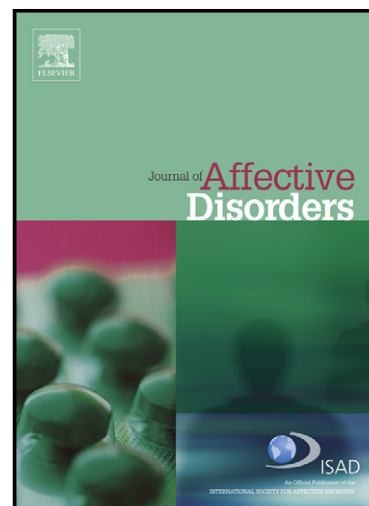


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Running head: SOCIAL PHOBIA LIFESPAN

Social Phobia Symptoms across the Adult Lifespan

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Abstract

Background:

This study investigated symptom patterns that might distinguish between individuals with and without a diagnosis of Social Phobia (SP) across the adult lifespan.

Methods:

A sample of 5,411 self-reported social worriers was derived from Wave 1 (2001-2002) of the U.S. National Epidemiological Survey of Alcohol and Related Conditions (NESARC).

Participants were stratified into four age groups (18-29 years, 30-44 years, 45-64 years, 65-96 years), and further divided into two diagnostic groups (self-reported social worriers with and without a SP diagnosis).

Results:

Binary logistic regression analyses revealed that a core set of symptoms was associated with SP across the adult lifespan. There were also successive reductions in the number of

symptoms associated with SP in each age group, such that older adults endorsed numerically fewer SP symptoms.

Limitations:

Though our sample size is smaller than ideal for the nature of our analyses, the NESARC represents one of the largest existing clinical datasets we know of.

Conclusions:

Despite age-related reductions in symptom frequency, a core set of SP symptoms consistently distinguished between diagnostic groups, irrespective of age.

Keywords: social anxiety; symptom presentation; assessment; diagnosis

1. Introduction

Social Phobia (SP), also known as Social Anxiety Disorder, is characterised by apprehension toward social or interpersonal situations, which the afflicted individual actively avoids or endures with extreme discomfort due to a pervasive fear of criticism, rejection, and/or humiliation (APA, 1994; WHO, 2010). In order to constitute a diagnosis, these symptoms must be considered by the individual to be distressing and/or disabling in everyday situations (APA, 1994). In recent epidemiological studies, the lifetime prevalence of SP has been estimated to range from 5% to 12.1%, and the 12-month prevalence has been estimated to range from 2.8% to 7.1% (Grant et al. 2005; Kessler et al. 2005; Ruscio et al. 2008). SP is associated with poor quality of life and increased number of missed days at work (Alonso et al. 2004; Stein & Kean, 2000). SP is also a risk factor for major depression and substance abuse disorders, and is often comorbid with these disorders (Lampe et al., 2003; Stein & Stein, 2008). Several studies have found that pure SP is associated with increased suicidal

ideation and suicidal behaviours, and that psychiatric comorbidities strengthen this link (Sareen et al. 2002; Schneier et al., 1992; Thibodeau et al. 2013).

Age-related changes in the prevalence of anxiety disorders and presentation of anxiety symptoms complicate diagnosis and treatment of anxiety disorders, with such complications particularly manifest in older adults (Flint, 2007; Stanley et al., 1996; Gonçalves & Byrne, 2013; Wolitzky-Taylor et al., 2010). Lifetime and 12-month prevalence estimates of SP among older adults are reported to range from 3.5% to 6.6% and 1.3% to 2.3%, respectively – about half the prevalence estimates found in younger cohorts (Cairney et al. 2007; Chou, 2009; Gum et al., 2009; Kessler et al, 2005). Despite these age-related reductions in prevalence estimates, anxiety disorders remain among the most highly prevalent mental health disorders in older adults.

