

# High Neuroticism and Propensity of Major Depressive Disorder and Generalized Anxiety Disorder

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**Abstract:** Neuroticism is one of the Big Five personality traits. The features of high neuroticism level have several similarities with symptoms of major depressive disorder and generalized anxiety disorder, which are two major forms of depressive disorders and anxiety disorders. Because of the overlaps, it is proposed that high neuroticism is positively correlated with the diagnosis of major depressive disorder and generalized anxiety disorder. Multiple previous correlational studies proved such correlation through their measures of participants' self-reports and statistical analysis. This indicates that neuroticism level could be a predictor for depression and anxiety. This means earlier and more efficient prevention and intervention of experiencing mental disorders could be enforced through daily assessment of Big Five personality factors. This discovery has a crucial impact on public health. It provides social institutions such as schools and workplaces with accessible and practical methods to assess the mental health issues of their students and staff timely and effectively.

## 1 INTRODUCTION

Mental health issues have become a growing concern and priority for society in recent years. Life pressures, personal experiences, and competition in society can all lead to stress, sadness, depression, and even mental illness. As a result, people have an increasing awareness and concerns of their own mental problems and also the mental health of people around them. Among various prevalent psychology theories, Big Five personality traits are a widely accepted personality model in psychology. It divides personality traits into five main dimensions - openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each of which represents a core personality tendency, and neuroticism is one of these dimensions that would be the main focus of this article. Noticeably, high neuroticism have several symptoms that overlap with the symptoms of depressive disorders and anxiety disorder, two of the most important and prevalent mental disorders. Thus, this essay proposes that there is a propensity of people with high levels of neuroticism to have depressive disorders and/or anxiety disorders, proving through the lens of previous research and experiments in the field of psychopathology. It is hoped that this study will raise

awareness of mental health issues, and expresses the idea that early detection and prevention of depression can be enhanced by testing for neuroticism.

## 2 INTRODUCTION TO THE KEY CONCEPTS

In order to explore in depth the potential relationship between high neuroticism and mental illness, and whether neuroticism level can serve as a predictor of mental illness, it is necessary to clarify the three main psychological terms in detail. Neuroticism was proved to be able to predict people's potential academic or life outcomes (Mata et al., 2018). People with low level of neuroticism are tend to feel calm, emotional stable, secure, and confident about themselves. By contrast, people with high levels of neuroticism are more likely to feel worried, fear, insecure, and self-doubting (Lim, 2023). They are likely to have difficulty in sleeping, feel upset frequently, and experience heart palpitations. This means they would feel pounding or racing heart beat. They would have stronger and more negative reactions to negative events, easier to get stressed out, greater difficulty picking up social cues, and less supportive social networks. These symptoms have

several singularities with the symptoms of depressive disorders and anxiety disorders.

Depressive disorders included different types of depression such as major depressive disorder, dysthymia, premenstrual dysphoric disorder, and anhedonia. Among them, major depressive disorder is the most common and famous type of depressive disorders. It is characterized by symptoms such as low self-esteem, decreased interests, and feeling anxious about daily tasks. People with depressive disorders would have persistent anxious and sad mood, suicidal ideas, frustration and irritability, and sleep disturbances such as insomnia (Bains & Abdijadid, 2023). Major depressive disorder can be caused by many different aspects such as environmental factors, biological factors, personal experiences, and social factors. The main personal experience or psychological factors can include traumatic childhood experiences, parenting styles, high social expectations, and stressful or harsh upbringing environment.

Anxiety disorders include generalized anxiety disorder, panic disorder, separation anxiety disorder, social anxiety disorder, and specific phobias. The main focus of this article is generalized anxiety disorder, which has symptoms such as excessive worries about at least two domains such as health, natural disasters, family members, and school, and the patients cannot control such worries. They would also experience sleeping problems, increased heart rate, restlessness, irritability, headache, and fatigue (DeMartini et al., 2019). Separation anxiety disorder refers to the symptoms of excessive distress when the patients are separate from their attachment figures. They would have excessive worry about possible harm to attachment figure, or to themselves during the separation. Thus, patients with separation anxiety disorder are commonly children or adolescents rather than adults. Physical symptoms such as headaches and fatigue also accompany their anxiety (Clinic, 2024). Social anxiety disorder's symptoms are patients' excessive anxiety toward social situations. They exhibit avoidance of these situations which may involve fear of judgment or humiliation.

