how they are evaluated compared to non-socially anxious individuals (Hirsch & Clark, 2004). On the other hand, an increasing number of studies have shown that socially anxious individuals do actually evoke negative responses in others. For instance, independent raters judged socially anxious individuals as less likeable than their non-socially anxious counterparts, both in studies with analogue (Blöte, Kint, & Westenberg, 2007; Creed & Funder, 1998; Meleshko & Alden, 1993; Papsdorf & Alden, 1998;

Pilkonis, 1977; Voncken & Dijk, 2013) and patient samples (Alden & Wallace, 1995; Voncken, Alden, Bögels, & Roelofs, 2008). An intriguing finding is that participants who were manipulated to believe that the person with whom they were about to interact did not like them, were actually liked less by this naïve interaction partner (Alden & Bieling, 1998; Curtis & Miller, 1986; Voncken, Dijk, de Jong, & Roelofs, 2010). Thus, the expectation of socially anxious individuals to be disliked may relate to or even elicit an actual dislike by others. If detected, subtle signals of rejection by interaction partners are believed to fuel their fear of negative evaluation and may maintain SAD (Alden & Taylor, 2004). The current study aims to gain more insight into social behaviors that are triggered by the expectation of being disliked, that may at the same time cause an actual dislike in others. We examined two type of behaviors that may mediate this relationship: a more strategic behavior;

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self-disclosure and a more automatic behavior; mimicry.

Patients with SAD tend to use self-protective strategies in social interactions (Alden & Taylor, 2004). Such strategies, also known as safety behaviors, are intended to prevent or minimize the feared catastrophe of a negative evaluation (Clark, 2005). Decreasing ones self-disclosure is one of the most prominent types of safety behavior and is of interest for this study because it is considered to be fundamental in social bonding (Altman & Taylor, 1973; Collins & Miller, 1994; Jourard, 1971). However, not all social behavior is intentional. Much of our social behavior occurs automatically, outside of our conscious control (e.g., Dijksterhuis & Bargh, 2001; Asendorpf, Banse, & Mücke, 2002). Therefore, it is of interest to also investigate less controlled behaviors that can nevertheless affect likeability judgments. Behavioral mimicry is a well-studied example of an automatic social behavior that affects likeability judgments (see Chartrand & Lakin, 2013 for a review). Because both mimicry and self-disclosure have a solid evidence base for their effects on liking, but are different in their level of conscious control, our aim was to examine if these behaviors mediate the relationship between the anticipation of a negative judgment and actual judgments of likeability in socially anxious individuals.

Self-disclosure is defined as “revealing personally relevant experiences, thoughts and feelings to others” (Collins & Miller, 1994). People who self-disclose naturally to others, or because they are instructed to do so, are rated as more likeable than people who do not show these behaviors (Collins & Miller, 1994). Research has demonstrated that individuals who believed that their interaction partner did not like them disclosed less personal information than those who believed that their interaction partner liked them (Curtis & Miller, 1986). There are some opposite findings with regard to self-disclosure in social anxiety (Kashdan & Roberts, 2004; Papsdorf & Alden, 1998). Yet, there is more support for the notion that socially anxious individuals disclose less personal information. This evidence derives from self-report (Cuming & Rapee, 2010; Sparrevoorn & Rapee, 2009), and also from interaction studies (Alden & Wallace, 1995; Pontari & Glenn, 2012; Voncken & Dijk, 2013). In addition, one study showed that reduced self-disclosure of socially anxious individuals affected their actual likeability ratings in a negative manner (Alden & Bieling, 1998). In this particular study, however, participants received explicit information about the judgment of their interaction partner and the beneficial effects of self-disclosure. Therefore, it remains unclear whether this effect is also observable when socially anxious individuals, as in real life, do not know beforehand whether an interaction partner likes or dislikes them and when they are not informed about the positive effects of self-disclosure.

Mimicry is the unintentional imitation of others' postures, facial expressions or gestures (Chartrand & Bargh, 1999; Chartrand & van Baaren, 2009). Like self-disclosure, behavioral mimicry is seen as ‘social glue’ and fundamental to social bonding (Chartrand & Lakin, 2013; Lakin, Jefferis, Cheng, & Chartrand, 2003). Accordingly, people who mimic others are rated as more likeable than people who do not (Chartrand & Bargh, 1999). One study into the mimicry of facial expressions further showed that the relationship is bi-directional: Liking also increases mimicry (McIntosh, 2006). Thus far, only two studies investigated if behavioral mimicry is related to social anxiety (Abbott & Kocovski, 2018; Vrijzen, Lange, Becker, & Rinck, 2010). Both studies investigated to what extent high and low socially anxious individuals mimicked an interaction partner in a predefined setting. Abbott and Kocovski (2018) used the classical setup of a confederate and the participant taking turns in describing photographs (Chartrand & Bargh, 1999), while the confederate displayed mimicable behaviors. Vrijzen et al. (2010) immersed participants in a virtual reality setting and asked them to watch an avatar giving a speech while displaying a variety of head movements during the speech. Both studies confirmed that high socially anxious individuals showed less behavioral mimicry than low socially anxious individuals. These first findings do not only ask for replication but, similar to self-disclosure, raise the question whether mimicry mediates the relationship between the expectation of being

(dis)liked and actual likeability.

