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**GENDER AS AN ENVIRONMENTAL STRESSOR IN INDIVIDUALS GENETICALLY
PREDISPOSED TO MOOD DISORDERS: A PRELIMINARY ANALYSIS**

**Gender as an Environmental Stressor in Individuals Genetically Predisposed to Mood
Disorders: A Preliminary Analysis**

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WGSS 335: Masculinity in American Culture

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12 December 2022

Gender as an Environmental Stressor

Given the recent 'epidemic' of mental health disorders, we urgently need to better understand who is suffering and how. One aspect of this that research has come closer to identifying is where symptoms and diagnoses are missed in certain individuals, especially based on gender. However, if certain genders are actually more likely to deal with certain disorders we need to understand why and where that comes from. There is a general consensus in the medical field that some individuals are simply genetically predisposed to various disorders based on sex, but there is limited evidence that sex actually determines genetic predisposition. Additionally, key research findings indicate that the role of environmental stressors is crucial in determining whether even a predisposed individual will actually present symptoms to a point of a diagnosed disorder. Therefore, if there is such a measurable difference between men and women in the presentation and diagnosis of certain psychiatric disorders, gender must be considered as a potential environmental stressor itself which might compound predisposition and lead to an actual difference in the rates of certain types of disorders by gender. ADHD and clinical depression are two specific psychiatric disorders that are widely associated with men compared to women and vice versa. Therefore, they will serve as benchmarks to analyze gender differences in psychiatric disorders and potential factors like genetic predisposition and gender itself. If there is a truly measurable difference between the actual rates of prevalence of these disorders based on sex, gender itself must be considered as an environmental stressor that might compound factors like genetic predisposition, leading to the presentation of certain symptoms and diagnoses in different individuals.

The current understandings of psychiatric disorders and gender center around two factors. First, there are consistently differences in the rates of certain disorders by gender. Women are

more likely to be diagnosed with mood disorders like depression or anxiety, but men are more likely to be diagnosed with ADHD or Oppositional Defiant Disorder. According to the National Mental Health Institute, 10.5% of women reported experiencing a major depressive episode lasting at least two weeks, whereas only 6.2% of men reported the same in the year 2020 (NIMH 2020). However, more recent considerations of how these disorders and gender interact suggest that the data supporting a difference between genders in the reported rates of both disorders might be inaccurate. Many researchers theorize this is an effect of missed diagnoses for some individuals depending on the nature of the disorder and the way it presents symptomatically; in other words, if a person's gender performance does not align with the type of symptoms we expect to see from a certain disorder, that person may not receive an accurate diagnosis in a timely manner or at all. Nevertheless, with the known data there is a large difference in rates of prevalence between genders on certain types of disorders. Even with the possibility that some of these gaps might be filled by more accurate assessments of symptoms which would lead to more frequent accurate diagnoses, there must still be research into what other factors might cause the gap.

Several studies in recent decades have examined a possible genetic basis for psychiatric disorders like depression and ADHD alike. That psychiatric disorders might be hereditary is not a new discovery; scientists have even been able to target certain genes in both animals and humans that might indicate a higher predisposition for mood disorders like depression. For example, polymorphism in the *CACNA1C* gene has previously been linked with psychiatric disorders like depression and schizophrenia, and even in healthy individuals variations of this gene correlate with brain activity associated with executive functioning. A research team led by David T. Dao in 2010 ran an experimental study on mice with different variations of the gene to

analyze how their behavior during various stress-inducing trials might differ based on their sex and the variant expressed in their genome. The results showed that *CACNA1C* gene variations correlated with bipolar disorder and depression symptoms in male and female mice, but only female mice with the variation experienced additional symptoms like anxiety while also displaying decreased evidence of learned helplessness and startle responses to sudden noise. Specifically, the results showed that in female mice alone, a variation of the gene involving an insufficiency of certain cells as it mutates correlated significantly with depressive symptoms. Researchers found similar correlations between *CACNA1C* genetic variation and the presence of these symptoms respective to sex in humans with a mood disorder diagnosis, as well (Dao et al 2010). A study from 2019 by Jennifer Rainville and Georgia Hodes targeted specific genes linked with the immune system response in human participants and found measurably different inflammation responses in women compared to men in response to stress. These researchers linked that difference to chromosomes and to hormones like estrogen, progesterin, and androgen in both standard immune responses to infection and to stress. They asserted that differing interactions between the immune system and the brain by sex increased throughout development as hormonal differences between sexes increased. Like the 2010 study found in mice and later in humans, Rainville and Hodes concluded there is a significant interaction between sex and genetic variation which predisposes an individual to experience symptoms of mood disorders like depression (Rainville & Hodes 2019).