Despite some overlap in SP symptom patterns endorsed by younger and older adults, there are also some notable phenomenological differences between these age groups. Older adults have been found to endorse overall fewer and distinctive types of SP symptoms relative to younger adults on the Social Phobia and Anxiety Inventory (SPAI) (Gretarsdottir et al., 2004). Whereas younger adults (aged 17 – 55) scored significantly higher than older adults (aged 60 – 94) on 19 of 32 symptoms, older adults scored higher on only 2 of 32 symptoms, with no significant differences between age groups on the remaining 11 symptoms. The specific symptoms on which older adults endorsed greater severity were: “anxious when talking about business” and “anxious when writing or typing in front of others.” Similar trends have also been observed in studies assessing age-related differences in the phenomenology of Generalized Anxiety Disorder, Post-Traumatic Stress Disorder, and Specific Phobia, such that these disorders are associated with age-related reductions in the number of reported symptoms, and differences in the phenomenology of symptoms (Bottche

et al., 2012; Deer & Calamari, 1998; Frueh et al. 2004; Gonçalves & Byrne, 2013; Gould & Edelstein, 2010; Miloyan et al., 2014).

The purpose of the current study was to determine the nature of symptoms that distinguish between individuals with a diagnosis of SP and individuals with sub-threshold SP symptoms across the adult lifespan. Sub-threshold SP is typically characterized by symptoms not meeting diagnostic threshold, and previous research has found that sub-threshold SP bears some clinical significance (Stein et al., 2000). We hypothesized that a distinctive pattern of symptoms would distinguish between socially anxious adults with and without a diagnosis of SP in different age groups. Based on previous findings, we also expected to observe an age-related decrease in the number of SP symptoms endorsed, with older adults endorsing fewer symptoms.

2. Method

2.1 Sample

The National Epidemiological Survey of Alcohol and Related Conditions (NESARC) was undertaken in 2001-2002 in a nationally representative sample of 43,093 civilian, non-institutionalized adults who were sampled from all 50 U.S. states and the District of Columbia. The overall response rate was 81%. African-Americans, Hispanics, and young adults were purposively oversampled, and sampling weights were used to adjust data for oversampling and nonresponse, and to allow population estimates to be standardized against census data.

Only participants who endorsed one of three screening questions (“Ever had strong fear or avoidance of social situation?”, “Had fear/avoidance of social situation due to fear of embarrassment at what you might say/do around others?” or “Had fear/avoidance of social situation due to fear of becoming speechless, having nothing to say or saying something

foolish?") were included in the current analyses because these were the only individuals who were further assessed for SP symptoms (N=5,411). SP symptoms included participant responses (Yes or No) to 26 questions from the SP section of the AUDADIS-IV diagnostic interview, which addressed DSM-IV Social Phobia symptom clusters. For a full list of the symptoms that were assessed, see the Supplementary Data File.

2.2 *Measures*

Twelve-month non-hierarchical SP diagnoses were obtained by trained interviewers using the Alcohol Use Disorder and Associated Disabilities Interview Schedule – DSM-IV version (AUDADIS-IV). All analyses accounted for gender, education (some college or higher, completed high school, less than high school), personal income (\$0-9,999; \$10,000-34,999; \$35,000+), marital status (married/cohabiting, widowed/divorced/separated, never married), urbanicity (urban, rural), geographic region (Northeast, Midwest, South, West), self-perceived health (excellent, very good, good, fair, poor), and chronic medical conditions (none, one or more).

2.3 *Procedure*

Participants were stratified into one of four age groups (18-29yrs; 30-44yrs; 45-64yrs; 65-96yrs) and one of two diagnostic groups (12-month SP diagnosis; or Sub-Threshold SP). Four sets of binary logistic regression analyses were performed to determine the symptoms that best distinguished between individuals with threshold and sub-threshold SP within each age group.

2.4 *Statistical Analyses*

Stata 12.0 was used to conduct all statistical analyses, and survey commands were used to account for the complex survey design of the NESARC (Statacorp, 2011). Raw frequencies, weighted proportions, and chi-square tests were calculated within age groups and between diagnostic groups. Preliminary analyses assessing the proportion of each

symptom between individuals with sub-threshold and threshold SP justified the inclusion of all symptoms assessed in the diagnostic interview. Weighted binary logistic regression analyses using Odds Ratios (ORs) indicated the specific symptoms that best distinguished between individuals with and without an SP diagnosis in each age group, after accounting for sociodemographic and health variables.