The present study aimed to determine whether strategic self-disclosure and automatic mimicry behavior during a face-to-face interaction are both negatively related to social anxiety level. Secondly, and more importantly, we sought to unravel the rather complex relationship between the expectation of being (dis)liked and actual likeability. Self-disclosure and mimicry were both hypothesized to mediate this relationship. However, it could be that expected judgments affect socially anxious individuals differently than non-socially anxious individuals (e.g., Alden & Bieling, 1998; Voncken et al., 2010). Therefore, we explored if social anxiety level moderated this hypothesized mediation effects.

In order to examine these relations, female participants with various levels of social anxiety were asked to participate in a social task in which they took turns with a female confederate in describing pictures. To elicit self-disclosure and mimicry, the confederate followed a script in which her level of self-disclosure increased and used mimicry-eliciting behavioral mannerisms. Before the start of the social task, participants rated their expectation of being liked by the confederate. Video-observers rated the likeability of the participants before and after the social task and the level of self-disclosure and mimicry. Furthermore, non-verbal behavior was rated to ensure that the obtained effects were not the result of non-specific behavior.

First, it was expected that social anxiety was negatively correlated with the expectation of being liked, self-disclosure and mimicry. Second, we expected that when the expectation to be disliked increases, self-disclosure and mimicry decreases and that this is related to being rated as less likeable by the observers. So, we tested the mediating effects of self-disclosure and mimicry between expectation of being liked and likeability. Third, we examined whether these mediating effects were moderated by social anxiety.

2. Method

2.1. Participants

Female students were prescreened with the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). First, students that potentially knew the confederate were excluded. Second, following Voncken and Dijk (2013), we excluded students with a SIAS > 60 for ethical reasons and students with a SIAS < 7 as this might reflect a deviant level of social anxiety (see also the remark of Miller, 2010, p. 134 on this issue). We invited students with low (SIAS = < 15, following Voncken & Dijk, 2013) and high ratings on the SIAS (SIAS ≥ 25, which is ½ SD below the SAD female patient sample of Mattick & Clarke, 1998; Mean = 33.4; SD = 16.4). This high social anxiety group comprised the top 22% of the prescreened sample. See also Fig. 1. Repeated SIAS measurement on the testing day showed that a substantial number of participants deviated from their initial SIAS rating. Because we did not want to exclude these participants, social anxiety was used as a continuous predictor in all analyses. Participants' SIAS scores showed considerable variation ($M = 20.18$, $SD = 11.32$, range 5–53) and 12.1% of participants had a score higher than 35, which can be considered in the clinical range (Heinrichs et al., 2002). There was no correlation between social anxiety and age, $r = -0.09$, $p = .41$, and years in school, $r = 0.22$, $p = .07$. Participants spoke Dutch, except for three participants (i.e., 2 English, 1 German).

2.2. Questionnaires

Social anxiety. Social anxiety was assessed with the SIAS (Mattick & Clarke, 1998). The SIAS consists of 20 items on a 5-point Likert type scale, measuring participants' fear of scrutiny by others or of social interactions. Internal consistency ($\alpha = 0.94$) and test-retest reliability (4 weeks, $\alpha = 0.92$) are good (Mattick & Clarke, 1998). The used Dutch translation of the SIAS has not been validated. Nevertheless, previous

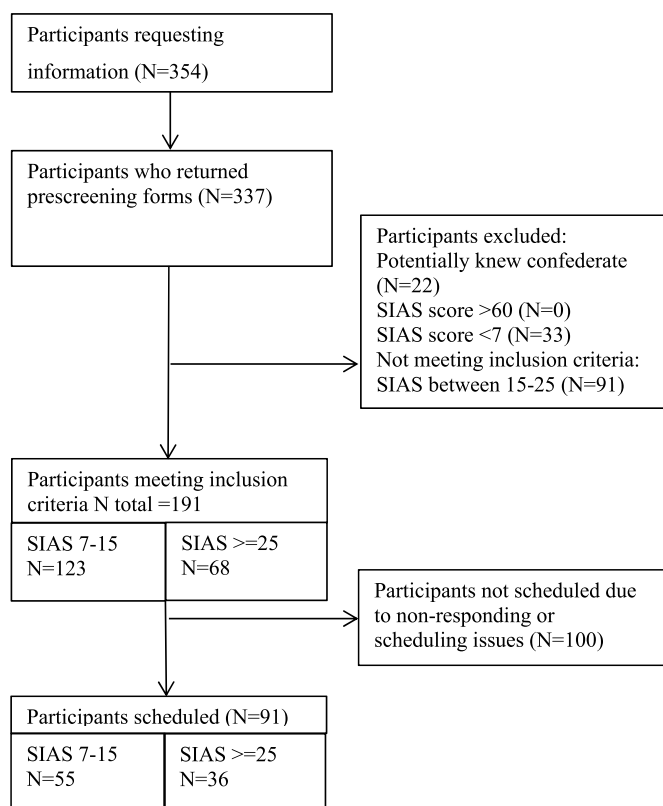


Fig. 1. Flowchart recruitment participants.

studies show good internal consistencies comparable to that of the original version (e.g., Chow et al., 2018; Voncken & Dijk, 2013). Cronbach's alpha in the current study is 0.93.

