Behavioral Assessment of Social Anxiety in the Free Speech Task

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Abstract

The current study aimed to improve understanding of the behavioral indicators of social anxiety in the Free Speech Task. Building on the current theoretical knowledge about social anxiety, we developed a rating system to maximize the sensitivity of the behavioral anxiety assessment in the Free Speech Task. Participants with social anxiety and a control group were asked to give a free speech about their study for two minutes. A general measurement of anxiety and different specific behavioral indicators of anxiety were assessed. The scores were rated on inter-rater reliability and the behavioral strategies for socially anxious and non-anxious participants were compared. The rating of general anxiety did not differ between the anxious and the non-anxious group, only one specific measurement (fumbling/self-manipulation) did differ significantly between these two groups. These results indicate that socially anxious and non-anxious individuals differ in their internal physical behavior. This finding might have implications for the behavioral assessment of social anxiety.

Anxiety is described as an affective state of the organism that is characterized by a feeling of stress and threat (Stöber & Schwarzer, 2000). Accompanying this feeling, a heightened activation of the nervous system can be observed in the fearful organism. Some studies suggest that individuals with social anxiety are (hyper-) sensitive to physiological changes in their own body (Clark & Wells, 1995). In the “cognitive model of social phobia” proposed by Clark en Wells, they suggest that a model of fear should have three dimensions: cognition, physiology and behavior. Edelmann and Baker (2002) found that individuals with social anxiety did not differ in their physiological state, but in the assumed cognition. Mauss, Wilhelm and Gross (2004) reproduced these findings, but did not report any significant differences in behavior. That is opposite to the findings of Clark and Wells (1995) and the findings of other studies (Mauss, Wilhelm & Gross, 2004.).

The current study is part of a research project on social anxiety, which aims to gain knowledge of the correlates between the cognitive, physiological and behavioral aspects of social anxiety. In this article we describe a behavioral assessment scale that maximizes the sensitivity of the behavioral anxiety assessment for the Free Speech Task. Behavioral assessment tasks, such as the Free Speech Task, have been shown to elicit anxious thoughts and produce change in blood pressure and heart rate (Chiauzzi, Heimberg, Becker & Gansler, 1985). This makes behavioral assessment tasks good paradigms for experimentally creating feelings of social anxiety.

In this study, we were particularly interested in the correlations between specific ratings of anxious behavior and the general measurement of anxiety, as well as differences in behavior between the socially anxious and the control group. We expect that the specific rating of anxiety behaviors are correlated with each other and that they are correlated with the general rating of anxiety. We also expect that anxious and non-anxious participants will behave differently. Furthermore, we expect the anxiety behaviors to cluster into three factors: internal anxiety behaviors, external anxiety behaviors and social anxiety behaviors.

Method

Participants

Participants in this study were female students, most of them studying educational science at the TU Dresden, Germany. Questionnaires were given to 300 students in several lectures. The questionnaires included a combination of criteria of social phobia from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM IV). Participants indicated on a 5 point Likert scale how often they show anxious and avoidant behavior that matches the DSM criteria for social phobia. The maximum score was 15 points. We choose the cut-off score to include the 10% most anxious and the 10% less anxious participants into the study. The cut-off score was less than 5 points for the non-anxious group and more than 10 points for the anxious group. At first a half-structured interview, the Internationale Diagnose Checklisten für ICD-10 *(*ICDL; Hiller, Zaudig & Mombour, 1995), was conducted by a trained professional to asses the criteria used in a diagnosis of social phobia in the ICD-10-Classification. Additionally the German version of the Liebowitz Social Anxiety Scale (LSAS) was used to asses social anxiety. These two measures ensured proper inclusion into the anxious/non-anxious groups. Participants who did not meet all necessary criteria (Table 1), were excluded from the study.

