

Incidence of DSM-IV Social Phobia in a Community Sample of Young German Women

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Abstract

Background: Little is known in regard to the risk factors of social phobia. Longitudinal studies are necessary to identify those factors, and thus to help developing prevention strategies.

Objective: This longitudinal study investigates precipitating risk factors and outcomes of the incidence of DSM-IV social phobia in a large community sample.

Method: A German cohort of 1238 women (18-24 years) at risk for first incidence of social phobia completed a diagnostic interview and self-report questionnaires at two survey points approximately 15 months apart.

Results: The estimated first incidence rate of DSM-IV social phobia was 4.2/100/year. Significant risk factors of the incidence of social phobia were not having a romantic partner, sub-threshold social phobia at baseline, higher interpersonal sensitivity, higher avoidance behavior, more dysfunctional attitudes and lower self-efficacy. Previous psychiatric disorders did not predict social phobia. At follow-up, social phobia was associated with comorbidities and major psychosocial problems.

Conclusions: Young adult women are vulnerable to develop social phobia and psychological predictors play a major role in the development of social phobia. The development of social phobia might be a marker of a beginning "psychiatric career" (German J Psychiatry 2011; 14: 80-90).

Keywords: incidence, social phobia, anxiety disorder, risk factors, epidemiology

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Introduction

Large epidemiological studies, showing that social phobia is highly prevalent (Acarturk et al. 2008; Gren-Landell et al. 2009; Ruscio et al. 2008; Stein et al. 2000; Tillfors & Furmark 2007; Wittchen et al. 1999) and associated with enormous personal and functional impairment as well as societal costs (Patel et al. 2002), suggest that there is a serious need for broader prevention efforts for social phobia. Such efforts can only be improved by the identification of risk factors, for which incidence studies are needed (Kraemer et al. 1997). Prevalence data are less suitable for that purpose, because the underlying cross-sectional

designs cannot pinpoint the causal direction of associations between the involved variables. To our knowledge, only a few community studies tested their participants on potential risk factors already before the incidence of social phobia took place (Goodwin et al. 2004; Karlsson et al. 2010; Neufeld et al. 1999). In the Epidemiological Catchment Area Program (ECA) participants with a major depression, dysthymia or panic disorder were more likely to develop a DSM-IV social phobia in the following 13 years than those without these pre-existing disorders (Neufeld et al. 1999). Demographic variables were not related to the incidence of social phobia. The Early Development Psychopathology Study (EDPS) found that baseline panic attacks predicted the incidence of social phobia within the following five years (Goodwin et al. 2004). In Karlsson et al. (2010), who investi-

gated the development and prediction of social phobia in elderly over a period of five years, social phobia was not significantly predicted by having social fears at baseline, but by being younger. In sum, studies investigating incidence rates of social phobia in the community are rare. Most of these studies include no or only a few predictors of the incidence of social phobia.

According to etiological models of social phobia (Beck & Emery 1985; Clark & McManus 2002; Clark & Wells 1995) next to predisposing factors (e.g. genetics) precipitating psychological factors (e.g. dysfunctional attitudes, self-esteem) predict the development of social phobia. The well-designed Netherlands Mental Health Survey and Incidence Study (NEMESIS) shows that psychological factors (e.g. neuroticism, low self-esteem) play an important role in the development of anxiety disorders (De Graaf et al. 2002). However, this study did not focus on social phobia, it just looked at all anxiety disorders together, although there are impressive differences in the etiology of different anxiety disorders. To our knowledge no study examined such psychological potential risk factors for the incidence of social phobia in the community.

The present community based incidence study fills this gap of studies investigating predictors of the incidence of social phobia. It uses a longitudinal design and evaluates the diagnostic status of a large cohort of young women at two points in time. It investigates the incidence of DSM-IV social phobia and a broad scope of potential predictors of social phobia. These potential predictors are of three kinds: 1) socio-demographic predictors, 2) other psychiatric disorders and 3) psychological and social predictors. Moreover, we aim at gaining information about potential psychological risk factors for the incidence of social phobia. Further, we investigate the comorbidity and associations with psychological factors with the incidence of social phobia at follow-up.

