

# IS SOCIAL ANXIETY ALWAYS «SOCIAL»? AN INVESTIGATION OF PERSONALITY COGNITIVE AND AUTISTIC FACTORS

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## SUMMARY

**Background:** Social anxiety (SA) disorder is a common psychological condition; however, its boundaries with autism spectrum disorder remain a subject of debate. This study examines the contribution of personality, cognitive, and autistic traits to manifestations of SA in adults. To assess how personality, cognitive, and autistic traits affect SA and to define the impact of autistic features on its development.

**Methods:** The study included 72 adults (42 women, 30 men) over 18, with different levels of SA and autistic traits. Participants completed several questionnaires: Social Anxiety and Social Phobia Questionnaire, HEXACO-60-PI-R60 Personality Questionnaire, Hostility Scale, Cognitive Styles Questionnaire, Autism Spectrum Quotient, Behavior Self-Regulation Style Questionnaire, and an Emotional Intelligence Test.

**Results:** Two groups were studied: (A) high SA with low autistic traits, and (B) high SA with high autistic traits. T-tests and regression analyses were used. No significant differences in overall SA were found between the groups; however, individuals with pronounced autistic traits exhibited greater anxiety in situations requiring initiative and being under observation. Group B demonstrated higher scores on all autism spectrum scales and distinctive personality profiles (low extraversion, high honesty/humility, vigilance, and negativism). Regression analysis revealed distinct predictive factors for SA in the two groups. For Group A this included the following parameters: Liveliness, lower Sociability, decreased Modeling of Conditions, heightened Sentimentality and increased Attention to Detail (89% of the variance in SA scores). For Group B they included low Social Self-Esteem, reduced Flexibility, diminished Reliability, elevated Dependence, and stronger Field Independence (92% of the variance in SA scores).

**Conclusion:** Personality and cognitive predictors of SA differ depending on the presence of autistic traits. The data confirm the necessity of a differentiated diagnostic and therapeutic approach. Future studies should employ longitudinal research designs to investigate causal relationships between variables.

**Key words:** social anxiety - autistic traits - cognitive styles - personal features

**Abbreviations:** SA - Social Anxiety; ASD - Autism Spectrum Disorder; AT - Autistic traits; HEXACO - HEXACO Personality Inventory; AQ - Autism Spectrum Quotient; EI - Emotional Intelligence

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## INTRODUCTION

Social anxiety (SA) is among the most common psychopathological conditions in adults, affecting quality of life and social functioning (Stein et al. 2017). Its prevalence is estimated at 2–5% for 12-month rates and up to 13% lifetime (Wong & Rapee 2016). On the other hand, up to 50% of individuals with Autism Spectrum Disorder experience comorbid anxiety, particularly SA (van Steensel et al. 2011).

Differentiating Social Anxiety Disorder from Autism Spectrum Disorder in adults is clinically challenging due to overlapping symptoms such as social withdrawal, fear of negative evaluation, and avoidant behavior (Spain et al. 2020). This study aims to assess how personality, cognitive, and autistic traits (AT) affect SA and to define the impact of autistic features on its development.

## SUBJECTS AND METHODS

### Subjects

Seventy-two adults (42 women, 30 men) over 18 with varying social anxiety and autistic traits participated in this study. Participants were recruited from psychotherapists' clients and social media groups focused on social anxiety and autism. Two groups were studied:

- Group A: High SA, low AT (n=26);
- Group B: High SA, high AT (n=25).

### Methods

The following psychometric tools were used:

- Social Anxiety and Social Phobia Questionnaire in order to assess the general level and dominant type of SA (Salagakova & Truevtsev 2012);

- HEXACO-PI-R60 Personality Inventory, which assesses personality traits, developed based on the Big Five components (Ashton & Lee 2009);
- The Hostility Scale assesses traits like wariness, cynicism, and negativism (Cook & Medley 1954);
- Cognitive Styles Questionnaire (CPQS) to study the six cognitive styles (Rusalov & Volkov 2015);
- Autism Spectrum Quotient (AQ) which assesses AT (Baron-Cohen et al. 2001);
- Behavioral Self-Regulation Style to assess the degree of development of conscious self-regulation (Morosanova & Kondratyuk 2020);
- Emotional Intelligence Test (Lyusin 2006).