Table 1

Inclusion Criteria

Distinct fear or avoidance of at least one situation in which one must interact with a stranger (giving a talk, talking with an authority figure, going out, etc.).
Confrontation with the feared social situation results in immediate fear reactions.
The person acknowledges that the fear is disproportionate and unsubstantiated.
The feared situations are avoided or endured with intense fear.

30 participants met the inclusion criteria. 13 participants experienced all symptoms, 17 participants exhibited all symptoms, except ‘impairment of daily life’. The DSM IV criterion of ‘impairment in daily life’ was not a necessary condition for inclusion into the anxious group. Participants in the non-anxious group that exhibited any of the symptoms were excluded from the study. Further exclusion criteria to the study were panic disorder, agoraphobia, general anxiety disorder, obsessive-compulsive disorder, post traumatic stress disorder, affective disorder, substance abuse, substance addiction or psychosis as measured by the ICDL. The German version of the LSAS (maximum score 144) was used to asses the severity of the social phobia. Participants indicated their level of fear for 24, potentially fearful, social situation. Participants in the anxious-

group had to display a score of at least 27, whereas participants of the control-group had to display a score of 13 or below. Participants were paid 5€ per hour for their participation in the study (about two hours).

Selection of video material

Four videos were excluded because the researchers failed to maintain the condition (participants fiddled with a pen or were allowed to retain their notes). One video was excluded because the participant seemed informed about the context of the study. 52 videos were used in the final analysis. 26 participants were part of the social anxiety group (mean age 20.65 (2.04)) and 26 participants were part of the control group (mean age 20.64 (2.68)).

For the analysis of the inter-rater reliability 40 of the 52 videos were used, that had not been watched by the raters previously (in the pilot-study). The distribution of the groups was not equal, with 23 participants in the control condition and 17 participants in the social anxiety condition. Age did not differ significantly between the groups.

Measures

After a short pilot study (N = 10), it seemed to be most effective to take one general measurement of anxiety per video and measurements of nine specific behaviors.

General anxiety. First, the general level of anxiety displayed by participants was scored once in order to minimize transfer from the other categories. The scale went from 1 (not anxious) to 5 (extremely anxious). For the final score the mean of the two raters was used.

Specific anxiety behaviors. All specific behaviors (Table 2) were scored in 15 second intervals. Each specific behavior was judged to be either present or absent within each interval, the raters decided in which order to score the behaviors. After reviewing the critical (mismatched) intervals, a final score for every video was discussed between the two raters. The final score ranges from 0 (the specific behavior did not occur in any interval) to 1 (the specific behavior did occur in all intervals). The following specific behaviors were assessed, for further description please see the list of parameters (Attachment 1, Definitieve parameters).

Table 2

Specific Anxiety Behaviors assessed

Physical	tense posture
	agitation
	fumble/self-manipulation
	feet movement
Social	(trying to initiate) non-verbal contact
	(trying to initiate) verbal contact
	looking to the experimenter
	laughing
Other	discontinuation of the speech

Procedure

Participants that matched the criteria were called and an individual appointment was made, they were not told about the goal of the experiment. This experiment was part of a prolonged experiment, that took about 2 hours; at the time of the video recording participants had already completed different tasks for approximately 1 ½ hours. The study was conducted in a bright 3*5m room by two trained experimenters. Participants were briefed precisely about the free speech task, they were asked to imagine a job interview and being asked to give a short summary of their study in two minutes. This also included naming problems and suggestions for improvement. Participants had two minutes to prepare the talk and were allowed to make notes in that time. They were not allowed to keep the notes (or any other object) during the free speech task. Once preparation time was over, the participants were instructed to stand two meters in front of the camera and begin to talk when given a sign by the experimenter. Time was recorded with a stopwatch by the experimenter, who also gave the stop sign after two minutes.

