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Superior Intelligence - A Risk Factor for Psychological and Physiological Hyperactivity

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Abstract: ***High intelligence is said to predict beneficial outcomes such as school success and income level. However, little is known about the difficulties that this demographic faces. Individuals with a high intellectual capacity (hyper brain) have over excitabilities in different domains, which may predispose them to specific psychological problems as well as physiological conditions including heightened sensory, altered immunological, and inflammatory responses (hyper body). The current study surveyed American Mensa, Ltd. members (n = 3715) to investigate psycho neuro immunological (PNI) processes in persons at or above the 98th percentile of IQ. Participants were asked to self-report the prevalence of mood and anxiety disorders, attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), and physiological ailments such as environmental and food allergies, asthma, and autoimmune disease. When compared to national average statistics, the Mensa group 2015 data confirmed great statistical significance and a notably high relative risk ratio of diagnoses for all evaluated disorders. This suggests that a high IQ may be a risk factor for affective disorders, ADHD, ASD, and an increased incidence of disease associated to immunological modulation. Preliminary findings strongly indicate a hyper brain/hyper body relationship, which may have significant individual and societal ramifications and need additional research to appropriately identify and treat this at-risk population.***

Keywords: Intellectual capacity, Over excitabilities, Psycho neuro immunological processes, Affective disorders, Immunological modulation

1. Introduction

Intelligence quotient (IQ) is generally touted as a gift predicting exceptional outcomes in many domains including educational attainment and income level (Bergman, Corovic, Ferrer-Wreder, & Modig, 2014) and is a positive indicator of high system integrity (Gale, Hatch, Batty, &Deary, 2009; Gale, Batty, Tynelius, Deary, & Rasmussen, 2010; Gottfredson, 2004; Lubinski & Humphreys, 1992; Wraw, Deary, Gale, & Der, 2015; Wrulich et al., 2013). However, there are conflicting studies in the literature that suggest a link between gifted IQ, particularly high verbal ability, and a variety of mental and immunological outcomes such as depression (Jackson & Peterson, 2003; Wraw, Deary, Der, & Gale, 2016); bipolar disorder (Gale et al., 2013; MacCabe et al., 2010; Smith et al., 2015); anxiety disorders (Lancon et al., immune disorders (Benbow, 1985, 1986); and autism spectrum disorder (ASD) (Clark et al., 2016). These seemingly contradictory outcomes may be partially reconciled by examining the field of psychoneuroimmunology (PNI), which investigates how the stress response to the environment, particularly chronic and sustained stress, influences communication between the brain and immune system (Ader, 2001). This study adds to the existing literature on PNI and a variety of physiological and psychological diseases by examining if greater intelligence is associated with higher incidence rates. This is an important contribution because most research on intelligence and numerous diseases focuses on those with low intelligence to normal IQ scores rather than those at the upper end of the scale. To study these linkages, we looked at whether the prevalence rates for mood disorders, anxiety disorders, ADHD, allergies, asthma, autoimmune illnesses, and ASD were greater in 2015 than the published national averages. The links between intellectual overexcitement and each of these diseases are then addressed.

Intellectual over excitabilities

Kazimierz Dabrowski, a Polish psychiatrist and psychologist, coined the term "over excitability." He is most known for his theory of positive disintegration, which arose from examining people with high cognitive abilities throughout their lives in order to understand their higher degrees of emotional development (Dabrowski, 1964a, 1964b, 1966; Dbrowski, 1976). His term is an English version of the Polish word nadpobudliwosc, which means' super stimulatability.' Dabrowski discovered these hyper-reactions in the intellectually gifted with more frequency and power than in those with a normal or lower IQ. Bright people, according to his clinical observations, tended to be "neurotically allergic or nervous," a condition he found to be virtually absent in the cognitively retarded. They displayed a distinctively enhanced method of experiencing and responding to their surroundings across five domains: psychomotor, sensory, intellectual, imaginative, and emotional. He discovered that these over excitabilities were linked to personality development, as well as signs of moderate neuroses such as depression, mild anxiety, and tics, as well as psychological illnesses such as attention deficit/hyperactivity disorder (ADHD). Michielsen et al. (2013) examined adults for symptoms of ADHD, depression, and anxiety during a 6-year period in a longitudinal research. The scientists discovered that people with ADHD were more likely to develop both of these affective disorders. Furthermore, Kessler et al. (2006) discovered that adults with ADHD frequently have co-occurring mental illnesses, such as anxiety (47%) and mood (38%) disorders. Notably, persons with high intelligence who have psychomotor overexcitabilities are more likely to