Statistical methods included descriptive statistics, t-tests, and regression analysis.

## RESULTS

### Social Anxiety

No statistically significant difference was observed in the overall SA scores between the two groups ( $p = 0.16$ ). However, Group B exhibited a higher mean total SA score than Group A. Notably, Group B participants demonstrated significantly elevated SA levels in contexts requiring social initiative (e.g., initiating conversations, assuming leadership roles in group settings) and during evaluative social scrutiny (i.e., situations involving perceived observation or judgment by others). These findings indicate that while the groups may share comparable baseline levels of SA, the specific triggers of anxiety may vary based on autistic traits. As shown in Table 1, Group B displayed

markedly higher scores on the «Initiative» and «Under Observation» subscales of the Social Anxiety and Social Phobia Questionnaire, highlighting these context-dependent differences.

### Autism Spectrum Traits

As anticipated, Group B demonstrated significantly elevated scores across all AQ subscales - social skills, attention to detail, attention switching, communication, and imagination (all  $p < 0.05$ ; majority  $p < 0.001$ ). This consistent pattern of group differences validates our classification approach and underscores the more clinically significant autistic characteristics present in Group B. As detailed in Table 1, participants in Group B exhibited particularly marked difficulties in social skills and communication domains. They also showed stronger preference for detail-oriented processing and encountered greater challenges with cognitive flexibility (attention switching), reflecting core aspects of the autistic phenotype.

### Personality Traits

Significant group differences emerged across several HEXACO-PI-R60 dimensions (See Table 2):

- Lower *Extraversion* in Group B ( $p < 0.001$ ), driven primarily by reduced *Liveliness* ( $* < 0.001$ ), *Social Self-Esteem* ( $p = 0.003$ ), and *Sociability* ( $p = 0.008$ );
- Higher *Honesty-Humility* ( $p = 0.03$ ) in Group B;
- Elevated Hostility-related traits, including *Vigilance* ( $p = 0.013$ ) and *Negativism* ( $p = 0.014$ ) in Group B.

**Table 1.** Markers of Social Anxiety and Autism Spectrum Characteristics

Scales	Group A (n=25)		Group B (n=26)	
	Mean	SD	Mean	SD
<b>Social Anxiety and Social Phobia Questionnaire</b>				
Total social anxiety and social phobia score	54.62	15.87	60.56	14.67
Social anxiety in situations of "being the center of attention, under observation"	12.96	4.43	14.24	4.09
Post-situational rumination and desire to overcome anxiety in expert situations	11.27	2.68	12.08	2.75
Restraint in emotional expression due to fear of rejection and blocking signs of anxiety in expert situations	10.50	2.27	10.96	2.28
Anxiety when showing initiative in formal situations due to fear of criticism and loss of subjective control	10.23	3.55	12.24	3.92
Avoidance of direct contact in subjectively expert situations	11.04	3.80	11.84	4.25
<b>Autism Spectrum Quotient</b>				
Total score ASQ	19.54	4.12	<i>30.00 a</i>	3.16
Social skills	4.23	2.08	<i>7.04 a</i>	1.67
Attention to detail	3.85	1.78	<i>5.48 a</i>	2.92
Attention switching	5.08	1.96	<i>6.96 b</i>	1.81
Communication	3.35	1.79	<i>5.44 a</i>	1.76
Imagination	3.04	1.97	<i>5.08 b</i>	2.29

Note: M (mean) – average value; SD – standard deviation. Statistically significant differences are highlighted in *italics* (a - Student's t-test, b - Mann-Whitney U test)