Methods

The data presented here were derived from the Dresden Predictor Study (DPS). As detailed elsewhere (Maercker & Herrle 2003; Trumpf et al. 2009; Vriends et al. 2007), the DPS was a prospective epidemiological study designed to collect data on the prevalence, incidence, course, and risk factors of certain mental disorders in young women aged 18-24 years at baseline. This age range was chosen because many mental disorders, especially the majority of anxiety disorders as well as depression, have their first onset at a fairly young age at the beginning of young adulthood. Only women were chosen for the study sample of the DPS because prevalence and incidence rates of anxiety disorders and depression in women are usually twice as high as in men. Furthermore, men are likely to have quite different risk factors, a joined analysis would therefore be impossible. In the DPS a representative sample of young women in Dresden took part in a baseline survey and in one follow-up. At each survey point a diagnostic interview and self-reported questionnaires were completed. Dresden is a city of 480,000

people, located in the former German Democratic Republic (GDR, or East Germany).

Participants

The DPS sample (described in detail in Trumpf et al. (2009)) was randomly drawn from the 1996 official population register of all female residents between 18 and 24 years-of-age in Dresden. In Germany this normally includes all residents, because every person is required to register. At baseline a representative sample of 1877 young women in Dresden completed an individual diagnostic interview according to the DSM-IV criteria and self-reports questionnaires. The response rate at this first wave was 59%. This relatively high rate of non-responders must be seen in the light of time and place of the survey. In the former GDR there was distrust to governmental issues at the time the study took place (Maercker & Herrle 2003). At the follow-up survey an average of one and a half years later ($M = 1.3$ yrs; $SD = 0.3$ yrs; range = 7-30 months) 1396 women took part, indicating a response rate of 74% relative to baseline.

For the present study we used the sample of the 1238 women, who were at risk for first incidence of social phobia. Persons at risk for a first incidence of social phobia are those, who have never experienced social phobia up to and including baseline. The average age at baseline of this sample was 22.8 years ($SD = 1.8$), 64 % had highest education, about half of the women had a job and almost two thirds were of a middle socio-economic status (SES) (63%). Low SES was reported by 28% of the women and high SES was rare (9%). 64% had a romantic partner, 24% lived together with a romantic partner and 7% were married.

Procedure

The sample was selected from the government register and received a letter with detailed information about the purpose, organization and design (interview, questionnaires and longitudinal survey) of the DPS. The interviewers invited interested participants to a diagnostic interview, which measured social phobia and other psychiatric disorders. The mean duration of this interview was 114 min (range: 30-330 minutes). The participants filled out the self-report questionnaires including the individual social and psychological measures (see 2.3.3) directly after the interview. If the interview took a lot of time, the participant could fill out the questionnaires at home and return them by mail. At the end of the first diagnostic interview the participants were asked if they were willing to take part in a second diagnostic interview one year later.

An average of 1.3 years later another interviewer that was unaware of the outcome of the first interview invited the participants for the second interview by telephone, letter or personal contact. The mean duration of this interview was 76 min (range: 15-270 minutes). The participants filled out the questionnaires directly after the interview.

Measures

DSM-IV Diagnoses and socio-demographic data

The diagnostic assessments at baseline and follow-up were based on the “Diagnostisches Interview für Psychische Störungen – Forschungsversion” (F-DIPS, translation: Research Diagnostic Interview for Psychological Disorders). The F-DIPS is the German version of the Anxiety Disorders Interview Schedule (ADIS-IV-L, DiNardo et al. 1995) which is a structured interview allowing the assessment of symptoms, syndromes and diagnoses of clinical anxiety disorders (axis I) according to DSM-IV. Details about retest- and inter-rater reliability of the F-DIPS can be found in Trumpf et al. (2009).

Interviewers were either psychology students in their last year of training or medical doctors. All underwent an intensive training of about 1 week and subsequently attended supervision meetings every 2 weeks. Trained doctoral-level supervisors examined every interview. Unclear cases were discussed and a consensus diagnosis was given. A diagnosis of a psychological disorder measured by F-DIPS was assigned if all DSM-IV criteria were satisfied.