State anxiety. To explore situational levels of anxiety before and after the task, state anxiety was assessed with the Dutch state version of the State-Trait Anxiety Inventory (STAI-state; Van der Ploeg, Defares, & Spielberger, 1980). The STAI-state consists of 20 self-statements that are rated on a 4-point scale. Internal consistency of the STAI-state ($\alpha = 0.88$) is good (Van der Ploeg et al., 1980). In the present study Cronbach's alpha was .93.

2.3. Photo-task

The confederate and participant were seated in chairs with an angle of 45° facing each other and placed in front of a TV screen on which the pictures were shown (similar to Chartrand & Bargh, 1999, exp. 1). The pictures were selected from the Internet and consisted of neutral to positive scenes of people engaging in activities such as a campfire, skating or relaxing in a park (see Appendix 1 for details). Ten raters confirmed that the photos were neutral to positive (mean 5.2 to 7.5 on a scale from 1, negative to 9, positive). The confederate and participant took turns in describing five pictures each. The confederate always started and followed a memorized script. The individual pictures were shown for 10 s. Then a beep followed, as a reminder to start describing the photo until after 90 s another beep went off indicating that the turn had ended.

The cover story (similar to Chartrand & Bargh, 1999), informed participants that we were in the initial stage of creating a new, modern version of the Rorschach projective test, in which photographs would be used instead of ink dots. Participants were told that it was tested whether students could easily describe the chosen photos. Right before the photo task began, the research assistant gave the following instructions (based on Chartrand & Bargh, 1999, exp 1):

'What you could do is to describe the things you see on the pictures,

but you could also describe associations that come to your mind or describe things you have experienced, for instance, your own memories. You can also describe what a person on the photograph might feel or think. So, describe memories that come to your mind and associations you might have.'

The confederate was trained to follow a script in which the level of self-disclosure was increased with every picture (see Appendix 1) and to actively seek eye-contact with the participant. To elicit mimicry, she moved her arm upward as if brushing through her hair or touched her neckline four times per photo (also similar to Chartrand & Bargh, 1999).

2.4. Participants and observer ratings and assessment

Expectation of being liked. To measure the expectation of being liked, the Desire for Future Interaction scale (DFI; Coyne, 1976) was changed so that it asked for the participant's estimate of how much the confederate wished to interact with her in the future (i.e., the expected DFI). The original DFI measures the degree to which the rater wishes to engage in future social activities with another person and is a well-established and reliable questionnaire (e.g., Papsdorf & Alden, 1998; Voncken et al., 2008). The DFI consists of 8 items rated on a 5-point Likert type scale ranging from 1, 'rather not' to 5, 'very much'. The reliability of the expected DFI as used in the current study was good (Cronbach's alpha = .80).

Likeability. Likeability was assessed by video raters with the original DFI at two time points: 1) right at the first moments of entrance in the laboratory and 2) after finishing the photo task. Change in likeability was the difference between these two assessments. The internal consistency of the DFI rated by the video-observers was good (range Cronbach's alpha before the photo task was: 0.78 - 0.98; after the photo task: 0.83 - 0.99). The interrater reliability (ICC, two-way mixed model, absolute agreement, average measures) was moderate (DFI before photo task: ICC = 0.66, DFI after photo task: ICC = 0.75), which is comparable to other studies where liking is assessed by observers (e.g., Voncken, et al., 2010).

Self-disclosure and non-verbal behavior. Self-disclosure and non-verbal behavior were assessed by video raters with an adjusted Self-Disclosure Behavior Scale (Voncken & Dijk, 2013) using 9-point Likert type scale items ranging from 1, 'not at all' to 9, 'very much'. Self-disclosure was assessed with four items: 1) the extent to which the participant used personal associations to describe the photos 2) the quantity of superficial associations, 3) personal memories and 4) associations on a deeper emotional level. Non-verbal behavior was rated with 10 items. Four items were rated only when the participant was listening to the confederate (responding to the confederate, out-loud reactions like laughing, listening sincerely, responding to the self-disclosure of the confederate). Three items (looking at the confederate, open posture, showing facial expressions) were rated twice: while describing the photos and while listening to the confederate.

The items were rated after each photo that the confederate and participant described. For both behaviors a total mean was calculated: a higher score indicates more self-disclosure and non-verbal behavior. The internal consistency (respectively: $\alpha = 0.88$; $\alpha = 0.90$) and interrater reliability (respectively: ICC = 0.81; ICC = 0.80, two-way mixed model, absolute agreement, average measures) was good.

Mimicry. Video raters counted each upward arm movement of the participant within a 90 s baseline (see Procedure) and during the photo task. Following Stel and Vonk (2010) the hand movements that followed within 10 s after the hand movement of the confederate were rated as behavioral mimicry. The final mimicry score was determined by the percentage of movements that were considered as behavioral mimicry on the total rated hand movements. The interrater reliability was high (ICC = 0.91, two-way mixed model, absolute agreement, single measures).

2.5. Video raters

Three different sets of video-raters were used in order to prevent carry-over effects between the raters. All raters were blind to the condition of the participants, background and hypothesis of the study. The raters were either bachelor or master students.