However, a prior study led by Ahmad Hariri in 2005 found even distribution of both genetic variation and mood disorder symptoms in men and women. This research team utilized an fMRI (functional magnetic resonance imaging) study to analyze common variations in a gene responsible for serotonin regulation, *SLC6A4*. The amygdala, an area of the brain responsible for

the 'fight-or-flight' response and emotional regulation, demonstrated increased activity to stress in both healthy subjects and those who displayed symptoms or a diagnosis of a mood disorder depending on the variant of the gene expressed in their genome. These results did indicate that the gene itself might play a role in the effectiveness of an individual's response to a stressful situation even long-term, but with this specific gene which plays such a key role in emotional regulation there was no inherent difference between sexes. Therefore, these researchers indicated that gender differences in the prevalence of mood disorders are likely due to a different factor than simply genetic predisposition (Hariri et al 2005). Even though there are data to indicate genetic predisposition might lead to an unequal expression of mood disorder symptoms in women compared to men, the data is not conclusive enough to make an assumption that variation in specific genes alone is different in one sex or another. Current research is certainly not conclusive enough to form the simplistic assumption that genetic predisposition by itself by sex is enough to account for the different rates of mood disorder by gender.

A key factor long associated with genetic predisposition in the presentation of psychiatric disorder symptoms is the environment one encounters throughout their life. Current understandings indicate a consistent relationship between genetic predisposition and lifetime environmental stress as a predictor of the developed stress response and even mood disorder susceptibility of individuals (Agid et al 2000; Verma et al 2011). Again, even in individuals who do not have a diagnosis for any psychiatric disorder, there tends to be differences in several physiological and emotional reactions to stressors between men and women. Researchers have claimed this indicates key differences between sexes based on actual genetic differences in healthy individuals and then especially in individuals with mood disorders. However, because genetic predisposition and the environmental stressors one encounters are so closely linked as

joint factors in one's emotional development, it would be inaccurate to claim one or the other is a primary factor. Therefore, while there is clearly a wide basis of findings indicating the role of genetic predisposition, we must also take into account the environment that each individual interacts with throughout their lives. Gender itself is one aspect of our environment that is present consistently in virtually every facet of our lives. What role might gender play, then, as an environmental factor or even an environmental stressor?

According to a study conducted by Michael Robinson and Joel Johnson among college students, men and women perceive their own emotions and those of others differently based on gender identity. In fact, these researchers found that separate words are used to describe the emotional experiences of men and women respectively, with men using words like "stressed" to describe themselves and other men and women using words like "emotional" to describe themselves and other women. However, individuals report themselves as aligning closer to an average level of emotion than others of their own gender (Robinson & Johnson 1997). This indicates that conscious awareness of gender norms and the comparison between one's true identity and their expected gender performance directly impacts the way men and women view and even experience their own emotions. Additionally, research conducted for the United Nations committee on Gender Equality, Norms, and Health Steering demonstrated that gender as a complex social structure creates an environment where access to both mental and physical health is limited depending on an individual's gender. This report analyzed factors like gender inequality and even gender norms themselves alongside the intersections of factors like class and race. The researchers asserted that the structure of healthcare systems integrate gender norms and inequality into the treatment of patients from birth (Heise et al 2019). While this report focused mostly on physical rather than psychological health and wellbeing, it still challenges the notion

that there is some physiological difference inherent to one sex or another that leads to unpreventable negative outcomes. Instead, the structure of our social environment influences individuals who may already be predisposed to a certain issue, whether it be physical or mental health, to actively experience the negative impacts of that issue because of their gender, not because of a concrete factor like their sex. With these conclusions, there is a strong indication that gender itself can be considered an environmental stressor.

For women, gender as an environmental stressor presents as a form of anxiety related to living up to normative feminine standards. In 1992, researchers Betty Gillespie and Richard Eisler from Virginia Polytechnic Institute identified feminine gender role stress (FGRS) to demonstrate how women experience and appraise the stress of adhering to the gendered norms expected of them. The scale itself measured both men and women's responses to daily situations which would most likely be associated with feminine gender role expectations. These daily situations were based around five different aspects of gender roles which are traditionally assigned to women: a fear of unemotional relationships, a fear of physical unattractiveness, a fear of victimization, a fear of behaving assertively, and a fear of not being nurturant. Consistently and as expected, women reported experiencing more stress from these scenarios than men. Furthermore, this research found that women who had high FGRS reported higher levels of depression and more difficulties dealing with daily stress (Gillespie & Eisler 1992). These conclusions help demonstrate that typically feminine gender norms are not necessarily beneficial for women but instead actively cause psychological distress and even harm. Additionally, this suggests that these traits are not inherent to women but actually a product of a social environment which expects these traits of women.