Social phobia

The social phobia section of the F-DIPS was assessed if the participant affirmed to feel anxious or nervous in performance or social interaction situations or if the participant worried extremely that he/she would say or do something that could be judged negatively by others. The interviewer asked the participant about the degree of his/her own fear and avoidance of 13 social situations and rated the answer on a scale of 0 (no fear/avoidance) to 8 (very strong fear/always avoidance). Fear or avoidance of a situation was rated as clinically relevant if the score was 4 or higher. If the participant avoided one or more social situations to a clinically relevant degree the interviewer asked if this/these situation(s) almost invariably provoke(s) anxiety when entered, if the participant thinks that this fear is excessive or unreasonable and how much the participant felt impaired because of the social phobia. To assess impairment due to social phobia the interviewer asked (translation) “Are you impaired in your life by these fears? How much impairment do you experience in your life (for example in your daily routine, work, social activities)? Is your actual work or education, in particular, influenced by your social fears?” The interviewer then rated the answers on a scale of 0 (not at all) to 8 (very much). Finally, the participants were asked to disclose any excluding symptom criteria (e.g. drug misuse, medication). According to the answers of this section of the interview *Social phobia* was defined as fulfilling all criteria of DSM-IV social phobia. *Sub-threshold social phobia* was defined as fulfilling more than three criteria of DSM-IV social phobia but not all of them.

Individual social and psychological measures

The individual social and psychological factors were measured at baseline and at follow-up by the following self-report questionnaires:

Psychopathology: The German version of the “Symptom Checklist 90 – Revised” by Franke (SCL-90-R; Derogatis & Cleary 1977; Franke 1995) measured psychopathology. This 90 items questionnaire with 5-point Likert scale answers is divided into 9 subscales (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism). The German version of the SCL-90-R has good internal consistency ($\alpha = .74 - .97$) and good test-retest reliability ($r = .69 - .92$) (Franke 1995; Franke et al. 2002).

Neuroticism: The 14 items “Emotionalität” (translation: emotionality) scale of the Revised Freiburg Personality Inventory (FPI) (Fahrenberg et al. 1989) measured neuroticism. The participant scored the items on a 4-point Likert scale. The sum score was used.

Avoidance behavior: The “social phobia” subscale of the Fear Questionnaire (Marks & Mathews 1979) measured avoidance of 5 social situations (drinking or eating with others, being observed, talking to an authority person, being criticized, public speaking). The participants scored the situations on a scale from 0 “I never avoid this situation” to 8 “I always avoid this situation”. The Fear Questionnaire has good internal consistency and test-retest reliability (e.g. Oei et al. 1991).

Dysfunctional attitudes: The German translation of the 40 items “Dysfunctional Attitudes Scale” (DAS; Beck et al. 1991; Weissman 1979; Weissman & Beck 1978) measured stable cognitive schemas associated with depression (Beck et al. 1991), e.g. “I should be happy all the time” and “My life is wasted unless I am a successful”. Responses vary from 0 “total agreement” to 6 “total disagreement”. For this study we used the total sum score. The DAS has good internal consistency for females and males and good test-retest reliability (e.g. Dobson & Breiter 1983).

Anxiety sensitivity: The “Anxiety Sensitivity Index” (ASI; Reiss et al. 1986) measured fear of anxiety symptoms (including both cognitive and somatic sensations) arising from the belief that these symptoms will have consequences that are socially, physically or psychologically harmful. The participant scored 16 items on a 4-point Likert scale. The ASI has good internal consistency in clinical and non-clinical populations and good test-retest reliability (e.g. Ehlers & Margraf 1993).

Mental health: A 14 items “Seelische Gesundheit” (“mental health”) scale of the Marburger Health Study (Beck et al. 1991; Lutz et al. unpublished) measured positive mental health (item examples: (translation) “I come to grips with the things in my life that are not changeable”, “I feel loved and understood by people that I consider as important” and “I believe that my life has a meaning”). The participant scored these items on a 4-point Likert scale from 0 “not true” to 3 “true”. For this study we used the sum score of the 14 items.

Self-efficacy: The 10 items questionnaire (Bandura 1977) measured optimistic beliefs based on the concept of self-efficacy, a sense of ability to carry out particular actions (e.g. "I will find a solution for every problem"). Scores vary from 0 "low self-efficacy" to 30 "high self-efficacy". This questionnaire has good internal consistency ($\alpha = .74 - .92$) and test-retest reliability ($rtt = .47$ (for men), $rtt = .63$ (for women)) (Schwarzer 1994).

Life satisfaction: A questionnaire with 12 items (Lebenszufriedenheitsfragebogen, LZH; Lutz et al. unpublished) measured life satisfaction in important life areas. The participant rated each area on a scale from 0 "very unsatisfied" to 4 "very satisfied".