be diagnosed with ADHD due to a lack of common information about this OE. This diagnosis frequently inhibits people from being correctly classified as having a gifted intellectual potential.

Physiological overexcitabilities:
Psychoneuroimmunology
Many unique connections between psychology and immunity are being uncovered as the area of PNI evolves and develops (Ader, 2001). Even commonplace stimuli, such as a garment tag or a familiar but unusual sound, might become physically uncomfortable for highly intellectual persons with hyper excitability. Continuous, seemingly tiny insults like these can simulate low-level, chronic stress, triggering an incorrect immunological response. The body, like other environmental hazards such as an infection or poison, believes it is in danger. When the sympathetic nervous system is chronically activated, it is in a constant state of fight, flight, or freeze, which causes a series of changes in the brain and body that can disrupt immune function (Glaser et al., 1992; Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Padgett & Glaser, 2003). We are finding that stress has a significant impact on the immune system's ability to defend us, and the consequences can take various forms, including allergies, asthma, and autoimmune illness (Nasr, Altman, & Meltzer, 1981). While there is empirical evidence that mood disorders are associated with immune regulation, researchers have produced conflicting results as to whether this dysregulation contributes to the pathophysiology of depressive disorders (Postal & Appenzeller, 2015; Young, Bruno, &Pomara, 2014) or whether depressive disorders increase susceptibility to immune-related disorders and health conditions such as infection, allergy, and autoimmune diseases (Kronfol, 2002; Sansone & Sansone, 2002). Evidence for the latter is persuasive, given that chronically stressful stimuli have been demonstrated to elicit altered immune function in both human and animal models (Padgett & Glaser, 2003).

Autism spectrum disorder (ASD) is a condition that affects The link between extremely intellectual people and ASD has just been reexamined, but it is far from new. Dr. Leo Kanner described classic autism in 1943 as children who were highly intelligent and able to remember and reproduce complex patterns but also displayed "a powerful desire for aloneness" and "an obsessive insistence on persistent sameness" (Kanner, 1943, p. 249). Kanner discovered a common denominator among the youngsters he studied: they all hailed from highly intelligent households. Four of the 11 fathers were psychiatrists, two were lawyers, and the rest were a chemist, a plant pathologist, a professor, an engineer, and a successful business tycoon. Nine of the eleven mothers had a college education. Kanner described both parents and grandparents as "obsessive," and "strongly preoccupied with abstractions of a scientific, literary, or artistic nature" (p. 250). Soon after, in 1944, a German scientist called Hans Asperger identified a milder, higher functioning version of Kanner's disease, which became known as Asperger's syndrome. Again, he found cases of exceptionally talented boys who struggled with social interactions and certain obsessive hobbies. Asperger referred to his young patients as "little professors" because he believed they would be capable of great success and unique thought later in life (Asperger, 1944/1991; Frith, 1991).Participants included 2213 men (60%), 1472 women (40%), 22 non-cisgender people, and 8 people who declined to state their gender. In terms of race, 87.9% of those polled identified as European Americans, 2.7% as Asian Americans, 2.6% as Hispanic or Latino, 1.6% as African Americans, and 5.2% as other, mixed race, or did not respond. Participants ranged in age from 18 to 91 years (M = 53, SD = 15.18).As a result, the majority of the participants were older, male, and European American.