3. Results

3.1 *Socio-demographic characteristics of the sample*

The overall sample comprised 5,411 individuals reporting social worries. These individuals represented 12.6% of the total survey population. The 18-29 year old subgroup consisted of 1,158 participants ($M_{age}= 23$, 55% female), the 30-44 year old subgroup consisted of 1,666 participants ($M_{age}= 37$, 58% female), the 45-64 year old subgroup consisted of 1,740 participants ($M_{age}= 53$, 60% female), and the 65-96 subgroup consisted of 847 participants ($M_{age}= 75$, 68% female).

Within the sample used for these analyses, 1,159 participants (21.4%) had a 12-month SP diagnosis. Seventy-seven percent of the sample reported that their health was good, very good, or excellent, and fifty-six percent reported an absence of chronic medical conditions. Eighty-two percent of the sample had completed a high school education, and fifty percent had completed at least some college. Approximately a third of the sample reported an annual personal income greater than \$35,000. Forty-seven percent of participants were either married or cohabiting, twenty-seven percent were either widowed, divorced, or separated, and twenty-six percent were never married.

3.2 *Number of Symptoms*

Figure 1 illustrates the trend of SP symptom count with increasing age, indicating a slight linear decline in the number of SP symptoms endorsed by increasingly older

individuals. Though the term decline is typically reserved for longitudinal data, we use it here to highlight cross-sectional decreases in symptom frequency by increasing age.

3.3 *Type of Symptoms*

Binary logistic regression analyses revealed that a core set of six distinct symptoms was associated with SP across the adult lifespan, irrespective of age. The symptoms “thinking about social situations almost always made you anxious”, “usually became upset / anxious when had to be in social situations”, “remained in social situations because had to be there, even though it made you anxious”, “avoid social situations because of strong fear of them”, “thought you were more anxious about social situations than most people, and “thought own fear/avoidance of these social situations was stronger than should be” were significant individual predictors of SP group membership across the adult lifespan. In other words, these six symptoms of SP were age invariant. In addition to these six core symptoms that were significantly associated with a SP diagnosis in each age group, a relatively distinctive set of additional symptoms distinguished between individuals with and without a SP diagnosis in each age group (See Table 2).

In terms of sociodemographic, health, and comorbidity variables, only one variable (12-month diagnosis of anxiety disorder [not including SP]) was an age invariant predictor of a current SP diagnosis. Aside from this, different sets of sociodemographic, health and comorbidity variables were associated with SP in each age group.

4. **Discussion**

The results of this study suggest that a core set of symptoms is associated with SP across the adult lifespan, and that there is a progressive age-related reduction in the number of symptoms associated with SP. These results are particularly noteworthy because they indicate that a core set of symptoms is capable of distinguishing between adults with and without an SP diagnosis, irrespective of age. Moreover, the utility of these symptoms for

distinguishing between individuals with threshold and sub-threshold SP seems to persist in spite of the decreasing number of symptoms endorsed in progressively older age groups. Finally, by demonstrating that fewer symptoms are associated with SP diagnosis in older adults, these results account for some of the difficulty associated with diagnosing late-life anxiety, and underscore a need for more careful assessment of SP symptoms in older adults.

Our findings are also consistent with those of a previous study, which reported that the general profile of SP is largely stable across adulthood, despite age-related reductions in SP symptoms (Gretarsdottir et al., 2004). In fact, the finding of age-related decreases in SP severity is also consistent with a large body of research indicating that fewer symptoms are associated with late-life Generalised Anxiety Disorder, Post-Traumatic Stress Disorder, and Panic Disorder (Bottche et al., 2012; Deer & Calamari, 1998; Frueh et al. 2004; Gonçalves & Byrne, 2013; Gould & Edelstein, 2010; Miloyan et al., 2014). It is likely that age-related reductions in the number of symptoms associated with SP, and with anxiety symptoms in general, contribute to difficulties in the detection of late-life anxiety disorders. An important direction for future research is to determine the nature of age-related reductions in the number and severity of anxiety symptoms. Furthermore, it will be important to determine whether older adulthood is associated with a lower threshold of anxiety symptoms required to account for disability and distress. If fewer symptoms account for clinically significant disability and distress in old age, this would have key implications for prevalence estimates, and for the detection and management of anxiety disorders.