**Table 2.** Personality Traits Assessment

Scales	Group A (n=26)		Group B (n=25)	
	Mean	SD	Mean	SD
<b>HEXACO-PI-R60 Personality Inventory</b>				
<i>Honesty-Humility</i>	30.50 <i>a</i>	8.10	35.20 <i>a</i>	6.81
Sincerity	9.31	3.18	11.00	3.49
Fairness	9.54	3.88	10.72	3.61
Greed Avoidance	5.15	2.59	5.80	2.60
Modesty	6.50	2.32	7.68	2.36
<i>Emotionality</i>	36.35	6.18	37.04	7.59
Fearfulness	10.46	2.98	10.96	3.42
Anxiety	8.23	1.73	8.92	1.44
Dependence	7.69	1.72	7.88	2.26
Sentimentality	9.96	2.55	9.28	2.44
<i>eXtraversion</i>	25.19 <i>a</i>	8.12	17.76 <i>a</i>	6.72
Social Self-Esteem	7.96 <i>b</i>	3.93	4.84 <i>b</i>	2.25
Social Boldness	7.42	2.77	6.48	3.14
Sociability	5.35 <i>b</i>	2.00	3.72 <i>b</i>	1.95
Liveliness	4.46 <i>b</i>	2.04	2.72 <i>b</i>	1.65
<i>Agreeableness</i>	27.77	6.24	30.24	6.42
Forgivingness	4.54	1.98	5.68	2.85
Gentleness	9.31	2.41	10.24	2.70
Flexibility	7.58	3.14	8.00	2.63
Patience	6.35	2.43	6.32	2.06
<i>Conscientiousness</i>	33.35	7.14	34.52	7.88
Organization	6.35	2.15	6.84	2.27
Diligence	6.00	2.17	5.72	2.26
Perfectionism	10.62	2.95	11.40	2.83
Prudence	10.38	2.70	10.56	3.24
<i>Openness to Experience</i>	34.23	5.56	32.72	8.54
Aesthetic Appreciation	7.38	2.56	7.08	2.61
Inquisitiveness	6.85	1.95	7.04	2.07
Creativity	9.08	2.90	8.56	3.75
Unconventionality	10.92	1.94	10.04	2.30
<b>Hostility Scale</b>				
Vigilance	38.27 <i>a</i>	6.36	42.6 <i>a</i>	5.53
Cynicism	56.38	9.57	59.56	9.72
Negativism	37.12 <i>a</i>	7.12	42.08 <i>a</i>	6.85

Note: M (mean) – average value; SD – standard deviation. Statistically significant differences are highlighted in *italics* (a - Student's t-test, b - Mann-Whitney U test)

Though Group B showed trend-level elevations in *Agreeableness* and *Conscientiousness*, these differences were not statistically significant. This pattern suggests that individuals with marked autistic traits tend to exhibit greater social introversion and lower interpersonal confidence. Moreover, higher baseline *honesty* but also *vigilance* potentially reflect increased sensitivity to perceived threats.

### Cognitive Styles

We observed a statistically significant difference in cognitive reflectivity between groups ( $p=0.026$ ), with Group B demonstrating greater tendency toward reflective thinking. This finding suggests individuals with pronounced AT may engage in more deliberate decision-making processes, carefully weighing options before

taking action. No other dimensions of cognitive style reached statistical significance between groups. Complete statistical comparisons for all cognitive style measures are presented in Table 3.

### Emotional Intelligence

Participants in Group B demonstrated notably lower overall EI scores ( $p=0.026$ ), while the variations in their interpersonal and intrapersonal EI components did not reach statistical significance. These findings indicate that people with marked AT might experience greater challenges in overall emotional perception and regulation, potentially exacerbating their social anxiety symptoms. Specific data supporting these conclusions are presented in Table 3.

**Table 3.** Assessment of Cognitive Patterns and Emotional Intelligence Characteristics

Scales	Group A (n=26)		Group B (n=25)	
	Mean	SD	Mean	SD
<b>Cognitive Styles Questionnaire</b>				
Field Dependence	4.42	1.27	4.40	1.26
Field Independence	6.50	1.17	6.04	1.90
Narrow Range of Equivalence	6.00	1.41	5.40	1.78
Broad Range of Equivalence	4.92	1.55	5.40	1.68
Flexibility of Cognitive Control	5.69	1.54	4.92	2.12
Rigidity of Cognitive Control	4.62	1.63	5.32	1.99
Impulsivity	5.08	1.70	4.44	1.64
Reflectivity	<i>6.42 a</i>	1.47	<i>7.60 a</i>	2.14
Concrete Conceptualization	5.58	1.30	6.36	1.60
Abstract Conceptualization	6.46	1.77	6.16	2.01
Tolerance for Unrealistic Experience	6.54	1.56	5.76	1.83
Intolerance for Unrealistic Experience	5.77	1.50	5.60	2.24
<b>Emotional Intelligence Test</b>				
Total EQ Score	<i>21.23 a</i>	2.67	<i>19.2 a</i>	3.61
Interpersonal EQ	10.92	1.92	9.72	2.39
Intrapersonal EQ	10.31	2.04	9.48	2.37
Understanding Others' Emotions	5.96	1.08	5.52	1.26
Managing Others' Emotions	4.96	1.46	4.20	1.50
Understanding Own Emotions	5.00	1.02	4.48	1.53
Managing Own Emotions	5.31	1.54	5.00	1.53