Set 1. A group of 10 raters, 2 males and 8 females, rated the likeability of the participants. Six rated the whole set of participants, 2 rated one half and 2 rated the other half of the sample. As likeability is a highly subjective rating, the video raters did not receive training. Raters were not allowed to rate participants that were familiar to them. Therefore, in 46% ($n = 42$) of the participants one ($n = 24$), two ($n = 11$), three ($n = 2$) or four ($n = 3$) liking ratings were missing. To calculate the interrater reliability, multilevel analyses were used and were based on available ratings.

Set 2. Two female students rated the participants with the Self-Disclosure Behavior Scale. They received a 2-h training in which pilot videotapes were used to ensure their rating skills.

Set 3. Two female students rated the participants on mimicry behaviors. To establish the interrater reliability, one rated all the participants, the other rated 34 participants. Both received 2-h of training and rated 2 pilot videotapes.

2.6. Confederate

The confederate was a female undergraduate student (age 21). A same-sex confederate was used as levels of self-disclosure and perceived stress differ between same-sex and opposite sex dyads (Alden, Teschuk, & Tee, 1992; Collins & Miller, 1994). The training of the confederate consisted of several trials with the experimenters, followed by a pilot with 19 female participants.

2.7. Procedure

The participants were welcomed, while the confederate was already seated in the room. The bogus aim of the study and the different assessments were explained briefly. After providing written consent, the confederate and the participant were asked to fill out questionnaires (among which the SIAS, expected DFI and STAI-state) in separate rooms. After completing the questionnaires, the participant was asked to wait for the confederate, who had supposedly completed her questionnaires in another room. During this time a baseline measurement of 90s for arm movements was recorded for the mimicry assessment. Next, the experimenter re-entered the room with the confederate and delivered the instructions for the photo-task. After the completion of the task, the participant was asked to fill out some extra questionnaires and was fully debriefed and rewarded for participation.

2.8. Data analyses and power

Outliers. For the mimicry variable three outliers were adjusted by replacing them with the mean of the subgroup of the sample plus 3SD.

Analytic plan. The relationship between the different variables in the model was tested by means of Pearson's correlation. To analyze our expected mediation effects, a moderated mediation model was assessed by examining (moderated) indirect effects using a bootstrapping procedure ($N = 5000$ bootstrap resamples) with mean centered values for product terms (Preacher, Rucker, & Hayes 2007). The expectation of being liked (i.e., expected DFI) was the independent variable whilst the development of likeability (i.e., after minus before change scores of DFI by video raters) was the dependent variable. Three mediators were considered: a) verbal self-disclosure, b) mimicry, and c) non-verbal behavior. The relations between the independent variable and the three mediators as well as between the mediators and the dependent variable were hypothesized to be moderated by social anxiety level.

Conditioning values for this continuous moderator were set at the low = 16th, mid = 50th, and high = 84th percentile of SIAS scores.

Power. We conducted a power analysis based on the effect sizes of previous studies. Previous studies found a medium effect size for the relation between social anxiety and the increase in likeability and a high effect for the relation between social anxiety and the expectation to be liked. (e.g., Voncken & Dijk, 2013; Voncken et al., 2010). Furthermore, the effect size of the relation between self-disclosure and social anxiety varies from small/medium to very large (Papsdorf & Alden, 1998; e.g., Voncken & Dijk, 2013). One previous study showed that the relationship between social anxiety and reduced bodily mimicry has a medium effect size (Vrijssen et al., 2010). Combining these findings, we used medium effect sizes for the power analyses. For the main effects, a sample of 86 should be sufficient to obtain a power of .9. Furthermore, to establish mediation, a sample size of 78 would be needed (Fritz & MacKinnon, 2007). Power estimates for the moderated mediation analyses are more difficult to establish. Simulation analyses by Preacher and colleagues (2007) showed that using regression coefficients for bootstrapping procedures with an N of 100 resulted in a power of .19 for small ($b = 0.14$) and a power of .99 for medium ($b = 0.39$) effect sizes, which indicates a wide range of possible power.

3. Results

Due to technical failures some data of 7 participants (LSA $n = 5$; HSA $n = 2$), were lost for the video ratings. When only the sound was unavailable, mimicry could be rated. Because the number of participants differed per variable, Table 1 present the exact n per variable.

3.1. Overall correlations and descriptives

As expected, social anxiety was negatively correlated with the expectation to be liked. Unexpectedly, no correlations with social anxiety were found for likeability ratings before and after the social task, change in likeability, self-disclosure, mimicry and non-verbal behavior. Although the behaviors were not related to social anxiety, the expectation to be liked was related to more open non-verbal behavior whilst both self-disclosure and non-verbal behavior were positively correlated with an increase in likeability, and again, independent of social anxiety. For an overview of all correlations, see Table 1.

The photo-task showed the expected increase of self-disclosure while describing the subsequent photos. A repeated measures ANOVA, with level of self-disclosure after each of the 5 photos as the within subject variable showed a linear main effect of time, $F(82,1) = 145.6$, $p < .001$, $\eta^2 = 0.64$. Furthermore, as expected, social anxiety related to the STAI state anxiety measure both before ($r = 0.54$, $p < .001$) and after ($r = 0.53$, $p < .001$) the task.

Table 1
Mean, standard deviations and simple correlations.