Social support: The German Social Support Scale, short version (SOZU-K-22, Soziale Unterstützung, Kurzform; Fydrich et al. 1987) measured social support. This questionnaire includes items about emotional support, instrumental support and social integration, e.g. "I often feel I am an outsider" or "There are persons, to whom I can show all my feelings without feeling embarrassed". The participant scored his or her agreement at scale from 0 "that does not apply to me" to 4 "that does exactly apply to me". The SOZU-K-22 has good internal consistency ($\alpha = .79 - .92$) and moderate test-retest reliability ($rtt = .52 - .65$).

Data analyses

Definitions

First incidence is defined as the number of new cases between the two interviews divided by the total number of "person-years at risk"¹ at baseline (Hennekens & Buring 1987; Rothman 1998). In calculating incidences one can assume that the average point at which new cases emerge lies halfway through the period between baseline and follow-up (cf. Eaton & Anthony 1989). We therefore calculated the number of person-years at risk in incident cases including half of the time elapsed between the baseline and follow-up diagnostic interview with the participant in question. The *cumulative incidence* rate covers the new cases of the whole period between baseline and follow-up.

We aimed at identifying predictors of the incidence of social phobia and associations with the presence of social phobia in young women. These predictors were of three kinds: 1) socio-demographic predictors, 2) other psychiatric disorders and 3) psychological and social predictors. *Lifetime prevalence* rate at baseline denotes the rate of the disorder and covers the respondents' lifetime period prior to baseline assessment. *Point prevalence* rate at baseline refers to the percentage of persons having the disorder within the respondents' seven days period prior to assessment. *Comorbidity* at follow-up refers to psychiatric disorders that are present within the

respondents' seven days prior to and up to the follow-up assessment.

Statistical analyses

Logistic regression analyses including odds ratios plus confidence intervals (CI) were used to describe the association between potential predictors at baseline and first incidence of social phobia. Each predictor variable was analyzed separately in a univariate analysis. Analyses including socio-demographic and psychological variables as predictors of first incidence of social phobia were adjusted for sub-threshold social phobia at baseline.

We treated the ordinal variables 'education', 'employment' and 'socio-economic status' (SES) as interval variables as they represent a scale from low to high. Further, we translated the interval variables of the individual social and psychological measures into z-scores to make comparison of the strength of the odds ratios easier.

Results

Incidence rates

Of the 1238 individuals who had never had a DSM-IV social phobia up to and including baseline, 66 developed social phobia for the first time during the 1.3 years between baseline and follow-up, indicating a cumulative incidence rate of 5.5%. Based on person-years at risk, the estimated annual incidence of DSM-IV of the total population was 4.2 / 100 person-years. Within the incidence group, 25 individuals (38.5%) fulfilled a sub-threshold social phobia at baseline.

Prediction of the incidence of social phobia

Associations between psychiatric disorder prevalence rates and first incidence of social phobia

Baseline sub-threshold social phobia and baseline point prevalence of major depression significantly predicted the incidence of social phobia (OR = 4.21 (95% CI 1.39 - 12.73) and OR = 3.79 (95% CI 2.35 - 6.01), respectively). Other point prevalence and lifetime prevalence rates of psychiatric disorders at baseline did not significantly predict the first incidence of social phobia (all p 's > .05)².

Socio-demographic predictors

Table 1 presents the odds ratios for the socio-demographic predictors of the first incidence of social phobia. These analyses are controlled for a sub-threshold of social phobia

¹"Person-years at risk" is here the period of time in years between the baseline and follow-up diagnostic interviews, which is computed for each participant individually.

²Values of the analyses can be requested from the corresponding author.

Table 1. Socio-demographic predictors of first incidence of social phobia

| Variable | New onset SP | No SP | New onset SP vs. no SP | |
|-----------------------------|---------------|-----------------|------------------------|--------------------|
| | (N = 66) % | (N = 1172) % | OR* | 95% CI |
| No romantic partner | 55.5 | 35.4 | 2.06 | 1.24 - 3.42 |
| Education | | | 1.05 | .77 - 1.43 |
| No degree | 3.0 | 3.8 | | |
| Lowest | 3.0 | 2.1 | | |
| Middle | 25.8 | 29.9 | | |
| Highest | 68.2 | 64.2 | | |
| Employment | | | 1.04 | .77 - 1.39 |
| Not working | 56.1 | 50.2 | | |
| Part time | 13.6 | 20.0 | | |
| Full time | 30.3 | 29.8 | | |
| Socio-economic status (SES) | | | .70 | .45 - 1.09 |
| Low SES | 36.9 | 27.1 | | |
| Middle SES | 55.4 | 63.4 | | |
| High SES | 7.7 | 9.5 | | |

Note. SP = Social Phobia; OR = Odds Ratio; CI = Confidence Interval

*All analyses were adjusted for sub-threshold social phobia at baseline.