Note: M (mean) – average value; SD – standard deviation. Statistically significant differences are highlighted in *italics* (a - Student's t-test, b - Mann-Whitney U test)

**Table 4.** Indicators of Self-Regulatory Behavioral Styles

Scales	Group A (n=25)		Group B (n=26)	
	Mean	SD	Mean	SD
Total Self-Regulation Level	83.92	14.01	77.60	13.04
Goal Planning	10.65	3.80	10.76	3.91
Modeling Conditions	12.04	2.85	10.12	2.52
Action Programming	14.31	2.62	15.36	3.00
Result Evaluation	11.31	3.39	11.48	4.03
Flexibility	<i>12.81 a</i>	3.83	<i>8.76 a</i>	3.09
Reliability	8.88	3.15	8.88	3.82
Persistence	13.92	3.39	12.24	3.54

Note: M (mean) – average value; SD – standard deviation. Statistically significant differences are highlighted in *italics* (a - Student's t-test, b - Mann-Whitney U test)

### Behavioral Self-Regulation

The Behavioral Self-Regulation Style questionnaire revealed a notable difference in the Flexibility scale ( $p < 0.001$ ), with Group B demonstrating significantly lower scores. This suggests that people with AT may struggle more with adjusting their behavior to situational changes. Although Group B also showed a lower overall level of behavioral self-regulation compared to others, this difference did not reach statistical significance. These results are summarized in Table 4.

### Predictors of Social Anxiety (Regression Analysis)

Regression analysis identified different sets of predictors for social anxiety in each group:

- Group A (low autistic traits): Significant predictors included low Liveliness ( $p < 0.001$ ), low Sociability ( $p < 0.001$ ), low Modeling of Conditions ( $p = 0.012$ ), high Sentimentality ( $p = 0.002$ ), and high Attention to Detail ( $p = 0.003$ ). These variables together explained 89% of the variance in social anxiety scores.
- Group B (pronounced autistic traits): Significant predictors included low Social Self-Esteem ( $p < 0.001$ ), low Flexibility ( $p < 0.001$ ), low Reliability ( $p < 0.001$ ), high Dependence ( $p = 0.005$ ), and high Field Independence ( $p = 0.003$ ). These variables explained 92% of the variance in social anxiety scores.

Regression analysis revealed distinct predictive factors for SA in the two groups:

**Table 5.** Regression-Based Predictors of Social Anxiety

	Weight	SE	t	p	R	R <sup>2</sup>
<b>Predictors of Model for Group A</b>						
(Constant)	90.84	8.223	11,05	< 0.001	0.943	0.890
Liveliness	-3.14	0.724	-4.33	< 0.001		
Sociability	-2.81	0.657	-4.27	< 0.001		
Modeling of Conditions	-1.29	0.467	-2.76	0.012		
Sentimentality	1.74	0.502	3,46	0.002		
Attention to Detail	-2.35	0.690	-3.41	0.003		
<b>Predictors of Model for Group B</b>						
(Constant)	81.19	5.732	14.16	< 0.001	0.958	0.917
Social Self-Esteem	-2.98	0.490	-6.10	< 0.001		
Flexibility	-1.58	0.351	-4.49	< 0.001		
Reliability	-1.67	0.305	-5.48	< 0.001		
Field Independence	1.77	0.528	3.36	0.003		
Dependence	1.49	0.467	3.2	0.005		

