

Does Gender Affect the Relationship Between Anxiety Sensitivity and Social Anxiety?



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SUMMARY

Introduction: The literature on the relationship between Anxiety Sensitivity and Social Anxiety is limited. Although there are studies that exist on the effects of gender and time on social anxiety and anxiety sensitivity, there is no consensus on how these variables moderate the relationship between the two. The aim of this study was to examine the effect of the last year of medical school on social anxiety and to determine the predictors of social anxiety, focusing mainly on gender and anxiety sensitivity.

Methods: The study was conducted at two time points. Demographic Information Questionnaire, Liebowitz Social Anxiety Scale and Anxiety Sensitivity Index (ASI) were given to medical school students at Time 1 (n=153): beginning of 6th year of medical school; and at Time 2 (n=130): end of the 6th year (10 months later).

Results: Male gender predicted social anxiety at Time 1 but not at Time 2. Maternal education negatively predicted social anxiety in males; no prediction was observed for females. Psychiatric illness in the family and ASI scores predicted social anxiety. The total scores of social anxiety and anxiety sensitivity did not change over a course of 10 months. ASI subscale scores were not uniform in predicting social anxiety.

Conclusions: Our results have confirmed the strong relationship between anxiety sensitivity and social anxiety. Higher maternal education appeared to be a protective factor against social anxiety among males but not among females. It is apparent that a whole educational year of internship does not lead to a significant reduction in social anxiety. We also showed that the physical sensations scale of ASI is sufficient to explain the relationship between anxiety sensitivity and social anxiety.

Keywords: Social phobia, anxiety sensitivity, medical education, maternal educational status

INTRODUCTION

Anxiety sensitivity (AS) refers to discomfort and negative attributions to anxiety sensations arising from the belief that these sensations are signs of physical, psychological, or social harm (Reiss and McNally 1985). Anxiety sensitivity has been successfully used in differentiating panic anxiety from other phobic anxieties (Kılıç et al. 2014). It has also been used for differentiating several other conditions, including blood vs. dental phobias (Kılıç et al. 2014), prolonged grief vs. normal bereavement (Robinaugh et al. 2014), as well as for predicting

symptoms of depression and post-traumatic stress disorder (Kılıç et al. 2008).

Gender differences in measures of AS are similar to gender differences across anxiety disorders; females exhibit higher levels of AS and a greater prevalence of anxiety disorders than males (American Psychiatric Association, 2000; Peterson and Reiss 1993). Women score higher on the ASI than men (Peterson and Reiss 1993) and exhibit a different clustering of responses (Stewart and Baker 1999; Stewart et al. 1997). A twin study reveals that AS is heritable in women but not in men (Stein

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et al. 1999). Socialized masculinity stereotypically relies on success, power and competition, restriction of affect, restriction of emotional expression between men, and dedication to work over family; all of these characteristics lead to the potential for a gender role conflict. Although some studies suggest AS may change over time (Schmidt et al. 2000, Broman-Fulks et al. 2009), AS is best conceptualized as a personality trait as shown in meta-analyses and twin studies (Taylor et al. 2008, Naragon-Gainey 2010, Mantar et al. 2011). AS can therefore be used as a powerful tool to determine risk groups for future social anxiety.

Anxiety Sensitivity Index (ASI) is the main instrument used in assessing AS (Reiss et al. 1986). Both the total score and sub-scale scores (derived through factor analyses) of ASI have been used. Factor analyses showed ASI to be composed of three dimensions; namely, physical concerns, cognitive concerns, and social concerns (Zinbarg et al. 1997, Bernstein et al. 2013). The literature on the relationship between AS and social anxiety is limited. In one study (Gore et al. 2002) on university students, AS was shown to predict response to a social challenge test. In another study (Vriends et al. 2007) on a sample of 1396 women, AS negatively predicted recovery from social phobia at one-year follow-up. Moore et al. compared the role of AS in social anxiety between university students and clinical anxiety patients. They showed that AS and event expectancy have additive predictive effect on the development of social anxiety, and that this was true for both the clinical anxiety patients and university students. Findings on the relationship between the ASI subscales and social anxiety are not consistent across studies. Some studies showed a positive relationship between the social concerns sub-scale and social anxiety (Zinbarg et al. 1997, Rodriguez et al. 2004). On the other hand, in Grant et al.'s study, where university students were re-assessed after one year, none of the ASI subscales at Time 1 predicted social anxiety symptoms at Time 2. It is important to note that the two former studies that found a relationship (Zinbarg et al. 1997, Rodriguez et al. 2004) were on clinical samples. Although the effects of gender and time on social anxiety and AS were studied, there is no consensus as to how these variables moderate the relationship between the two (Reiss et al. 1986, Vriends et al. 2007, Rodriguez et al. 2004, Van Dam et al. 2009, Stewart et al. 1997).