Odds ratios that are significantly different from 1 at alpha=0.05 are denoted by bold typeface

at baseline. While ‘not having a romantic partner’ at baseline predicted the first incidence of social phobia, socio-economic status, education, and employment status did not (see Table 1).

Individual social and psychological predictors

Table 2 presents the odds ratios for the psychological and socio-environmental predictors of the first incidence of social phobia. These analyses are controlled for sub-threshold social phobia at baseline. First incidence of social phobia was predicted by more interpersonal sensitivity, more avoidance of social situations, more dysfunctional attitudes and lower self-efficacy.

Cross-sectional associations with social phobia

Associations between social phobia and psychiatric disorders at follow-up

In Table 3 the association between point prevalence rates at follow-up of other mental disorders and the presence of social phobia are presented. At follow-up the presence of social phobia was significantly associated with other psychiatric disorders in general and specifically with anxiety disorders, affective disorders and somatoform disorders (see

Table 2. Psychological and socio-environmental predictors of first incidence of social phobia

| Variable | New onset SP | No SP | New onset SP vs. no SP | |
|--------------------------------|--------------------|----------------------|------------------------|--------------------|
| | (N = 66) M (SD) | (N = 1172) M (SD) | OR* | 95% CI |
| Psychopathological scales | | | | |
| Somatization | .40 (.36) | .31 (.31) | 1.18 | .97 - 1.45 |
| Compulsivity | .49 (.43) | .39 (.39) | 1.15 | .92 - 1.44 |
| Interpersonal sensitivity | .61 (.57) | .40 (.43) | 1.29 | 1.05 - 1.57 |
| Depression | .54 (.54) | .41 (.43) | 1.18 | .95 - 1.46 |
| Anxiety | .36 (.44) | .25 (.31) | 1.20 | .98 - 1.40 |
| Hostility | .36 (.44) | .32 (.40) | 1.05 | .83 - 1.33 |
| Phobia | .14 (.21) | .11 (.21) | 1.07 | .86 - 1.34 |
| Paranoid | .41 (.55) | .33 (.44) | 1.08 | .87 - 1.36 |
| Psychotic | .20 (.30) | .16 (.26) | 1.04 | .84 - 1.29 |
| Avoidance of social situations | 9.14 (6.75) | 6.34 (5.38) | 1.37 | 1.09 - 1.71 |
| Neuroticism | 29.34 (6.44) | 28.51 (7.26) | 1.01 | .78 - 1.31 |
| Dysfunctional attitudes | 123.46 (21.33) | 114.57 (22.65) | 1.32 | 1.03 - 1.68 |
| Anxiety sensitivity | 13.39 (7.82) | 12.38 (7.37) | 1.05 | .82 - 1.35 |
| Self-efficacy | 26.72 (4.99) | 28.81 (4.23) | .71 | .55 - .90 |
| Mental health | 44.57 (7.38) | 46.58 (6.07) | .84 | .67 - 1.06 |
| Life satisfaction | 3.62 (.45) | 3.69 (.51) | .93 | .73 - 1.19 |
| Social support | 4.28 (.47) | 4.43 (.49) | .83 | .67 - 1.03 |

Note. SP = Social Phobia; OR = Odds Ratio; CI = Confidence Interval

*All analyses were adjusted for sub-threshold social phobia at baseline. odds ratios that are significantly different from 1 at alpha = 0.05 are denoted by bold typeface

Table 3. Prevalence rates of psychiatric disorders correlated with social phobia

| Variable | Point prevalence at follow-up | | New onset SP vs. no SP | |
|-----------------------------|-------------------------------|--------------------------|------------------------|----------------|
| | SP (N = 66) % | No SP (N = 1172) % | OR | 95% CI |
| Psychiatric disorders total | 15.9 | 89.4 | 44.68 | 20.1 - 99.34 |
| Other anxiety disorders | 13.4 | 89.4 | 54.49 | 24.45 - 121.43 |
| Affective disorders | 1.2 | 4.5 | 3.94 | 1.1 - 14.06 |
| Somatoform disorders | 1.0 | 4.5 | 4.6 | 1.27 - 16.73 |
| Substance use disorders | 0.9 | 1.5 | 1.62 | .21 - 12.77 |
| Eating disorders | 0.8 | 1.5 | 1.99 | .25 - 15.93 |

Note. SP = Social Phobia; OR = Odds Ratio; CI = Confidence Interval

Odds ratios that are significantly different from 1 at alpha = 0.05 are denoted by bold typeface

Table 3). The association between social phobia and eating or substance disorders was not significant.