*Note:* Weight (Coefficient,  $\beta$ ) – regression coefficient indicating the strength and direction of the predictor’s effect on the dependent variable; SE (Standard Error) – shows how precisely the coefficient is estimated (the smaller the SE, the more reliable the estimate); t (t-value) – the ratio of the coefficient to its standard error; used to test the significance of the predictor; p (p-value) – the probability that the observed effect is due to chance ( $p < 0.05$  is usually considered statistically significant); R – correlation coefficient, reflects the strength of the relationship between the predictors and the dependent variable; R<sup>2</sup> (R squared, coefficient of determination) – shows what proportion of the variance in the dependent variable is explained by the model (from 0 to 1, where 1 is a complete explanation)

- Group A: Key predictors were reduced Liveliness ( $p < 0.001$ ), lower Sociability ( $p < 0.001$ ), decreased Modeling of Conditions ( $p = 0.012$ ), heightened Sentimentality ( $p = 0.002$ ), and increased Attention to Detail ( $p = 0.003$ ). Collectively, these accounted for 89% of the variance in social anxiety.
- Group B: Significant predictors comprised low Social Self-Esteem ( $p < 0.001$ ), reduced Flexibility ( $p < 0.001$ ), diminished Reliability ( $p < 0.001$ ), elevated Dependence ( $p = 0.005$ ), and stronger Field Independence ( $p = 0.003$ ). These variables explained 92% of the variance in social anxiety scores. A detailed summary of the regression outcomes is provided in Table 5.

## DISCUSSION

The study offers a deeper, more differentiated perspective on the psychological makeup of adults with SA, particularly in relation to varying levels of AT. While no significant difference emerged in overall SA severity between groups, individuals with marked AT (Group B) experienced heightened anxiety in contexts demanding social initiative and situations involving being watched. This points to a distinct sensitivity to certain social stressors within this group - aligning with prior research on adaptation challenges in autism spectrum conditions (Spain et al. 2018).

The elevated scores across all Autism Spectrum Quotient subscales in the group B demonstrate more significant challenges in social interaction, communication, and cognitive adaptability (Carpita et al. 2024). Personality evaluations showed these individuals tend to be more reserved, less self-assured, and excessively

watchful in social situations, displaying greater hostility and negative outlooks - characteristics that likely exacerbate social withdrawal and complicate relationship-building (Kozunova et al. 2023; White et al. 2012).

From a cognitive perspective, individuals with prominent AT showed greater tendency for reflection and reduced adaptability in behavior. The differential cognitive profiles (e.g., higher reflectivity in Group B) support weak central coherence theory in ASD (Happé & Frith 2006), while their lower EI suggests challenges in identifying and regulating emotions, potentially intensifying social anxiety symptoms (Pak et al. 2023).

The cross-sectional design and reliance on self-report measures limit causal inference and generalizability. The non-randomized sampling (psychotherapy clients and social media groups) may introduce selection bias, particularly regarding help-seeking behaviors and symptom awareness. The analysis does not control for potential mediators like childhood trauma or comorbid depression, which may influence SA.

## CONCLUSION

This study significantly advances our understanding of SA heterogeneity. Its key insight - that "social" anxiety may stem from fundamentally different mechanisms in autistic versus non-autistic individuals. While all participants experienced high levels of SA, individuals with comorbid AT showed greater vulnerability in situations requiring social initiative and when being observed, as well as more pronounced deficits in social skills, cognitive flexibility, and emotional intelligence. Regression analysis showed that predictors of SA differ by group. In those with AT (Group B), low social self-

esteem, rigidity, and field independence were most significant, while in the non-autistic group (Group A), low sociability and high emotional sensitivity were key.

These differences underscore the importance of a differentiated, individualized approach to the diagnosis and treatment of SA, taking into account the unique personality, cognitive, and behavioral characteristics of each individual.

Future longitudinal studies should explore causal pathways between SA and AT, while multi-method assessments (e.g., neuroimaging, eye-tracking) could clarify how cognitive styles and personal features mediate these relationships. Cross-cultural validation remains essential to generalize findings.

### Acknowledgements:

We express our sincere gratitude to Professor Paul Cumming of Bern University, Bern, Switzerland, for language review of the manuscript and valuable commentaries.

**Conflict of interest:** None to declare.

### Contribution of individual authors:

Anastasiia Gradszkova: study design, literature review, data collection, statistical analysis, manuscript writing.

Alexey Pavlichenko: manuscript writing, senior authorship.

Olga Karpenko: study design, senior authorship.

All authors approved the final version of the article before its submission.

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