Later in 2015, a research team led by Katherine Richmond published a study which used the Feminine Ideology Scale (FIS) to see if there is a measurable relationship between anxiety in women and their adherence to feminine ideology, and how much of a role feminine gender role stress had on that relationship. These researchers analyzed discrepancy strain in women, or the psychological distress felt when one does not live up to a normative standard. The FIS measured stereotypic image and activities, dependency/deference, purity, caretaking, and emotionality; however, the dependency/deference factor was eliminated post analysis. This study concluded that the FIS and another measure are valid self-report metrics that professionals can and should use to assess whether or not gender role stress is compounding a female patient's symptoms of a mood disorder or anxiety in order to better treat her. In fact, the results showed that women who reported stronger adherence to feminine ideology did in fact experience higher levels of anxiety if they also experienced comparatively high levels of gender role stress (Richmond et al 2015). Again, this not only demonstrates that the pressure to adhere to normative femininity increases stress in women, but demonstrates that gender as that environmental stressor can be measured as well as managed in order to relieve the symptoms of psychological distress either alone or alongside an official disorder.

For men on the other hand, emotions are most often expressed through aggression and hyper-productivity due to the nature of hegemonic masculinity. Similar to the Feminine Gender Role Stress scale developed by Gillespie and Eisler in 1992, Richard Eisler studied Masculine Gender Role Stress (MGRS) along with Janice Blalock in 1991. They studied behaviors such as the inhibition of emotional expressiveness, reliance on aggression, power, and control, and obsession with achievement and success. These researchers found that men experiencing high levels of masculine gender role stress tend to rely on emotionally repressive coping mechanisms

in response to strong emotions and life stressors. Eisler and Blalock theorized that this stemmed from masculine gender norms themselves, and this makes sense. The emotional nature of mood disorders, especially in the general public's conception, is the barrier to an accurate diagnosis and to effective treatment for men with depression because emotional detachment is a hallmark of hegemonic masculinity. Numerous characteristics represent what masculinity is in our culture, and as scholar Sharon Bird identifies there are different forms that masculinity can take depending on the individual. However, men are constrained by masculinity throughout their lives and certain characteristics are simply non-negotiable.

The consequences for presenting and behaving outside of hegemonically masculine ideals vary, but the general expectation of most men is to align with their culture's standards and repress the parts of their identities which do not fit. Therefore, regardless of how intensely men actually experience emotions even to the point of developing a mood disorder, oftentimes they will express them in a far more detached way even to the point of anger in favor of attaining a sufficiently masculine image (Bird 1996). Men across different cultures and backgrounds will experience this to varying degrees. A research team led by Christopher Chuick in 2009 looked into how men with depression actually describe their personal experiences. Just as Eisler and Blalock's theories would predict, the men interviewed in this study reported behaviors correlated with emotional detachment and attempts to resolve the symptoms of depression on their own, which led to destructive coping strategies and no improvement in symptoms overall. Interestingly, these men directly reported that environmental stressors paired with their own destructive coping strategies worsened their experience with depression. For many of these men, they only sought outside help from loved ones or professionals once their productivity at work was disrupted by their symptoms (Chuick et al 2009). Therefore, there is solid evidence that the

expectations of hegemonic masculinity compound emotional and psychological distress in men, especially in men who already experience symptoms of depression. At the same time, however, the emotional detachment that is a key part of ascribing to hegemonic masculinity prevents these men from seeking help. Overall, both men and women suffering from symptoms of mood disorders like depression experience worsened symptoms when they also experience high levels of stress related to maintaining their ascription to their respective normative gender roles. Gender itself might therefore be an environmental stressor.

There is not currently enough research examining either gender's experience with gender role stress and mood disorders to conclude whether or not gender role stress can conclusively be considered an environmental stressor that actively increases these symptoms in women or in men. However, studies should be done with participants who are genetically predisposed to certain mood disorders to see if there is a direct correlation in those individuals between gender role stress levels and the likelihood of actually developing symptoms and receiving a diagnosis. From there, further research could investigate if a causal relationship exists. In conclusion, while women are more likely to experience mood disorders like depression according to current data, we must not only take into account how gender impacts the way these disorders present in men compared to women, but also how gender norms might actually exacerbate these symptoms in predisposed individuals. Moving forward, until researchers understand gender as a potential environmental stressor itself, care must be taken to mitigate any gender role stress in patients suffering from psychiatric disorders to prevent further harm.

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