The videos were scored by two trained raters independently and final scores for the specific anxiety behaviors were obtained in discussion. Final scores on the general anxiety measurement were computed as the mean of the ratings given by the two raters. Inter-rater reliability on the specific ratings of anxiety behavior was computed dividing the total number of 15-second intervals agreed upon by the raters, by the total number of intervals. Inter-rater reliability was good and ranged from 0.84 to 0.98. Inter-rater reliability of the general measurement of anxiety was computed

using Pearson's two tailed correlation test. This inter-rater reliability was low (r = 0.53). The correlation of the general measurement with the specific measurements of anxiety behavior was assessed in the same way. A one-way ANOVA was used to test for significant differences in the specific ratings of anxiety behavior between the social fearful and the control group, factor analysis of the specific ratings of anxiety behavior was conducted using a rotated component matrix (Principal Component Analysis, Varimax with Kaiser Normalization).

Results

General anxiety

The correlation of the general anxiety measures (5 point Likert scale) between the two raters was only 0.53 and thus did not meet the required inter-rater reliability of 0.80. The mean general anxiety score was 2.75 (1.4), with no significant differences between the two raters ($p > .1$). The measurement of general anxiety correlated significantly with three other factors: laughing (r = .5), looking to the experimenter (r = .4) and non-verbal communication (r = .3). Given the low inter-rater reliability those correlations have to be interpreted with caution.

Specific anxiety behaviors

Analysis revealed a high reliability for specific anxiety behavior items, ranging from 0.84 to 0.98. Fumbling/self-manipulation was the only factor to reach significance ($F(1.50) = 5.11$, $p = .03$, $eta^2 = 0.1$), comparing the anxious and the non-anxious control group.

Table 3
Inter-rater Reliability of the Specific Ratings of Anxiety Behavior

Specific Ratings of Anxiety Behavior	Inter-rater reliability
Non-verbal contact	r = .93
Looking to the experimenter	r = .89
Laughing	r = .95
Tense posture	r = .84
Agitation	r = .94
Fumbling /Self-manipulation	r = .88
Feet movement	r = .88
Verbal contact	r = .98
Discontinuation of the speech	r = .93

Construct validity

The goal of the Free Speech Task is to create stress through exposing the participant to a socially fearful situation, in order to observe the behavioral strategies. The measurements of the observed behaviors can be seen as the outcome of these behavioral strategies. It is possible to group the observed behaviors according to a behavioral strategy. Factor analysis showed three factors with an eigenvalue greater than one. The logical cluster of distribution for the rotated component matrix can be interpreted as three distinct strategies for dealing with stress. Factor one comprises social interaction items, such as looking to the experimenter. Another way of dealing with stress is to release it into movement. The items of factor two, agitation and feet movement, are examples of external physical release. Factor three consists of only one item, fumbling/self-manipulation, which also depicts a physical, but more internal way of dealing with the stress (see Table 4).

Table 4
Rotated Component Matrix of Specific Ratings of Anxiety Behavior (PCA)

	Component		
	1	2	3
looking	,847	,161	-,203
laughing	,640	,054	,247
tense	,116	-,562	-,266
agitation	,180	,680	,054
fumble	,040	,095	,890
feet movement	,011	,850	-,134
non-verb. contact	,830	,049	-,021
verbal contact	,618	-,020	-,305
discontinuation	,815	-,098	,252

Discussion

The goal of this study was to develop a behavioral assessment with maximal inter-rater reliability and sensitivity to social anxiety in the Free Speech Task. Two minute videos of anxious participants and non-anxious controls were rated for a general measurement of anxiety and nine specific anxiety behaviors. We expected that the anxious and non-anxious participants would show differences in behavior. We also expected that the specific rating of anxiety behaviors are correlated with each other and that they are correlated with the general rating of anxiety.

Inter-rater correlations of the specific ratings of anxiety behavior were excellent, but inter-rater reliability of the general rating of anxiety did not meet the required standards. Factor analysis revealed clustering of the specific ratings of anxiety behavior into three factors: social behavior,

internal physical behavior and external physical behavior. The specific rating of fumbling/self-manipulation was found to differ significantly between the social fearful and the control group.