	M	SD	N	r							
				2	3	4	5	6	7	8	
1. Social anxiety	20.19	11.32	91	-.36 ^b	.03	-.03	.07	-.08	-.07	-.04	
2. Expectation to be liked	3.02	0.49	91	-	.05	.16	.31 ^b	.08	.07	.10	
3. Self-disclosure	4.50	1.27	85	-	-.11	.53 ^b	.21	.39 ^b	.42 ^b		
4. Mimicry	40.16	17.43	87	-	-.08	-.17	-.14	-.06			
5. Non-verbal behavior	5.62	0.87	83	-	-.28 ^a	.41 ^b	.36 ^b				
6. Likeability before	3.07	0.51	85	-	-.08	.82 ^b	.19				
7. Likeability after	3.24	0.55	85	-	-.08	.72 ^b					
8. Increase likeability	0.21	0.33	85	-	-.08	-					

^a $p < .05$.

^b $p < .01$.

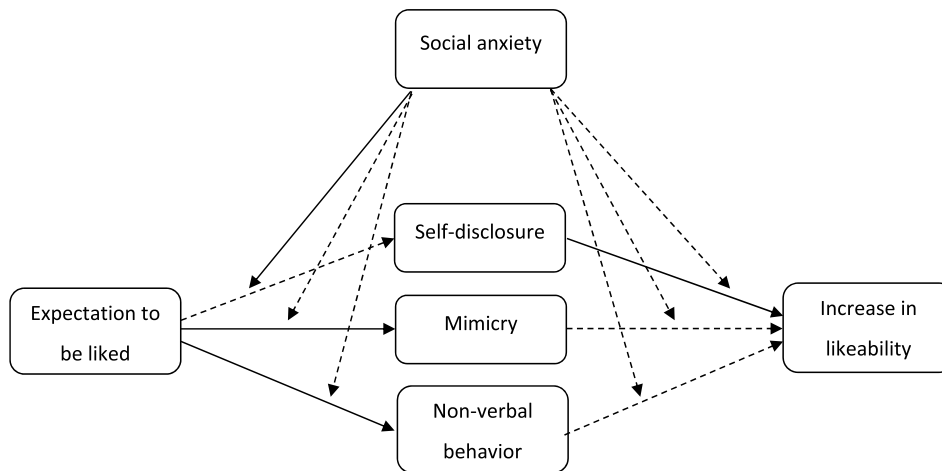


Fig. 2. The tested moderated mediation model. Solid lines represent a significant ($p < .05$) relation.

3.2. Moderated mediation analyses

The tested model is displayed in Fig. 2 and the bootstrap results for parameter estimates and conditional indirect effects are displayed in Table 2. As can be seen in Table 2, the level of social anxiety moderated the relationship between the expectation of being liked and the amount of self-disclosure. A graphical representation of this interaction is displayed in Fig. 3. The moderation effect indicated that in low anxious participants, the expectation of being liked positively affected self-disclosure, and Johnson-Neyman significance regions showed that with a SIAS score of 13.45 or lower, this slope reaches significance. For the high anxious participants, however, this pattern was reversed. Here the significance regions showed that with a SIAS score of 31 and higher, participants that expected to be liked disclosed to a lesser degree. In addition, self-disclosure was related to an increase of likeability (see Table 2). Moderated mediation effects showed that for the low socially anxious group, self-disclosure mediated the relationship between the expectation of being liked and increase in likeability (see Table 2). This, however, was not significant for the middle and high anxious group.

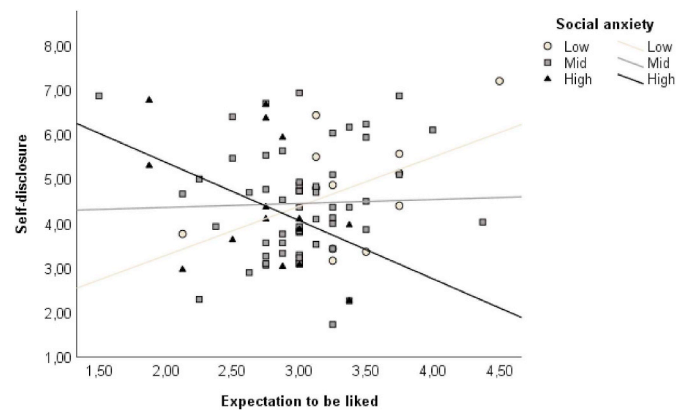


Fig. 3. Scatterplot of the correlation between the expectation to be liked and self-disclosure for three social anxiety levels.

With regard to mimicry, the expectation of being liked was related

Table 2

Bootstrap results for parameter estimates and conditional indirect effect.