Individual social and psychological associations with social phobia

The associations between the psychological and socio-environmental variables and the presence of social phobia are presented in Table 4. A DSM-IV social phobia was associated with more psychopathology (all scales significant, except from psychotic and paranoid), more avoidance, more dysfunctional attitudes, more anxiety sensitivity, more neuroticism, lower self-efficacy, lower social support and lower mental health. Thus, social phobia is associated with major psychological and social problems.

Discussion

Principal findings

We found an estimated first incidence rate of 4.2/100/year in young adult women. Sub-threshold social phobia at baseline strongly predicted social phobia at follow-up. Most strikingly, though, socio-environmental and psychological factors proved to be important predictors of the first incidence of social phobia, even when controlled for the presence of sub-threshold social phobia at baseline. Women, who did not have a romantic partner, who had lower self-efficacy, more dysfunctional attitudes and less interpersonal sensitivity and who avoided social situations had an increased risk to establish social phobia. The presence of social phobia at follow-up was associated with a broad spectrum of psychological and social problems, such as other psychiatric

Table 4. Psychological and socio-environmental correlated social phobia

| Variable | SP (N = 66) | No SP (N = 1172) | SP vs. no SP | |
|--------------------------------|----------------|---------------------|--------------|--------------------|
| | M (SD) | M (SD) | OR* | 95% CI |
| Psychopathological scales | | | | |
| Somatization | .41 (.43) | .27 (.29) | 1.36 | 1.14 - 1.63 |
| Compulsivity | .50 (.48) | .29 (.34) | 1.51 | 1.26 - 1.81 |
| Interpersonal sensitivity | .49 (.44) | .29 (.37) | 1.45 | 1.22 - 1.73 |
| Depression | .48 (.53) | .32 (.38) | 1.36 | 1.13 - 1.64 |
| Anxiety | .34 (.52) | .17 (.25) | 1.44 | 1.22 - 1.69 |
| Hostility | .33 (.43) | .23 (.32) | 1.26 | 1.04 - 1.52 |
| Phobia | .14 (.22) | .17 (.) | 1.24 | 1.06 - 1.45 |
| Paranoid | .28 (.32) | .21 (.34) | 1.17 | .95 - 1.43 |
| Psychotic | .14 (.21) | .10 (.19) | 1.17 | .98 - 1.41 |
| Neuroticism | 28.89 (7.30) | 26.67 (7.0) | 1.35 | 1.07 - 1.70 |
| Avoidance of social situations | 9.87 (6.45) | 5.26 (5.03) | 1.94 | 1.58 - 2.38 |
| Dysfunctional attitudes | 121.09 (23.70) | 109.74 (22.59) | 1.58 | 1.25 - 1.99 |
| Anxiety sensitivity | 14.56 (8.33) | 10.54 (7.52) | 1.52 | 1.24 - 1.86 |
| Self-efficacy | 26.58 (4.53) | 29.52 (4.09) | .52 | .42 - .66 |
| Mental health | 44.74 (7.93) | 47.51 (5.66) | .67 | .54 - .83 |
| Life satisfaction | 3.67 (.46) | 3.79 (.50) | .80 | .63 - 1.01 |
| Social support | 4.39 (.42) | 4.54 (.44) | .77 | .63 - .94 |

Note. SP = Social Phobia; OR = Odds Ratio; CI = Confidence Interval

*All analyses were adjusted for sub-threshold social phobia at baseline.

Odds ratios that are significantly different from 1 at alpha = 0.05 are denoted by bold typeface.

disorders, lower social support, more psychopathology and less mental health. These findings indicate that social phobia is a prevalent and serious problem in young women that probably has a graduate onset.