Social anxiety is known to interfere with academic attainment (Kessler 2003, Lee et al. 2009, Dell'Osso et al. 2014). Its negative effects may be more pronounced in medical students, since symptoms may prevent acquisition of necessary skills for appropriate medical examination or medical/surgical procedures.

Medical education in Turkey lasts six years after high school. Clinical clerkships are taught in the fourth and fifth years. The clinical internship in the sixth year is qualitatively different from other years, since the student assumes the responsibilities

similar to those of resident physicians. Internship (6th year of medical school) is a stressful time period, full of challenges for the student; it also is a year of favorable transition from being a student to being a doctor.

The aim of this study was to examine the effect of the last year of medical school on social anxiety and to determine the predictors of social anxiety, focusing mainly on gender, and ASI and its subscales. Our hypotheses were:

The sixth year of the Faculty of Medicine will cause a detrimental effect on the SA level

SA levels will decrease as parental education levels increase

There will be a positive correlation between AS and SA levels

AS-SA relationship will be affected by gender (a stronger prediction will be found in women than in men).

METHODS

Sample

This is a cross-sectional study in two phases (Pooled Cross-Sectional Study). This is a method that allows comparison of different samples representing the universe at different times and re-analysis of these data in a pool for some statistics (Podestà and Federico 2002). It is a widely used method to determine the tendency of certain features in a given community and to determine the predictors of this tendency. It is considered to be superior to the cohort method in giving more reliable results since it does not have a test-retest effect (Podestà 2002, Schmidt 1997).

Our samples were chosen from the same population of Hacettepe University Medical School students at two time points: Time 1: beginning of the 6th year of medical school; Time 2: end of the 6th year (10 months later). Sixth year students are sorted by their last names and distributed to clerkships. Major clerkships contain higher numbers of students than others. Instead of random sampling, we decided to maximize the number of students enrolled in the study by targeting clerkships with the highest number of enrolled students, a strategy that would also increase the representativeness of our final samples. At Time 1, 153 students were drawn from a total of 299 students in July 2009. At Time 2, 130 students (out of a total of 299) were drawn from the same group in April 2010.

Instruments

Demographic Information Questionnaire was developed by the researchers and assessed relationship status, parents' education level, previous psychiatric illness, psychiatric illness in the family, medical illnesses, cigarette smoking, and alcohol use, in addition to standard demographic information.

Liebowitz Social Anxiety Scale (LSAS) (Liebowitz 1987, Heimberg et al. 1999) is a 24-item measure used to assess the range of common social interaction and performance fears (24 items) and avoidances (24 items). It can also be used as a self-report questionnaire (Soykan et al. 2003, Rytwinski et al. 2009). Thirteen items relate to performance anxiety and, 11 are on anxiety in social situations. The validity and reliability study for the Turkish version of the scale was done by Soykan et al. Cronbach's alpha was 0.94; the hit rate was (cut off value=50) 95.5%, and the rate for false negative was 4.5%. The internal consistency of LSAS in the current study was 0.96.

Anxiety Sensitivity Index (Reiss et al. 1986) is a 16-item self-report questionnaire designed to assess the construct of anxiety sensitivity. Each item is rated on a five-point Likert scale ranging from 0 (very little) to 4 (very much). ASI was shown to be composed of three major domains: physical concerns, cognitive concerns, and social concerns (Zinbarg et al. 1997, Bernstein et al. 2013). The questionnaire was translated into Turkish and was shown to be reliable (Cronbach's alpha: 0.82) (Ayvaşık 2000). The internal consistency of ASI used in the current study was 0.87.

Procedure

At Time 1, 153 volunteering students were assessed using a batch of self-report measures. Ten months later, 130 students were assessed using the same measures. All assessments were done in the classrooms and lasted about 30 minutes. The assessment batches were anonymous, and we did not assess whether the subject participated in both waves or not.

RESULTS

The sample consisted of 283 students (Time 1: 153, Time 2: 130; 160 male, 123 female). The mean age of the sample was 23.9 years (SD=1.1). Six of the mothers of the Time 1 students were illiterate, seventy-six were primary and secondary school graduates, and seventy-one were university graduates; Two of the mothers of the Time 2 students were illiterate, seventy-four were primary and secondary school graduates, and fifty-two were university graduates. The mean values of LSAS, ASI, and ASI subscales, as well as their relationships to

gender and time, are given in Table 1. There were no gender differences in terms of ASI total or subscale scores, or LSAS score. ASI Social Concerns sub-scale score was higher in Time 1 than in Time 2. Other ASI variables did not relate to time.