Hyper brain/hyper body theory
To the best of our knowledge, no research have looked at the potential psycho neuro immunological interactions between each of the characteristics listed below. The purpose of this exploratory study was to cast a wide net in order to identify potential correlations. We set out to answer the question, "Is there a relationship between heightened cognitive capacity (hyper brain) and heightened psychological and subsequent physiological immune responses (hyper body)?"In comparison to the national norm, we looked at the prevalence of mood and anxiety disorders, ADHD, food and environmental allergies, asthma, autoimmune illness, and ASD in those with high intellect. We give data to support our hypotheses that high intellectual capacity is a risk factor for each of the aforementioned psychological and physiological problems, and we propose that the current findings be replicated.in alignment with a novel, hyper brain / hyper body theory.

2. Method

Participants were members of American Mensa, Ltd., a society open to those who have achieved a verified score in the top 2% of the general population on an accepted intelligence test that has been professionally administered and supervised at some point in their lives. Because there are so many tests with varying scales, American Mensa, Ltd. has chosen a percentile rather than a score as the cutoff to avoid misunderstanding. Although the American chapter of Mensa has 55,000 members, only 20,000 of them are available as study subjects. These members had previously accepted to engage in general research projects and had not been specifically solicited to participate in this study. The response rate was between 20 and 25% because over 5000 users entered the site (4328 members consented to the survey). A 25-30% response rate is estimated for an email survey request with no follow-up (Kittleson, 1997). Of those recruited, 4931 (about 10% of the American Mensan, Ltd. population) replied to the invitation, which was issued directly to each individual via email with a direct link to the poll by American Mensa, Ltd. We omitted individuals who (a) did not grant consent, (b) did not complete the survey, and (c) did not read the sections on allergies and/or psychological problems entirely.This left 3715 participants who had completed the survey sufficiently for our analysis. Participants included 2213 men (60%), 1472 women (40%), 22 non-cisgender people, and 8 people who declined to state their gender. In terms of race, 87.9% of those polled identified as European Americans, 2.7% as Asian Americans, 2.6% as Hispanic or Latino, 1.6% as African Americans, and 5.2% as other, mixed race, or did not

respond.Participants ranged in age from 18 to 91 years (M = 53, SD = 15.18). As a result, the majority of participants were over the age of 50, male, and European American.

Control group

We needed a sample of the latter to function as a control group in order to examine the prevalence of each ailment between those with high cognitive ability and those with normal intelligence.Because we were unable to poll a comparable number of people with reliably measured IQ in the average range, we relied on national survey data for each condition. Although national surveys are likely to cover a wide range of intelligence, just 2% of the national data will include those with a gifted cognitive aptitude, such as those who qualify for membership in American Mensa, Ltd. For each illness, data from the most current year was compared to Mensa data from 2015.

3. Materials and Procedure

Members were invited to participate in the current study once Pitzer College and American Mensa, Ltd. obtained IRB approval. Participants were given a link to an online questionnaire. Participants willingly replied to the survey questions after granting consent, which was followed by a debriefing page. The survey had two sections: one for the participant and one for the person's children and the child's other biological parent. This study only used data that was directly relevant to the individuals.Participants first completed demographic questions on their age, gender, educational and career background, and IQ scores within each section. They also answered questions concerning other parameters, such as average stress levels and sleep habits, on a 5-point scale ranging from very unhealthy to very healthy (analysis of factors unrelated to excessive excitability was excluded from this study).

Depressive disorder, dysthymic disorder, and bipolar disorder are examples of mood disorders. Generalised anxiety, social anxiety, and obsessive compulsive disorder are all examples of anxiety disorders. ASD refers to the DSM-IV diagnosis of autism, Asperger's syndrome, and other pervasive developmental disorders. Individuals who suspect they have the illness (self-diagnoses) are included in the "combined" group, as are those who have been diagnosed by a medical expert. The confidence intervals are for the percentage of diagnosed people with high IQ (as well as those with multiple diagnoses). The risk ratio compares the risk of developing each disorder for persons with high intellect to the national averages.