Model	Parameter estimates			Conditional indirect effects		
	<i>a</i> or <i>b</i>	<i>se</i>	95% <i>CI</i>	<i>a</i> * <i>b</i>	<i>se</i>	95% <i>CI</i>
<i>Self-disclosure (M1)</i>						
Expectation to be liked	0.09	0.32	-0.51; 0.76	Low	0.10	0.01; 0.24
Social anxiety	-0.01	0.01	-0.04; 0.02	Mid	0.03	-0.02; 0.13
Interaction	-0.08	0.03	-0.14; -0.03	High	-0.07	-0.28; 0.11
<i>Mimicry (M2)</i>						
Expectation to be liked	7.37	3.12	0.79; 13.23	Low	-0.01	-0.05; 0.03
Social anxiety	0.20	0.17	-0.10; 0.55	Mid	-0.01	-0.04; 0.02
Interaction	0.42	0.31	-0.12; 1.07	High	0.02	-0.12; 0.15
<i>Non-verbal behavior (M3)</i>						
Expectation to be liked	0.67	0.20	0.28; 1.08	Low	0.04	-0.10; 0.20
Social anxiety	0.01	0.01	-0.00; 0.03	Mid	0.04	-0.05; 0.15
Interaction	-0.02	0.02	-0.06; 0.02	High	0.03	-0.09; 0.18
<i>Increase in likeability (Y)</i>						
Expectation to be liked	-0.00	0.09	-0.18; 0.18			
Self-disclosure	0.09	0.04	0.01; 0.18			
Mimicry	-0.00	0.00	-0.01; 0.00			
Non-verbal behavior	0.06	0.07	-0.08; 0.21			
Social anxiety	-0.00	0.00	-0.01; 0.01			
Interaction M1	-0.00	0.00	-0.01; 0.01			
Interaction M2	0.00	0.00	0.00; 0.00			
Interaction M3	0.00	0.01	-0.01; 0.02			

Note. Confidence intervals that do not contain a zero are bold.

to mimicry when controlled for social anxiety, but mimicry did not relate to an increase of likeability (see Table 2). With regard to mimicry-unrelated, non-verbal behavior, expectation of being liked was related to an increase of such behavior, when controlled for social anxiety (see Table 2). However, non-verbal behavior did not relate to an increase in likeability, when all other variables were controlled for.

4. Discussion

This study was designed to shed light on the relationship between the expectation of being liked and actual likeability in socially anxious individuals. We explored the role of two social behaviors during the social task as potential mediators on this relationship: self-disclosure and behavioral mimicry. Non-verbal behavior, was used to control for non-specific behavior. The results can be summarized as follows. First, in line with our hypotheses, we found that the higher the social anxiety level of the participants, the more they expected a negative evaluation from the confederate. However, in contrast to our expectations, no associations were found between social anxiety and observer ratings of likeability, self-disclosure and mimicry. Second, a surprising pattern for the relationship between the expectation to be liked and self-disclosure occurred: Low anxious individuals, as expected, disclosed more if they expected to be liked more. However, this pattern was reversed in the high anxious participants: the *higher* the expectation of being liked the *less* self-disclosure these individuals displayed, and vice versa. Third, we found the expected mediating effect of self-disclosure only in low anxious participants. This indicates that self-disclosure in low anxious individuals increased their likeability. The high anxious individuals, on the other hand, did not seem to benefit from enhanced self-disclosure. Fourth, in contrast to expectations, mimicry was not a mediator between the expectation of being liked and changes in likeability. Note that, because we controlled for non-verbal behavior, we can conclude that the effects were not explained by non-specific behavior. In this discussion, we will first focus on the overall effect of social anxiety on judgments of likeability and then go into detail concerning the effects of self-disclosure and mimicry.

Social anxiety did not relate to observer rated likeability, indicating that high socially anxious individuals were considered as likeable as their low socially anxious counterparts. This result is unexpected and in contrast to a number of previous studies in both analogue (Blöte et al., 2007; Meleshko & Alden, 1993; Papsdorf & Alden, 1998; Pilkonis, 1977; Voncken & Dijk, 2013) and patient samples (Alden & Wallace, 1995; Voncken et al., 2008). Yet, our findings could be explained by the fact that the social task we used was highly structured. That is, the participants received explicit instructions on when to speak and when to be silent. The topic of conversation was clearly defined (the photo on the screen), they were not confronted with unexpected questions, and the confederate 'demonstrated' what was to be done, as she was the first to describe a photo. Several studies have demonstrated the effect of the level of structure of social contexts on behavior of socially anxious individuals. For instance, socially anxious individuals are more negatively evaluated in an *unstructured* waiting room setting than in a more structured getting acquainted setting (Thompson & Rapee, 2002; Voncken & Dijk, 2013). In addition, socially anxious individuals perform worse in a more *unstructured* setting where they are getting acquainted than during a more structured speech (Alden & Wallace, 1995; Baker & Edelmans, 2002; Stopa & Clark, 1993; Voncken & Bögels, 2008), even to the extent that, during a speech, no differences in social performance are observed between the two groups (Rapee & Lim, 1992; Voncken et al., 2008). Interestingly, the same seems to hold for self-disclosure. The prior studies that used more structured social contexts did not find differences in self-disclosure between high and low social anxiety groups (Kashdan & Roberts, 2004; Papsdorf & Alden, 1998). In contrast, the studies in which less structured tasks were used (Alden & Wallace, 1995; Voncken & Dijk, 2013), or the participants did not have another person to demonstrate what was expected (Pontari & Glenn,

2012), socially anxious individuals did show marked reductions in self-disclosure. Thus, the context of high structure and clarity of what is expected might explain why no effect for social anxiety was found on both liking and self-disclosure in our study.