We set up three regression models to test our hypotheses. In Model 1, we examined the predictors of LSAS score in the total group (N=283). Model 2 tested the same prediction within males and females separately. Finally, in Model 3, we ran the same regression analysis for both Time 1 and Time 2 (Table 2). Independent variables were: gender (1=males, 2=females), mothers' and father's education levels (1=illiterate, 2=primary school, 3=secondary school, 4=high school, 5=university), history of psychiatric illness (0=absent, 1=present), psychiatric illness in the family (0=absent, 1=present), being in a romantic relationship (0=no, 1=yes), time (Time 1=0, Time 2=1), ASI total score (0-64), Physical Concerns (0-32), Cognitive Concerns (0-12), Social Concerns (0-12) .

In the total sample (Model 1), ASI total score was the strongest predictor of LSAS: higher anxiety sensitivity (ASI) predicted higher social anxiety (LSAS). Family psychiatric history (but not personal history) also predicted LSAS score. Higher education level of the mother and having a partner seemed to have a protective role: both negatively predicted the LSAS score. Within-gender analyses provided additional information: although the prediction of LSAS by ASI and family psychiatric history held for both sexes, relationship status and mother's education were significant only in males. Model 3 showed that Time 1 and Time 2 students differed only in terms of prediction of LSAS by family history, which was stronger in Time 2 students (both were significant). There was also a trend for male gender at Time 1.

We repeated the same analyses replacing ASI total score with its subscale scores (Table 2a). The prediction of LSAS by variables other than ASI was very similar to the previous analyses. ASI subscale scores, however, were not uniform in predicting LSAS: Physical and Cognitive Concern subscale scores positively predicted LSAS score, whereas Social Concern scores did not relate to LSAS. On the other hand, the prediction of LSAS by Cognitive Concerns subscale within time periods differed; the prediction was lost for Time 2 students. The trend for gender in the previous analyses reached significance.

Table 1. LSAS, ASI, and ASI subscale scores by gender and time

Variable	LSAS	ASI Total	ASI physical	ASI cognitive	ASI Social
Gender	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Males(N=160, %56.5)	31.54(20.7)	13.94(8.8)	6.66(5.3)	2.27(2.1)	4.26(2.4)
Females(N=123,%43.5)	29.37(18.8)	14.07(9.1)	6.96(5.4)	2.36(2.3)	3.96(2.4)
Time					
Time 1 (N=153)	30.55(19.74)	14.28(8.7)	6.51(5.2)	2.52(2.2)	4.52(2.3)*
Time 2 (N=130)	30.66(20.13)	13.66(9.2)	7.12(5.6)	2.07(2.1)	3.67(2.4)*

*p < 0.01

Table 2. Predictors of LSAS score in three models: total group (model 1), within gender groups (model 2), within time (model 3)

Explanatory variables	Model 1 Total Group	Model 2 Within Gender Groups		Model 3 Within Time	
		Males	Females	Time 1	Time 2
Gender	-0.080			-0.133t	-0.010
Mother's education level	-0.118*	-0.169*	-0.020	-0.121	-0.093
Father's education level	-0.030	-0.033	-0.052	-0.008	-0.087
Psychiatric history (family)	0.220**	0.204*	0.256***	0.159*	0.307***
Psychiatric history (own)	-0.097t	-0.100	-0.116t	-0.092	-0.096
Partnership	-0.116*	-0.145*	-0.091	-0.118t	-0.099
Time	0.029	-0.030	0.126t		
ASI Total score	0.550***	0.459***	0.593***	0.554***	0.433***

t: trend, * p < 0.05, **p < 0.01, ***p < 0.001

Table 2a. Predictors of LSAS score in three models using ASI subscale scores

Explanatory variables	Model 1 Total Group	Model 2 Within Gender Groups		Model 3 Within Time	
		Males	Females	Time 1	Time 2
Gender	-0.095			-0.152*	-0.013
Mother's education level	-0.105t	-0.156*	-0.013	-0.101	-0.092
Father's education level	-0.051	-0.048	-0.070	-0.057	-0.067
Psychiatric history (family)	0.206***	0.205**	0.244**	0.154*	0.282***
Psychiatric history (own)	-0.093t	-0.102	-0.099	-0.098	-0.085
Partnership	-0.123*	-0.139*	-0.107	-0.126t	-0.107
Time	0.006	-0.056	0.109		
Physical Concerns	0.381***	0.345***	0.450***	0.387***	0.372***
Cognitive Concerns	0.231***	0.260**	0.196*	0.293**	0.130
Social Concerns	-0.047	-0.100	0.025	-0.049	-0.025

t: trend, * p < 0.05, **p < 0.01, ***p < 0.001

Although the tendency of gender to predict the LSAS in which model the total score was used, male gender predicted social anxiety at Time 1 but not at Time 2.