Incidence rates

Studies with older community samples revealed lower incidence rates compared to the present incidence rate. The Epidemiological Catchment Area Program (ECA) reported an average incidence rate of 0.94% for DSM-III social phobia after one year (Wells et al. 1994) and 5.4% after 13 years (Neufeld et al. 1999). The Netherlands Mental Health Survey and Incidence Study (NEMESIS) reported 1.1% incidence of DSM-IV social phobia in women and 0.8% in men in one year (Bijl et al. 2002). In the Early Development Psychopathology Study (EDSP) with a younger community sample (14 to 24 years at baseline) 2.8% developed a social phobia within four years (Müller 2002), indicating an average rate of incidence of 0.7% per year. Several reasons may account for the higher incidence rate of social phobia of the DPS. First, using DSM-IV criteria lead to somewhat higher prevalence rates than DSM-III criteria. Second, women have a higher risk than men to develop social phobia (Bijl et al. 2002; Wells et al. 1994). Third, the diagnosis of DSM-IV social phobia is met only if the individual experiences impairment because of the social fear(s), avoidance or anxiety in anticipation of encountering the social or performance situation (APA 1994). Naturally the severity of impairment fluctuates with life stressors and demands. In our young adult population individuals enter workplace or continue further education and have to establish themselves in these new social situations. This turbulent life stage could explain higher first incidence rates of social phobia because under these circumstances avoidance and fear in social situation are more likely to produce distress, interference and impairment in life. Fourth, in our study we diagnosed social phobia with a broader range of social situation probes (13 probes) than in previous studies. With fewer investigated social situations (Wells et al. 1994) fewer individuals with social phobia might be revealed as well. Finally, there has always been found major locational differences in prevalence rates of social phobia (see review of (Stein et al. 2010)). Thus it might be assumed that this specific location of Dresden, a former town in East Germany, might have contributed to this high incidence rate, as Dresden was undergoing massive construction and political changes related to the German reunification in 1990.

Predictors of social phobia

With respect to psychiatric history we found that lifetime and baseline sub-threshold social phobia strongly predicted the first incidence of social phobia. Obviously, social phobia develops gradually over time. Other psychiatric disorders up to and including baseline, however, did not predict first incidence of social phobia. This result fits well to the findings that social phobia often precedes other psychiatric dis-

orders (Beesdo et al. 2007; Fehm et al. 2008; Lecrubier & Weiller 1997; Schneier et al. 1992).

In line with other incidence (Wells et al. 1994) as well as prevalence studies (Davidson et al. 1993; Lampe et al. 2003; Magee et al. 1996) we found that 'not having a romantic partner' predicted the incidence of social phobia. However, individuals with social phobia also showed to have disease-specific impairments in romantic relationships (e.g. Schneier et al. 1992; Wittchen et al. 2000). In general, our found associations do not necessarily imply a causal relationship in one or the other direction (only showing that the predictor preceded the development of social phobia), as they are not manipulated. Probably a reciprocal causal association exists between 'not having a romantic partner' and social phobia. Social phobics may be less attractive because of their socially anxious behavior and thereby decrease the chance to find a romantic partner. Our finding, that 'not having a romantic partner' increased the risk for social phobia even when it was controlled for sub-threshold social phobia, makes it, however, plausible that this factor predicted the development of social phobia.

Regarding psychological predictors, we found support for cognitive theories of social phobia. According to these models cognitions play a central role in the development and maintenance of social anxiety disorder (Beck et al. 1991; Clark & McManus 2002; Clark & Wells 1995; Rapee & Heimberg 1997). Indeed low self-efficacy and more dysfunctional attitudes predicted the incidence of social phobia even after adjustment for sub-threshold social phobia at baseline. The association between dysfunctional beliefs people hold about themselves and social anxiety has been previously clearly shown in the National Comorbidity Study (Cox et al. 2004) and in experimental studies (see Hirsch & Clark 2004 for an overview). Though, as far as we know we are the first to show this association in a prospective incidence study, indicating that dysfunctional beliefs in fact predict the incidence of social phobia.

Avoidance of social situations at baseline was associated with the incidence of social phobia after adjustment for sub-threshold social phobia. As avoidance behavior is one of the main features of social phobia (APA 1994), this result again suggests a gradual onset of social phobia. Thus, in the time before the development of social phobia, persons show some symptoms, such as avoidance of social situations, already without fulfilling the other DMS-IV criteria of social phobia.

Incidence of social phobia was further predicted by interpersonal sensitivity even after adjustment for sub-threshold social phobia at baseline. This result is consistent with previous findings on interpersonal sensitivity (Harb et al. 2002) and the analogous concept of shyness (Cox et al. 2005; Heiser et al. 2003). Individuals with interpersonal sensitivity fear to be rejected or observed and are shy in contact with potential romantic partners and have the feeling that others do not like them, which is very closely related to the description of social phobia.