Table 1
Prevalence and risk ratios in high intelligence sample compared to the national average.

Conditions	National average		High intelligence		Confidence intervals		*p* value	Risk ratio
	Percent	Frequency	Percent	Frequency	Lower	Upper		
Mood disorders								
Diagnosed	9.5%	352	26.8%	995	0.25	0.28	< 0.001	2.82
Combined			36.6%	1361	0.35	0.38	< 0.001	3.85
Anxiety disorders								
Diagnosed	10.9%	405	20.0%	743	0.19	0.21	< 0.001	1.83
Combined			37.3%	1387	0.36	0.39	< 0.001	3.42
ADHD/ADD								
Diagnosed	4.1%	152	7.4%	275	0.07	0.08	< 0.001	1.80
Combined			13.9%	517	0.13	0.15	< 0.001	3.39
ASD								
Diagnosed	1.0%	037	1.2%	44	0.01	0.02	< 0.001	1.20
Combined			6.3%	235	0.06	0.07	< 0.001	6.30
Food allergies								
Diagnosed	3.7%	137	9.6%	357	0.09	0.11	< 0.001	2.59
Combined			15.0%	556	0.14	0.16	< 0.001	4.05
Environmental allergies								
Diagnosed	10.6%	394	33.2%	1232	0.32	0.35	< 0.001	3.13
Combined			45.9%	1706	0.44	0.48	< 0.001	4.33
Asthma								
Diagnosed	7.4%	275	15.4%	573	0.14	0.17	< 0.001	2.08
Combined			17.3%	641	0.16	0.19	< 0.001	2.34
Autoimmune disease								
Diagnosed	8.0%	297	14.7%	546	0.14	0.16	< 0.001	1.84
Combined			16.0%	594	0.15	0.17	< 0.001	2.00

4. Results

This study compares the prevalence of several illnesses in people with higher intelligence to people with average ability. We used a series of binomial tests to compare observed proportions in the study sample (those with high intellect) to hypothesised values (national averages) for this research. ADHD has a prevalence rate of 4.1%. We would predict 152 people to be diagnosed with this disease based on the total sample size of 3715. However, the actual frequency of ADHD diagnoses among the participants in this study was 239 (7.4%), which is significantly higher (exact binomial p 0.001).Table 1 compares the proportion of high intellect individuals to national averages across all situations. The significance of this test suggests that a larger proportion of individuals with high intelligence have the specified disorder than would be expected based on national averages, implying that high cognitive ability may be a risk factor for the specified disorder.The increasing number of tests done increases the likelihood of making at least one Type I error. As a result, we employed Bonferroni's adjustment (= 0.05/16), yielding a corrected =0.0031. Table 1 shows that the prevalence of all eight disorders was considerably higher in the high intelligence sample than in the national averages. These findings were consistent for both diagnosed diseases and combinations of diagnosed and suspected conditions. Because none of the interval ranges include zero, the 95% confidence intervals (CI) give additional support for these significant findings. Furthermore, the CI ranges are also narrow, indicating minimal mistake rates. As indicated in Table 1, the CI ranges are greater than 3%, indicating that the reported prevalence for people with high intelligence in each category is within 1.5% of the true prevalence.However, sample size

has an effect on significance and confidence intervals, and the huge sample size in this study makes finding significance unsurprising, even after accounting for the number of calculations. As a result, investigating effect magnitude is particularly beneficial. We provided the relative risk, or risk ratio (RR), for effect sizes, which reflects the likelihood of being diagnosed with the specified condition for an individual with high cognitive ability (seen) compared to an individual with average intelligence (hypothesised).

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