DISCUSSION

This is one of the few studies examining predictors of social anxiety among medical students. Social anxiety is common among university students and can lead to disruption of academic achievement (Kessler 2003, Lee et al. 2009, Dell'Osso et al. 2014). Over a course of 10 months, there was essentially no change in the social anxiety scores of medical students. The education and training officially administered in the 6th year of medical school does not include any intervention (either structured or unstructured) designed to decrease social anxiety levels of students. It is apparent that a whole educational year of internship, which requires close contact with patients and their families, assuming clinical responsibilities comparable to those of clinical residents, and intense and demanding

interaction with peers, superiors and professors, does not lead to a significant reduction in social anxiety. The persistence of social anxiety levels over time was observed in almost all LSAS items. The only factor that seemed to have a different relationship to social anxiety between Time 1 and Time 2 was gender. Male gender predicted social anxiety among students at Time 1, but not among Time 2 subjects. From Time 1 to Time 2, there was a slight decrease in LSAS score in males (from 32.0 to 31.0), whereas there was a slight increase in females (from 28.7 to 30.2) (neither change was significant). The disappearance of prediction of LSAS by male gender at Time 2 may be due to higher exposure among males to role-related stresses compared to females, which may have helped them learn to cope better. It is also possible that residents supervising 6th year students may favor males over females in delegating clinical responsibilities, another probable reason for males' greater improvement in this respect.

Regression analyses revealed two predictors of social anxiety in the total group: namely, presence of psychiatric illness in

the family, and currently not being in a relationship. Personal psychiatric history was not predictive, and there was a trend for lower maternal education to predict social anxiety. When regressions were run separately within gender and time, however, higher maternal education level appeared to be a protective factor against social anxiety among males, but not among females. The protection due to being in a romantic relationship was only observed in men.

The literature suggests that parental education has a protective effect on children in terms of their social anxiety levels (Demir et al. 2013, Cheng et al. 2015). There are very few studies, however, comparing the effects of paternal and maternal education in this respect. In one study on autistic subjects, mothers' education was more protective than fathers' education against the development of social anxiety (Gadow et al. 2016). Another study on children and adolescents had shown that maternal (and not paternal) education is important in predicting general psychopathology (Sonego et al. 2013). No study has examined if males and females are differently affected by maternal versus paternal education levels. It is reasonable to assume that more educated mothers are more intelligent, with better language and problem-solving abilities. Why males should benefit from these abilities more than females is an important issue that requires further research. It could be speculated that mothers can provide optimal levels of emotional support to their daughters regardless of their educational level, whereas supporting a male may require higher skills that necessitate higher education.

This is one of the few studies to examine the factors that moderate the relationship between anxiety sensitivity and social anxiety. Anxiety sensitivity is considered to be a personality trait and would not be expected to change over time, a point that was confirmed by several studies (Taylor et al. 2008, Naragon-Gainey 2010, Mantar et al. 2011). Our findings were also in line with literature, supporting our second hypothesis (ASI would stay constant over time). We have shown that anxiety sensitivity is a very strong predictor of social anxiety. The prediction was consistent across time points and gender. It would be interesting to see if this consistency is observed in different samples. The relationship of different domains of ASI to social anxiety, however, was not consistent. In addition, the relationships of sub-scales of ASI with social anxiety do not show similarity. For example, physical concerns subscale was the strongest predictor of social anxiety, and this prediction was constant over time. Cognitive concerns subscale was a moderate predictor at Time 1 and lost its prediction at Time 2. Social concerns, on the other hand, did not relate to LSAS at either time point. These observations lend support to previous reports suggesting that the ASI social concerns scale may better be conceptualized as negative evaluation sensitivity (McWilliams et al. 2000). Both cognitive concern and social concern scores decreased in time (decrease

in social concerns subscale was significant), which may be responsible for the changes in time of their predictive power.

Our research has some limitations. We did not assess social anxiety using interviews; rather, we used self-report measures. Although we had measurements at two time points, we do not have a genuine repeated assessment in time, due to the sampling design. Future studies should ideally ask the subjects if they have participated in the first wave of data collection.

Conclusions

This study has shown how gender may affect social anxiety levels in university students: more years of education in the mother protects against social anxiety in her son, but not in her daughter. Males also seem to benefit more in this respect from having a partner than females do. Both education and being in a romantic relationship are characteristics determined by a large number of factors that we cannot control in our research. For this reason, our results need to be supported by studies that investigate these issues in detail. Our results have confirmed the strong relationship between AS and social anxiety. Being a trait marker, AS may be useful in determining subjects at risk for social anxiety, allowing early interventions. Finally, our findings support others showing that some items in ASI may be redundant; items tapping fear of physical sensations seem sufficient to explain the relationship between anxiety sensitivity and social anxiety.

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