Other psychological variables (psychopathology, anxiety sensitivity, mental health, neuroticism, life satisfaction and social support) did not predict the incidence of social pho-

bia. Based on these results and the existing literature (Bienvenu et al. 2004; Norton et al. 2000; Stein et al. 2000; Stemmerger et al. 1995; Wittchen et al. 2000), we can cautiously conclude that these variables are epiphenomena rather than precursors of social phobia.

In sum, after adjustment for sub-threshold social phobia at baseline the development of social phobia was rather predicted by phenomena that are closely related to the disorder itself, such as avoidance of social situations and interpersonal sensitivity. This might indicate that social phobia develops gradually. On the other hand this result indicates that *other* psychological problems (e.g. symptoms of depression) do not precede social phobia. Thus, social fears and social avoidance might be first indicators of a psychopathological development of adolescents. In that case social fears and avoidance might be forerunners of a psychiatric career.

Associations with social phobia at follow-up

In line with findings of other studies that social phobia is a highly comorbid disorder (e.g. Acarturk et al. 2008; Fehm et al. 2008; Vriends et al. 2007), the presence of social phobia at follow-up was associated with comorbid psychiatric disorders. Compared to women without social phobia at follow-up, women with social phobia in general had more comorbid psychiatric disorders, but specifically anxiety disorders, affective disorders and somatoform disorders. The fact that social phobia is associated with comorbid disorders, but that these psychiatric disorders do not precede or predict social phobia, might indicate that social phobia is a precursor for a "psychiatric career" instead of a consequence of it. This assumption fits to the findings of studies that found that the onset of social phobia preceded the onset of other psychiatric disorders (e.g. Beesdo et al. 2007; Dalrymple & Zimmerman 2007; Kessler et al. 1999) and by the present finding that the presence of social phobia at follow-up was associated with a broad spectrum of psychological and social problems such as more psychopathology, more anxiety sensitivity, more neuroticism and less social support. Thus, social phobia is associated with many psychological and social problems that were not present before the development of this disorder.

Strengths and limitations

The major strengths of this study are that it investigated a broad spectrum of predictors of and associations with DSM-IV social phobia in a community sample. We examined several socio-demographic factors, psychiatric history and socio-environmental and psychological factors in a longitudinal and cross-sectional setting, allowing us to better differentiate between predictors and associations of social phobia. Apart from the strengths of this study, there are several limitations that deserve to be mentioned. One major limitation is the response rate of the first wave. As detailed in Trumpf et al. (2009) respondents who participated at the first wave were compared with 251 initial non-respondents who refused detailed participation in the DPS but completed

the short questionnaire. The analyses of response bias suggested that women with more mental problems were less likely to participate in the study. Thus, if the incidence should be corrected for representativeness for Dresden in that time, it should probably be increased.

Another limitation of this study is that these data can, in the strict sense, be generalized only to women. The etiological model of social phobia does not predict major gender differences, but the assumption that there are no differences remains to be tested. Incidence rates for men, as described above, will probably be lower, thus large samples should be used to test possible gender differences in the pathway to social phobia.

Furthermore, the study sample consisted of a restricted age-group (18 to 24 years). As described above, incidence rates are probably different in older or younger populations because of the different life circumstances and life goals. Etiological models mostly include age (see for example Rapee & Spence 2004). Therefore, our etiological findings must be seen in the light of the life situation of women in late adolescence and early adulthood. Future studies should investigate if these predictors can be generalized to populations in other life stages.

Implications

The present findings do have the following implications. Therapists and general practitioners should be alert that in young adult women, especially in single women, that are in a turbulent phase of life (e.g. finding a job, continue higher education) the risk to develop social phobia is relatively high. If therapists and general practitioners recognize a sub-threshold social phobia in patients they should be aware that these persons are at a high risk to develop a clinically relevant social phobia at a diagnostic level. The fact that the presence of social phobia is associated with major psychiatric, psychological and social problems indicates that therapeutic intervention to prevent the proceeding development of social phobia is needed. According to our results these prevention efforts and interventions in therapy in order to reduce the incidence of social phobia should focus on increasing self-efficacy, decreasing dysfunctional attitudes, decreasing avoidance behavior and decreasing interpersonal sensitivity, because these factors play a major role in the development of social phobia. As these variables are closely related to the phenomenon of social phobia itself, and such symptoms are often unrecognized and untreated (Zimmerman & Chelminski 2003), practitioners need to be educated to recognize such problems, as such symptoms might be the first sign of the development of major psychiatric problems in the following year.

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