The utility of an age invariant set of symptoms for identifying SP could be useful in guiding the development of screening questionnaires. Given the highly comorbid nature of SP, a screening tool might also confer a benefit for identifying individuals with psychopathology in a variety of contexts. In fact, a concurrent 12-month diagnosis of anxiety disorder (not including SP) was also an age invariant predictor of SP diagnosis in this sample,

suggesting an indirect association between this core set of symptoms and anxiety disorders in general. It must be noted that there were also important differences between cohorts, such that some variables were uniquely associated with clinical SP in a particular cohort. For example, personality disorders were selectively and positively associated with SP in younger adults (aged 18 – 44), whereas a lifetime diagnosis of anxiety was uniquely and negatively associated with SP in middle-aged and older adults (aged 45 – 96). Furthermore, a concurrent 12-month diagnosis of mood disorder was uniquely and positively associated with SP in the 18 – 29 year old cohort.

Due to the design of the NESARC, only individuals who provided an affirmative response to one of three screening questions about social anxiety were further probed for SP symptoms, and were subsequently included in our analyses. Due to this design feature, an asymptomatic comparison group was effectively excluded from further examination. While the absence of an asymptomatic control group for comparative purposes may be considered a weakness of our methodology, we contend that this does not represent a major limitation of our study. Clinical diagnosis frequently involves distinguishing between individuals with pathological SP compared to those with non-pathological SP (i.e. those with sub-threshold symptoms) whilst clinical decisions involving asymptomatic individuals are generally straightforward. Although we acknowledge that inclusion of an asymptomatic group would have been informative, we believe the absence of such a group does not significantly detract from the clinical value of these findings.

However, there are some important limitations to our study. First, all SP symptoms were pre-selected and assessed with dichotomous responses ('Yes' or 'No'). Therefore, differences in the severity of each individual symptom reported could not be investigated. Further, participant responses could not be followed up with more specific questions

regarding the nature of SP symptoms, and a more detailed analysis of changes in SP phenomenology across the adulthood was not possible.

Second, psychiatric comorbidity was accounted for such that anxiety, mood, and personality disorders were clustered together into general categories. It therefore remains unclear whether specific comorbidities feature more or less prominently with SP, and whether these might impact the presentation of SP symptoms in different age groups. It also remains unclear whether age-related decreases in SP symptoms occur over and above those of age-related reductions in other types of anxiety. Future studies should provide a more detailed assessment of the relationship between SP diagnosis, symptom patterns, and psychiatric comorbidity across adulthood. Finally, though our sample size is smaller than ideal for such analyses, the NESARC dataset remains among the largest recent datasets we know of that was specifically designed for addressing such questions.

5. Conclusion

We have outlined the symptom patterns that distinguish between individuals with and without a diagnosis of SP, demonstrating the presence of a core set of symptoms associated with SP diagnosis across the adult lifespan, and a simultaneous reduction in the number of symptoms endorsed by older adults. On one hand, these findings suggest that SP presents consistently throughout adulthood. On the other hand, the findings suggest that diagnostic criteria might account for age-related reductions in SP symptoms. More research is needed to determine the nature of age-related differences in the number and phenomenology of anxiety symptoms.