### 3 RELATIONSHIP BETWEEN NEUROTICISM AND MAJOR DEPRESSIVE DISORDER

Scholars in the field of psychopathology noticed the overlapping symptoms of high neuroticism and major depressive disorder, such as persistent sad mood and

sleep problems. They proposed that neuroticism levels have profound significance in predicting public health (Lahey, 2009). Such significance is mainly because features of neuroticism provide the vulnerability required for the diagnosis of multiple mental illnesses, including depressive disorders and anxiety disorders (Widiger & Oltmanns, 2017). This indicate that there might be a correlation between neuroticism level and the diagnosis of major depressive disorder. In such way, assessment of neuroticism can be used as a predictor for depression level, and more timely intervention and prevention of mental illnesses could be implemented.

One previous study demonstrated the correlation between neuroticism and the degree of depression. This study measured and analyzed the factors through two large population-based cohorts - Generation Scotland: Scottish Family Health Study (GS:SFHS) and UK Biobank. The GS:SFHS included 19,200 participants from Scotland, aged 18-98 years. The UK Biobank included 90,529 participants, aged 40-69 years. From the two cohorts, the researchers selected individuals with complete data for analysis. Participants completed questionnaires during both clinical assessments. They provided the information of their mental health, cognitive ability and demographic conditions. During this process, the Eysenck Personality Questionnaire Short Form-Revised (EPQ-SF) was used to measure participants' neuroticism levels. Neuroticism in the Eysenck personality is not exactly the same as neuroticism in the Big Five personality, but the basic characteristics are the same. In the questionnaire, participants rated their feelings. Those who received higher scores on the questionnaire had higher levels of neuroticism. At the same time, the Patient Health Questionnaire-9 (PHQ-9) and the General Health Questionnaire (GHQ-28) were used to assess their levels of psychological distress and depressive symptoms. Higher scores indicate more severe depression levels. The researchers also recorded the their intelligence level (g) through standardized cognitive tests such as the Wechsler Digit Symbol Substitution Task and the Mill Hill Vocabulary Test (Navrady et al., 2017).

Researchers then calculated and compared the data using statistical methods such as the MCMCglmm package and generalized linear regression analyses. The results showed that there was a significant positive correlation between high neuroticism levels and depressive symptoms. Participants with high levels of neuroticism are more likely to experience depression and psychological distress. This proves the correlation between high neuroticism and major depressive disorder. Another

focus of this research study was intelligence, it also found that intelligence seemed to decrease the association between neuroticism and self-reported depression levels. This suggests that intelligence may be able to alleviate the psychological stress associated with high neuroticism (Navrady et al., 2017). The study did not control whether or not the participants engaged in psychotherapy. Therefore, individuals with higher intelligence may be less depressed because they were more likely to seek out relevant treatment, and thus have fewer depressive symptoms.

The association between high neuroticism and depressive symptoms was also found in a study conducted on Chinese college students. 1,238 undergraduate students from a university in Harbin, China, served as the study's subjects. 1,233 participants remained after those who did not fit the age limit were eliminated. By asking participants to complete questionnaires, the researchers investigated the connections between neuroticism, anxiety, depression, and life satisfaction. The Big Five Inventory-2 (BFI-2) questionnaire was used to gauge their degree of neuroticism and the Big Five personality traits, while the Self-Rating Depression Scale (SDS) was utilized to gauge their depression. The participants were split into two groups according to the neuroticism test mean score of 32.38. Participants in the high neuroticism group had scores higher than the mean, while those in the low neuroticism group had scores lower than the mean. The data was then compiled into graphs and charts to compare the two groups' degrees of depression. The t-test results showed substantial differences in depressive symptoms between the two groups. The mean scores for the majority of symptoms associated with depression were greater in the group with high neuroticism. Thus, this study also confirmed the finding that major depressive disorder experience is positively correlated with high neuroticism (Tang et al., 2023).

These studies highlight some important takeaways for public health and clinical practice. By showing a clear link between neuroticism and major depressive disorder, researchers point out the value of early assessment and intervention. Screening for neuroticism could be a practical way to identify and predict individuals at high risk for major depressive disorder at an early time. Thus, it enables these individuals to take timely prevention and actions to reduce the propensity before symptoms get worse.