Results of the factor analysis identified three distinct strategies for dealing with the stress induced by the experimental task used, the Free Speech Task. Social anxious and non-anxious participants differed in their strategy with regard to the internal physical behavior. Socially anxious people engage significantly more in fumbling/self-manipulation than non-anxious people. The effect can be reliably measured, the effect size is moderate. However, the two groups did neither show significant differences for anxiety behaviors related to the strategy of social interaction nor did they show significant differences for anxiety behaviors related to the strategy of external physical behavior. This has important implications for the behavioral assessment of social anxiety, the focus in these assessments should be directed to the internal physical behavior. Only one behavior assessed in this study could be related to internal physical behavior. Further research should aim to develop ratings of more diverse behaviors related to internal physical behavior.

The measurement of general anxiety failed to produce relevant correlations between the two raters, however the pattern of correlations with “laughing”, “looking to the experimenter” and “non-verbal communication” seems to indicate that the (subjective) general rating of anxiety by the observers was based mostly on criteria of social interaction. This is puzzling as in other studies the measurement of general anxiety correlated highly with another behavior assessment scale, the Social Performance Rating Scale (Fydrich et al., 1998). Concerning the view of Mauss, Wilhelm and Gross (2004) the question whether anxiety behavior can be observed, might be more a question of defining the categories used to assess anxiety behavior.

Since the focus of this study was to maximize the inter-rater reliability, the videos were rated in intervals of 15 seconds. It might be possible that the rating intervals were too long and therefore insensitive to differences. Furthermore a ceiling effect might have occurred, because repeated anxiety behavior during a 15 seconds interval was only scored once. Some behavior might occur normally in a slightly stressful situation for most people and the method used in this study is not capable to differentiate between qualitative differences in these behaviors. Another point is that the distribution of anxious behavior might also differ over time. It is possible that anxious people show more stress related behavior as the task goes on, because tension is mounting. The used method did not allow including time as a factor into the analysis and the actual Free Speech Task was also relatively short (two minutes).

One shortcoming of this study is that experimenter reactivity differed between subjects. Sometimes the experimenter stayed out of sight during the Free Speech Task, in other instances eye contact was made easily. Moisan-Thomas, Conger, Zellinger and Firth (1984) found that participants appeared more anxious when interacting with a minimally responsive confederate than when interacting with a moderately responsive one. It is likely that experimenter responsiveness is not random and possibly related to group membership. Stricter protocols on experimenter behavior should be introduced in following studies, for example the seating of the experimenter should always be at the same place in order to control for differences in possibilities of eye contact.

Although further research is needed, it does not seem that there are very clear behavioral indicators for anxiety. Much of the behavioral observations failed to prove their explanatory value. Future studies exploring the mechanism of interaction between anxiety cognition and anxiety behavior will give a clearer picture of the correlations between physiology, cognition and behavior. These studies should employ different behavioral assessments of anxiety and experimenter behavior should be scripted. Ultimately, the fact that social anxiety cannot be reliably measured by behavioral indicators might benefit those individuals with social anxiety and help them to overcome their anxiety.

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Attachment 1

Definitieve parameters (Dutch)