Conflict of interest: None declared

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Figure 1. *Estimates of cross-sectional changes in Social Phobia symptom frequency.*Table 1. *Comparison of socio-demographic, health, and comorbidity characteristics, by current Social Phobia diagnosis.*

| | raw frequencies (and weighted proportions) | | |
|----------------------------|--|-----------------------------|----------------------------|
| | Asymptomatic n = 37,682 | Sub-Threshold* n = 4,252 | Social Phobia n = 1,159 |
| Age | 47 ± 18.27 | 46 ± 17.79 | 43 ± 16.00 |
| Sex | | | |
| Male | 16,333 (48%) | 1,787 (47%) | 398 (37%) |
| Female | 21,349 (52%) | 2,465 (53%) | 761 (63%) |
| Education | | | |
| Some college or higher | 19,975 (55%) | 2,155 (52%) | 226 (18%) |
| Completed high school | 10,821 (29%) | 1,360 (32%) | 366 (32%) |
| Less than high school | 6,886 (16%) | 737 (16%) | 567 (50%) |
| Personal Income | | | |
| 35,000+ | 10,748 (31%) | 1,019 (25%) | 250 (23%) |
| 10,000 – 34,999 | 16,780 (43%) | 1,938 (44%) | 500 (43%) |
| 0 – 9,999 | 10,154 (26%) | 1,295 (31%) | 409 (34%) |
| Marital Status | | | |
| Married | 19,548 (62%) | 1,996 (57%) | 537 (58%) |
| Widowed/divorced/separated | 9,664 (17%) | 1,151 (19%) | 302 (18%) |
| Never married | 8,470 (21%) | 1,105 (24%) | 320 (24%) |
| Urbanicity | | | |
| Urban | 31,003 (81%) | 3,406 (78%) | 888 (74%) |
| Rural | 6,679 (19%) | 846 (22%) | 271 (26%) |
| Self-Perceived Health | | | |
| Excellent | 11,132 (32%) | 980 (23%) | 204 (19%) |
| Very Good | 10,904 (30%) | 1,207 (31%) | 313 (29%) |
| Good | 9,191 (24%) | 1,146 (27%) | 312 (26%) |
| Fair | 4,347 (10%) | 655 (14%) | 217 (17%) |
| Poor | 1,850 (4%) | 256 (5%) | 113 (9%) |
| Chronic Medical | | | |
| None | 25,055 (68%) | 2,443 (60%) | 613 (54%) |
| One or more | 12,627 (32%) | 1,809 (40%) | 546 (46%) |
| Current Anxiety | | | |
| No | 34,730 (92%) | 3,483 (83%) | 569 (50%) |
| Yes | 2,952 (8%) | 769 (17%) | 590 (50%) |
| Current Mood | | | |
| No | 34,556 (92%) | 3,399 (81%) | 673 (58%) |
| Yes | 3,116 (8%) | 853 (19%) | 486 (42%) |
| Lifetime Anxiety | | | |
| No | 33,059 (88%) | 2,964 (70%) | 442 (38%) |
| Yes | 4,623 (12%) | 1,288 (30%) | 717 (62%) |
| Lifetime Mood | | | |
| No | 31,013 (82%) | 2,554 (61%) | 425 (37%) |
| Yes | 6,669 (18%) | 1,698 (39%) | 734 (63%) |

Lifetime Personality

| | | | |
|-----|--------------|-------------|-----------|
| No | 33,341 (88%) | 2,700 (63%) | 446 (38%) |
| Yes | 4,341 (12%) | 1,552 (37%) | 713 (62%) |

*‘Sub-threshold’ includes all participants who endorsed at least one of three screening questions without a diagnosis of SP

Table 5. Summary of binary logistic regression analyses showing symptoms distinguishing between worriers with and without Social Phobia by age group.