From the above then, it could be concluded that in structured social settings, socially anxious individuals do not have problems with likeability but have a cognitive bias with regard to their anticipated judgment. That is, in these social situations they predict a more negative evaluation than they actually receive. This fits well with the robust findings of cognitive biases in social anxiety (Hirsch & Clark, 2004) and with the primary focus on these biases in the state of the art treatment programs for SAD (Clark, 2005; Clark et al., 2006).

Next to the expectation of not being liked, we found a pattern of self-disclosure in our high socially anxious individuals that could account for their feelings of difficulties to bond with others: While in the low socially anxious individuals a higher expectation of being liked related to *increased* self-disclosure, the high socially anxious individuals showed the exact opposite pattern. Here, a higher expectation of being liked was related to *decreased* self-disclosure. It is noteworthy though, that in the high anxious group the expectation of being liked was lower than that in the lower socially anxious individuals. Therefore, it would be more accurate to say, that when high socially anxious individuals were rather neutral about whether they were liked or not they *decreased* their self-disclosure level.

Before we try to interpret this outcome, we need to note that this result contrasts findings of Alden and Bieling (1998). That is, in the condition in which Alden and Bieling (1998) increased the expectation of being liked their high socially anxious group showed *more* self-disclosure: a comparable pattern as in our low socially anxious participants. However, as described earlier, their study included statements about the beneficial effects of self-disclosure and participants were reassured that the confederate liked them. We did not give the participants any such hints. This means that our high socially anxious individuals were, like in real life, not sure if the confederate would truly like them and if self-disclosure would be appreciated.

Having said this, it seems that in our study the natural response of our higher socially anxious individuals was to *decrease* self-disclosure when they were rather neutral about whether they were liked or not. In situations where they have such neutral expectations, socially anxious individuals seem to miss out. That is, their decreased level of self-disclosure thwarts their desire to be liked. By not displaying personal information when expecting to be liked, they may have intended to prevent being turned down later on (Weeks, Heimberg, Rodebaugh, & Norton, 2008). In other words, they were better safe than sorry. Research does indeed suggest that not revealing personal information serves as a way to forestall negative outcomes and supports the notion that decreased self-disclosure is part of strategic self-protective strategies of socially anxious individuals (Alden & Taylor, 2004; Clark, 2005; Leary & Kowalski, 1995).

A rather puzzling finding was that we found evidence for the opposite pattern as well: when high anxious participants expected clear dislike, they *increased* their self-disclosure level. This finding is partially in line with the findings of Kashdan and Wenzel (2005) in which participants were instructed to self-disclose during a 45 min conversation. Dyads of high socially anxious individuals showed the highest self-disclosure levels compared to dyads of low anxious individuals. The authors concluded that these high anxious individuals were pleasantly surprised with the openness of the other person especially *because* they had such low expectations to begin with. Since in the current study the confederate self-disclosed already from the first picture on, a similar effect might have occurred in the current here. Nevertheless, this interpretation is speculative and clearly asks for more research. Bearing in mind, however, that increase and positive effects of mutual self-disclosure is fundamental in bonding between people (Altman & Taylor, 1973), the reversed pattern of self-disclosure of socially anxious individuals, when compared to non-anxious individuals, may explain

their feelings of disconnectedness with others.

In contrast to self-disclosure, there was no correlation between social anxiety and behavioral mimicry. This is not in line with the two other studies that investigated mimicry in social anxiety (Abbott & Kocovski, 2018; Vrijzen et al., 2010). Both found reduced mimicry in their high social anxiety groups. While differences with the Vrijzen et al. (2010) study could easily be explained by methodological issues (free listening to a monologue in a VR environment vs highly structured, real interaction in our study) deviations from Abbott and Kocovski's (2018) findings are more troublesome. They did find lower instances of mimicry in their high social anxiety group, though only when describing the pictures, not while listening. The authors argued that elevated state anxiety during the picture description may have led to decreased mimicry. The present study did not differentiate between the picture description and listening phase. In addition, social anxiety was clearly related to elevated state anxiety but not to the amount of mimicry. Clearly, more research is necessary to understand the effects of social anxiety on behavioral mimicry.

The expectation of being liked did not significantly increase mimicry, although the effect was in the expected direction. When social anxiety level was controlled for, the expectation to be liked did relate to mimicry. This fits with well documented findings that having an affiliation goal increases mimicry (Lakin et al., 2003). The fact that our overall effects were not as strong as expected, might indicate that this study lacked enough statistical power to show this subtle effect of expectation of being liked on mimicry. Taking this into account, these results seem to indicate that the mimicry behavior in socially anxious individuals is still intact. Moreover, in the high socially anxious participants, the presence of intact behavioral mimicry combined with the decrease of self-disclosure seems to indicate that socially anxious individuals that expected to be liked are still able to unconsciously display mimicry but seem disrupted in more strategic use of self-disclosure.

Although the expectation of being liked seemed to increase mimicry, mimicry itself was not related to an increase in likeability in both groups. This was unexpected considering the substantial number of studies demonstrating that mimicry enhances liking (see extensive review by Lakin et al., 2003). However, in those studies the confederate that displayed the to-be-mimicked behavior also rated the likeability of the participant. We chose to assess likeability by independent video-observers because we considered the confederate to be a less reliable rater as she was forced to act in an unnatural way. The fact that video-observers rated the likeability of the participant may have undermined the likeability effect of mimicry. Seeing a person mimicking someone else has less informational value for an observer. Listening to someone self-disclose, on the other hand, helps getting to know the person and form an opinion about them.