On top of that, the findings also show how personality traits, cognitive abilities, and mental health can all interact in complex ways. For example, the first study of intelligence, neuroticism, and

depression proved the correlation between high neuroticism and depressive symptoms, and also mentioned that intelligence might reduce the impact of neuroticism on depression. This could offer a new angle for preventing mental health issues by focusing on neuroticism. This suggests that improving intelligent skills could diminish the psychological stress related to high neuroticism, and help reduce the intensity of depressive symptoms. Although the clear association between intelligence and mental illnesses is still unclear and needs further studies, this could be a helpful insight for the treatment of major depressive disorder.

#### 4 RELATIONSHIP BETWEEN NEUROTICISM AND GENERALIZED ANXIETY DISORDER

High neuroticism also has overlapping symptoms with generalized anxiety disorder, such as persistent worries, sleep disturbances, and heart problems. One previous twin study demonstrated the existing association between high neuroticism and generalized anxiety disorders. The researchers wanted to determine whether neuroticism is a risk factor for internalizing disorders including generalized anxiety disorder. The use of a twin design effectively separated genetic and environmental influences. A large number of twin pairs were included in the study to ensure a diverse sample. The twins were asked to do assessments, where they used self-reported Eysenck Personality Questionnaire to measure their neuroticism levels and a diagnostic interview to identify internalizing disorders. Finally, the researchers used multivariate genetic analysis, the software package Mx, and independent pathway models to calculate the results. The study concludes that neuroticism is indeed an important risk factor for the development of internalizing disorders including generalized anxiety disorder. The results of the twin study also suggest a significant genetic component to both neuroticism and internalizing disorders (Hettema et al., 2006).

A study done at UCLA and Northwestern University also showed that young people with high levels of neuroticism were more likely to have a predisposition to anxiety disorders. Researchers suggest that people with high neuroticism tend to show more negative emotions such as anxious, sad, and stressful, as well as higher vulnerability and sensitivity to negative events. The study selected 547

senior students from two high schools in Chicago and Los Angeles. Participants were also asked to take questionnaires. The results of the study showed a positive correlation between neuroticism and generalized anxiety disorder. Therefore, the researchers state that neuroticism may be useful to predict internalizing disorders such as generalized anxiety disorder and major depressive disorder (Anyaso, 2016).

In 2020, another research project investigated interpretative bias and neuroticism levels as warning signs for internalizing diseases such as generalized anxiety disorder. The researchers hoped to understand how neuroticism affects interpretive bias, and how this bias influences mental health outcomes over time. The study involved a group of college students. Initially, 1,269 students were invited to participate, focusing on those who were likely to develop mood and anxiety disorders based on neuroticism scores. Ultimately, 668 students agreed to participate, 627 of them completed the baseline assessment. The research study utilized a longitudinal design. The task for assessing participants' interpretive bias was implemented approximately six years after the baseline assessment. Their interpretive-bias was assessed through their answers to 20 scenarios, which included filler tasks and ranking questions of social and nonsocial situations. In the study, the Mood and Anxiety Symptoms Questionnaire was used to assess their level of anxiety disorders symptoms. Multiple self-reported measures were used to construct participants' hierarchical neuroticism model, such as the International Personality Item Pool-NEO-PI-R, The Behavioral Inhibition Scale, and the Big Five Mini-Markers Scale (Vinograd et al., 2020).

After collecting the data, the researcher conducted a regression analysis. The result indicated that neuroticism significantly predicted a general distress dimension. It also showed that neuroticism was a helpful predictor of negative interpretations in social situations. The study concluded that neuroticism could reflect an increased risk for anxiety disorders, but interpretive bias did not serve as a mediator of this relationship. This study fills the gap in understanding the longitudinal relationship between neuroticism levels and internalizing problems, and indicates the complexity of how neuroticism may contribute to mental health problems (Vinograd et al., 2020).