| ODDS RATIOS and 95% CIs | | | |
|---|--|---|--|
| 18 – 29 years old | 30 – 44 years old | 45 – 64 years old | 65 – 96 years old |
| <i>CORE SET OF SYMPTOMS:</i> | | | |
| Usually became upset / anxious when had to be in SS? 11.91 6.07 – 23.37*** | Usually became upset / anxious when had to be in SS? 8.81 4.82 – 16.08*** | Usually became upset / anxious when had to be in SS? 4.48 2.60 – 7.72*** | Usually became upset / anxious when had to be in SS? 6.82 2.49 – 18.70*** |
| Thought own fear / avoidance of SS stronger than should be? 3.49 2.11 – 5.75*** | Thought own fear / avoidance of SS stronger than should be? 5.93 3.73 – 9.41*** | Thought own fear / avoidance of SS stronger than should be? 10.15 6.14 – 16.76*** | Thought own fear / avoidance of SS stronger than should be? 7.95 3.69 – 17.15*** |
| Avoid SS because of strong fear? 2.40 1.53 – 3.75*** | Avoid SS because of strong fear? 1.85 1.27 – 2.70** | Avoid SS because of strong fear? 2.14 1.49 – 3.07*** | Avoid SS because of strong fear? 2.96 1.60 – 5.47** |
| Thinking about SS almost always made you anxious? 1.88 1.22 – 2.92** | Thinking about SS almost always made you anxious? 2.06 1.43 – 2.96*** | Thinking about SS almost always made you anxious? 2.50 1.71 – 3.65*** | Thinking about SS almost always made you anxious? 2.61 1.25 – 5.46* |
| Remained in SS because had to, even though very anxious? 2.13 1.10 – 4.13* | Remained in SS because had to, even though very anxious? 2.01 1.18 – 3.42* | Remained in SS because had to, even though very anxious? 2.18 1.35 – 3.51** | Remained in SS because had to, even though very anxious? 3.60 1.70 – 7.67** |
| Thought you were more anxious about SS than most people 6.89 3.98 – 11.93*** | Thought you were more anxious about SS than most people 2.43 1.62 – 3.64*** | Thought you were more anxious about SS than most people 1.97 1.33 – 2.92** | Thought you were more anxious about SS than most people 2.18 1.14 – 4.17* |
| <i>ADDITIONAL SYMPTOMS:</i> | | | |
| (1) Fear/avoidance of eating or drinking in public? .54 .30 – .98* | (1) Remained in SS because had to, even though anxious of having panic attack? .38 .20 – .73** | (1) Fear/avoidance of being in small group situation? .58 .36 – .94* | (1) Fear / avoidance of performing in front of others? .32 .14 – .73** |
| (2) Often needed to bring someone along to SS in case of panic attack? 3.47 1.07 – 11.27* | (2) Avoided SS because of fear of having panic attack? 4.79 2.15 – 10.69*** | (2) In SS that made you anxious, ever have a panic attack? 2.52 1.22 – 5.22* | |
| (3) Fear/avoidance of writing while someone else watches? 1.89 1.11 – 3.21* | (3) Fear/avoidance of talking in front of others? 2.00 1.13 – 3.56* | (3) Fear/avoidance of taking part or speaking in a meeting? 1.64 1.06 – 2.54* | |
| (4) Fear/avoidance of important exam? 1.71 1.08 – 2.71* | | (4) Fear/avoidance of dating? 1.57 1.05 – 2.36* | |
| | | (5) Fear/avoidance of any other SS? 1.48 1.04 – 2.08* | |
| <i>SOCIODEMOGRAPHIC, HEALTH, AND COMORBIDITY VARIABLES:</i> | | | |

| | | | |
|---|---|---|--|
| (1) 1-year anxiety disorder (no SP) 2.26 1.13 – 4.51* | (1) 1-year anxiety disorder (no SP) 2.61 1.62 – 4.21*** | (1) 1-year anxiety disorder (no SP) 3.03 1.87 – 4.88*** | (1) 1-year anxiety disorder (no SP) 9.93 3.43 – 28.72*** |
| (2) Personality disorder 1.70 1.07 – 2.68* | (2) Personality disorder 1.46 1.03 – 2.06* | (2) Lifetime anxiety disorder .45 .27 – .74** | (2) Lifetime anxiety disorder .16 .06 – .46** |
| (3) 1-year mood disorder 2.68 1.44 – 5.00* | | | (3) Geographic region: West 2.74 1.08 – 6.98* |
| (4) Lifetime mood disorder .42 .22 – .80** | | | |
| (5) Self-perceived health: Fair .42 .18 – .98* | | | |

*p<.05; **p<.01; ***p<.0001; SS = Social Situations

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N/A

Conflict of Interest

None declared.

Contributors

Beyon Miloyan conceived and designed the study, and performed all statistical analyses. Adam Bulley drafted the manuscript. Beyon Miloyan, Adam Bulley, Gerard Byrne, and Nancy Pachana edited the manuscript for important content.