A clinical implication of our findings is that socially anxious individuals need to overcome their tendency to close-up especially when they have rather neutral expectations. Previous studies indicate that socially anxious people dare to open up to the same level as low anxious individuals when they are reassured that their interaction partner likes them and when psycho-educated that self-disclosure is appropriate to use (Alden & Bieling, 1998). Alden, Buhr, Robichaud, Trew, and Plasencia (2018) describe an effective treatment regimen in which people with SAD experiment with opening up to people and experience the positive reward of other people opening-up to them. Another clinical implication is that socially anxious individuals seem to function

rather well in highly structured social settings. This implies that treatment should focus on the individual practicing more unstructured social interactions, e.g., chit-chatting in a waiting room, having a talk with a neighbor or having lunch with colleagues, and not so much on more structured interactions like meetings or speeches.

Our study has important limitations. To increase homogeneity we only included female participants and our confederate was female. Opposite sex dyads show different self-disclosure patterns (Alden et al., 1992, p. 254; Collins & Miller, 1994). Therefore, our conclusions are restricted to female interaction. We intentionally chose to work with only one confederate in order to decrease variance in behavior, however, this also decreased the external validity of the study. Moreover, our photo task was highly structured and does not represent day-to-day social interaction. This also holds for our mimicry assessment that was limited to arm movements and did not include body-posture or facial mimicry. In addition, we used an analogue sample of mainly psychology students. Thus, we cannot draw conclusions for people with SAD that are heterogeneous in education level and age. Last, it is possible that some effects in the current study might not have reached significance due to low statistical power, such as the main relation between the expectation to be liked and mimicry. Yet, most of the null results have very small effect sizes, which deems it rather unlikely that the results change considerably after increasing sample size. Despite these limitations, our study has some considerable strength, we assessed our variables at different time-points which allowed us to study mediation relations over time. Moreover, we used three different sets of video raters in order to prevent carry-over effects between the ratings.

Concluding, we did not find disruptions in automatic mimicry behavior in socially anxious individuals. Even so, our study adds to a series of studies that socially anxious individuals seem to function rather well in highly structured social tasks: social anxiety did not relate to ratings in likeability. Accordingly, social anxiety was marked with a cognitive bias with regard to the judgment they expected. Most importantly, socially anxious individuals showed a reversed pattern of using self-disclosure compared to non-anxious individuals: when having neutral expectations of being liked, they reduced their level of self-disclosure, probably as part of a self-protective strategy. This indicates that it is worthwhile for socially anxious individuals to experiment in opening-up to other people.

CRediT authorship contribution statement

Marisol J. Voncken: Conceptualization, Methodology, Resources, Writing - original draft, Writing - review & editing, Supervision, Funding acquisition. **Corine Dijk:** Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing, Visualization. **Wolf-Gero Lange:** Conceptualization, Methodology, Writing - review & editing. **Lizzy M.M. Boots:** Software, Investigation, Project administration. **Jeffrey Roelofs:** Formal analysis.

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Appendix 1

Parts of the script of the confederate that included the self-disclosure

Photo	Self-disclosure
1 Park in summertime. People relaxing	... The park looks a little bit like the park near my house. It also has these lanes and different walking routes. I often go there in the summertime with friends, and we all bring food and snacks and well ... we always have a great time there!...
2 A playground with a big tree. Many playing children around it	... Well, I used to go to the park a lot too, with my parents and my brother and sister. There also was a tree, but it had not fallen over, but it had many of these low branches. As a child, I loved to climb in them. We brought old bread to feed the ducks and if the weather was good, we got ice-cream. There were also many children playing there and I really loved coming there
3 People sitting at a campfire near a lake at sunset Yeah, I like that a lot, looking at beautiful sunsets like this one. Hmm ... this picture also really reminds me of the 'good old days' when I was a girl-scout. We often went camping for a weekend and at night we made campfires and roasted marshmallows as well. I really have great memories about those days. We could just play and we were so free. I feel, when I'm thinking about it now that I really miss that, that great feeling of togetherness
4 A frozen lake with trees on the side and people ice-skating	... I love ice-skating myself. Last winter I actually bought new racing skates and I often went skating on the skating rink nearby. But skating on real ice is so much better of course, but we can't do that very often here. In the year after high school and before college, I actually went to Sweden and skating was amazing there. That was so awesome! Although ... it was also a bit difficult to be out of Holland for a while. I was really surprised, but I missed my family so much. I was really homesick, I didn't expect that at all. Sometimes it was so bad, I had the urge to jump in a plane, that's how bad I missed my family. But oh well ... now I'm back thank goodness ...
5 A small square with a terrace where people are having a drink	... I see a boy and a girl holding hands, it looks like they are a couple. Obviously, it is nice to have a boyfriend to do stuff with ... go for a walk or have a drink together. Uhhmm ... Haha it's kind of funny, I also had a date last week, with a boy from my tutorial group. That was very exciting of course because we only knew each other from the university. I just called him up with an excuse about one of the assignments and asked him to meet me for coffee and then he suggested to meet at the market square, so that was nice. It was a lot of fun, hope he thought so too. Now it's a little bit exciting how the story continues, but oh well ...

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