These previous studies and their evidence revealed the positive association between neuroticism and generalized anxiety disorder. This highlights the importance of treating neuroticism as a predictor for intervention of mental illnesses. As the twins study revealed that neuroticism has a genetic component, it

conveys the importance of future research of biological mechanisms behind this trait. For example, exploring specific genes or neural pathways associated with neuroticism and generalized anxiety disorder may provide new evidence of why individuals with higher neuroticism are more likely to experience anxiety disorders. These explorations could lead to more innovative and effective treatments for intervening mental illnesses, through the testing of neuroticism levels. The important influence of shared and non-shared environmental factors also suggests that regulations of stressors in daily life may help reduce the risk of developing generalized anxiety disorder in individuals with high neuroticism. Furthermore, the study of high school students focused on a younger demographic - the approximate age range of American high school senior students is between 17-19 years old. This focus on a younger group proves that the relationship between neuroticism and anxiety disorders is not only in adults, but also in the adolescence. This demonstrates the age generalization of this correlation.

## 5 DISCUSSION AND SUGGESTION

This article aims to examine the relationship between neuroticism and depression and anxiety. People with high neuroticism are characterized by high sensitivity and vulnerability to negative stimulus and emotional distress, which may make them more susceptible to developing depressive symptoms. Overlapping features between neuroticism and depression, such as persistent worry, emotional instability, and sleep disturbances, provide a basis and motivation for proposing the hypothesis and conducting the researches.

These previous studies are very similar in their approaches. First of all, they all took participants from a specific population, such as adults in Scotland and UK, high school seniors in Chicago and Los Angeles, and twins. Also, the methods for these studies were all through self-reported questionnaires. Different questionnaires were used to assess participants' levels of neuroticism, depression, and anxiety. Moreover, the researches are also similar that the data were all collected and analyzed through statistical methods such as regression calculations and the production of graphs and charts. The conclusions they came up with were similar that high

levels of neuroticism were positively correlated with depression and anxiety.

Such similarities contribute to several limitations of these studies. Because of these studies' similar correlational choices of research methods, the conclusions they draw can only be about correlation, but could not a direct cause-and-effect relationship between high neuroticism and the diagnoses of mental illnesses. Thus, these studies cannot tell if neuroticism causes major depressive disorder and generalized anxiety disorder or if there is a bidirectional relationship between neuroticism and the two mental illnesses. Also, these studies relied on self-report measures, which may introduce response bias in the answers. For example, participants may answer base on social desirability or inaccurate self-assessment. For instance, some of them may think that they do not want to be associated with high level of depression or anxiety, since this does not align with the social expectation they received from their families. Therefore, they may disguise their real feelings and rate themselves lower in depression and anxiety levels. They might also anticipate the goals of the researches and choose the answers more align with the goals, such as choosing answers that indicate higher level of depression, although they might not actually feel that depressed.

Thus, future research studies can aim to explore a more direct and causal relationship between neuroticism and the two mental illnesses. This could provide more convincing evidence for neuroticism as a predictor of depressive disorders and anxiety disorders. For example, future researches can develop effective methods for constructing experimental designs to assess individuals' neuroticism levels and their depression and anxiety symptoms. Designing experiments for studying the hypothesized relationship could be difficult, since unbiased and valid experiments require blinded studies, disguise to the participants, and the elimination of confounding variables. These requirements may be difficult to practice in real life. However, the success in constructing such experiments could be a crucial progress in demonstrating the more direct and causal relationship between neuroticism and mental illnesses. Also, if experimental studies are difficult to carry out, longitudinal studies that track the changes of variables over time could be helpful in providing more evidence of causality. This could be helpful for institutions to provide timely interventions and prevention regarding people's mental health issues, and raise the overall awareness about mental health problems among the public.

## 6 CONCLUSION

In conclusion, the characteristics of high neuroticism overlap with several symptoms of major depressive disorder and generalized anxiety disorder. Thus, the hypothesis that highly neurotic people have a tendency to also experience psychological disorders was proposed. Adequate correlational studies have successfully demonstrated a positive correlation between high neuroticism and the two mental illnesses. While more future research is essential, these evidence is still significant. They suggest that neuroticism can be used as an effective screening tool to identify people at risk for major depressive disorder and generalized anxiety disorder. By evaluating an individual's neuroticism level, those who may have the propensity for mental illnesses can be identified earlier, so that earlier preventative strategies can be developed more timely. This could increase social institutions' awareness of assessing people's mental health and provide them with accessible way to do it through Big Five personality inventories. This deepens the understanding of how personality traits reflect the propensity of mental illnesses, and highlights the importance of early detection and intervention.

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