Parameters	Toelichting
Algemene indruk angst	1: geen enkele aanwijzing angst, pp is zeer kalm 3: middelmatig angstig 5: zeer angstig
Kijken	Aankijken van proefleider (alleen scoren wanneer er ook echt naar de proefleider wordt gekeken). 'Altijd' scoren wanneer dit te zien is. Niet scoren wanneer de positie van de proefleider niet te zien is en alleen het vermoeden bestaat dat dit gebeurd.
Lachen	Alleen scoren wanneer dit te horen is. Doordat er veel nerveus gelachen wordt, zal er meestal geen duidelijk lachgeluid gehoord kunnen worden. Scoor daarom ook de minder duidelijk te horen lachgeluiden. .
Lichaam	Duidelijk aanwezige gespannen houding (armen bewegingsloos langs het lichaam, weinig beweging, stijf, gebalde vuisten, opgetrokken schouders)
	Wiebelen met hele lichaam. (deelnemer beweegt onnodig heen en weer met hele lichaam). Niet scoren bij twijfelgevallen, het moet duidelijk te zien zijn.
	Zelf-stimulatie (ook friemelen alleen vingers, wrijven met handen tegen elkaar, friemelen aan broek, ook wanneer er 1 hand achter de rug gehouden wordt). Alleen scoren wanneer dit goed te zien is. Niet wanneer alleen het vermoeden bestaat dat het gebeurd (handen in mouwen, broekzak of achter de rug) en ook niet wanneer iemand steun aan het zoeken is voor zijn handen/armen.
	Voetbewegingen waarbij steunpunt hele lichaam veranderd (ook gedeeltelijk schuiven van de voet; ook scoren wanneer voet op dezelfde plaats blijft staan, maar deelnemer tijdelijk op 1 kant van de voet gaat staan (b.v.

	alleen op de hak/ 1 zijkant van de voet). Alleen scoren wanneer er een redelijk duidelijke beweging te zien is. Niet scoren na de start van de hartslagmeter (scoor het ook niet als deelnemer onnodige bewegingen maakt bij het zoeken van een vaste stapositie).
Contact hebben met proefleider	Op niet-verbale wijze contact zoeken/ hebben met proefleider. Ook scoren wanneer eventueel uitgesproken woorden geen samenhang vormen met elkaar en deze niet duidelijk gericht zijn op interactie met de proefleider. Ook scoren wanneer deelnemer zijn verhaal aan het vertellen is en daarbij de proefleider zo aankijkt dat het lijkt alsof de deelnemer contact zoekt.
	Op verbale wijze contact zoeken/ hebben. (er wordt bv. een vraag gesteld aan de proefleider gericht op interactie met de proefleider). Wat er gezegd wordt, hoort niet bij het verhaal dat de deelnemer in de camera hoort te vertellen. Wanneer de proefleider het contact geïnitieerd heeft en de deelnemer daarop niet reageert met de bedoeling het contact voort te zetten wordt er niets gescoord. Gaat de deelnemer echter vragen stellen of iets anders zeggen om het contact te behouden wordt het wel gescoord. Niet scoren wanneer deelnemer iets zegt wat niet bij het verhaal hoort, maar wat ook niet gericht lijkt te zijn aan de proefleider (b.v. de deelnemer kijkt in de camera en zegt ‘wat zal ik nu zeggen’). Ook scoren wanneer deelnemer in eerdere periode al verbaal contact heeft gezocht/gehad en dat in nieuwe periode weer zoekt/heeft. (Omdat dit duidt op afwezigheid sociale angst, zal dit omgekeerd gescoord moeten worden.)
Onderbreking verhaal	Er vindt een onderbreking van het verhaal plaats. Verbaal of non-verbaal wordt duidelijk dat de deelnemer (tijdelijk)

	gestopt is met het vertellen van zijn verhaal. De deelnemer geeft bijvoorbeeld aan echt niet meer te weten wat hij zou kunnen zeggen. Niet scoren wanneer de deelnemer slechts kort overweegt wat hij zou kunnen zeggen en daarna weer verder vertelt.

Opmerkingen

- Het scoren van algemene indruk angst moet als eerste gebeuren om de transfer zo klein mogelijk te houden.
- Algemene indruk van angst wordt per video slechts eenmaal gescoord.
- Alles wat in een periode van 15 sec. te zien is, moet gescoord worden ongeacht wat er in een eerdere, dezelfde of latere periode wel of niet gescoord wordt.
- Als duidelijk is dat deelnemer van de proefleider moet/mag stoppen: niets meer scoren, want gedrag daarna hoort niet meer bij de opdracht. Let op: wanneer deelnemers zelf stoppen wanneer de tijd nog niet voorbij is, moet er wel gescoord worden!
- Als iets niet te scoren is, dan wordt er helemaal niets ingevuld.