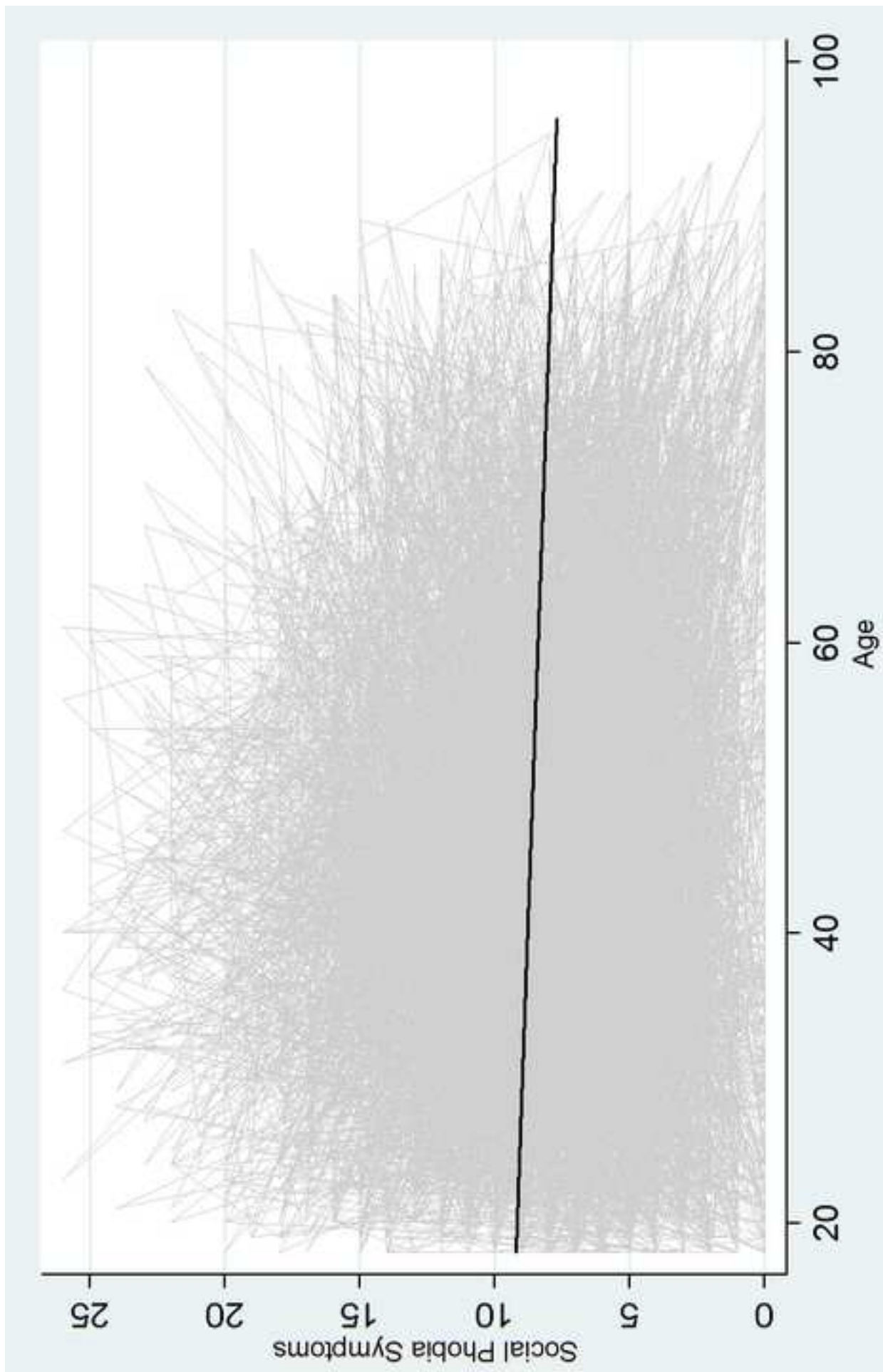


Figure 1