Prosopagnosia And Asperger's Syndrome: A Review Analysis

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Abstract - Prosopagnosia, also known as 'Visual Agnosia', is a neurological condition which is indicative of difficulty in recognising similar faces. On the other hand, Asperger's Syndrome is a neurobiological disorder which lies at the higher-functioning continuum of the autism spectrum. There have been some speculations about their correlation but nothing significant and concrete has been indicated so far. A critical review of both the disorders is required to draw conclusive results and further study their relationship at a deeper level. The aim of this research is to conduct a critical review of literature in this area and to find out if there exists a relationship between Prosopagnosia and Asperger's Syndrome. The review unveils significant conclusion and hypothesis for further research. This review suggests further research in this field which will be helpful in gaining a deeper clarity about the exact nature of relationship between Visual Agnosia and Asperger's Syndrome.

Keywords: Prosopagnosia, Asperger's Syndrome, Autism Spectrum Disorder.

I. INTRODUCTION

The brain is an exceptionally perplexing and secretive bit of biological gear and keeping in mind that we are bit by bit gaining knowledge increasingly about it, there is still much more that we don't get. Now and then the complex and apparently nonsensical nature of the brain is enlightened in examples of brain damage, where we can witness directly what happens when something turns out badly with its standard working. The outcomes can be so impossible to miss, thus exact, that it appears to be inconceivable that they may be the aftereffect of a solitary injury.

Prosopagnosia is a condition that could be contended to fall into this class. This is a disorder of face perception which brings about the disabled capacity to perceive faces. What makes it so exceptional is that the capacity to perceive different items can be left totally in place – and the patient may even have the capacity to perceive looks and different highlights but not distinguish when they are seeing a face, nor whose face it is that they are seeing.

There are two types of prosopagnosia:

Apperceptive Prosopagnosia: This condition is believed to be a disorder of the prior procedures in facial recognition. This issue makes it inconceivable for the patient to understand faces, to make same-distinctive judgments notwithstanding when contrasting faces next with each other, or to make judgments, for example, sexual orientation or age.

Associative Prosopagnosia:

This is believed to be a weakness in the connection between early face recognition forms and the semantic data we have about individuals. At the end of the day, the individual can tell the sexual orientation and age of an individual, and they can recognize contrasts between faces. However the individual is not ready to put a name to a face, or to perceive a similar face after observing it once more. This recommends they can distinguish the face on an oblivious level, however that they are not deliberately mindful of this data.

Prosopagnosia Causes

The causes for prosopagnosia are not completely seen, in any case it appears that the condition is related with harm to the fusiform gyrus – part of the temporal lobe required for the handling of different visual and lexical recollections (capacities incorporate face and body acknowledgment, word acknowledgment, number acknowledgment, etc).

The term prosopagnosia was originally created to allude to instances of brain trauma that brought about lost capacity to distinguish faces. Notwithstanding it has later become visible that prosopagnosia may likewise be an inborn condition called 'developmental prosopagnosia' which is by all accounts the consequence of a specific quality and which influences around 2.5% of the populace. Since facial memory assumes a critical part all in all memory and in ordinary social conduct, the condition can make it troublesome for people to mingle ordinarily and to monitor data with respect to other individuals.

Prosopagnosia Treatment

There is as of now no cure for prosopagnosia and there are couple of fruitful therapies. In any case it is conceivable to manage prosopagnosia using an assortment of strategies which by and large include the utilization of different prompts with a specific end goal to perceive individuals – signs, for example, attire, haircut, stature, notice, weight

and in milder instances of the condition sexual orientation, ethnicity and weight. Numerous exceedingly successful and celebrated people have figured out how to live with prosopagnosia without it affecting their levels of accomplishment, including Oliver Sacks, author of "The Man Who Mistook His Wife For A Hat" – who in spite of studying the condition, didn't know that he suffered with it.

Prosopagnosia in Children

Developmental prosopagnosia can be a troublesome thing for a child to both comprehend and adapt to. Numerous grown-ups with developmental prosopagnosia report that for quite a while they had no clue that they had a shortfall in face processing, uninformed that others could recognize individuals exclusively on facial contrasts. Prosopagnosia in youngsters might be neglected; they may simply have all the earmarks of being exceptionally bashful or somewhat odd because of their failure to perceive faces. They may likewise experience serious difficulties making companions, as they may not perceive their schoolmates. They regularly make friends with kids who have clear, recognizing highlights.

Youngsters with prosopagnosia may likewise experience issues following the plots of network shows and motion pictures, as they experience difficulty perceiving the diverse characters. They have a tendency to float towards kid's shows, where the characters dependably wear a similar thing and have other effortlessly perceived recognizing highlights. Prosopagnosiac kids may likewise experience serious difficulties distinguishing relatives one from the other, or perceiving individuals outside of any relevant connection to the subject at hand.

Furthermore, youngsters with prosopagnosia can have a troublesome time at school, because a lot of school experts are not knowledgeable in prosopagnosia.

Symptoms

Everybody, here and there, experiences difficulty perceiving appearances, and it is much more typical for individuals to experience difficulty recollecting other individuals' names. Prosopagnosia is substantially more serious than these regular issues that everybody encounters. Prosopagnosics, regularly, experience issues perceiving individuals that they have experienced commonly. In more extreme cases, prosopagnosics experience difficulty perceiving even those individuals that they invest the most energy with, for example, their life partners and kids.

One of the indications of prosopagnosia is a great dependence on non-facial data, for example, hair, stride, dress, voice and other data. Prosopagnosicslikewise some of the time experience issues envisioning the facial appearance of associates.

Asperger's Syndrome

Asperger syndrome (AS) is a developmental disorder characterized by critical challenges in social interaction and nonverbal correspondence, alongside limited and stereotypical behaviour and interests. It is an autism spectrum disorder (ASD) and varies from different disorders by moderatelynormal language and intelligence. Although not required for finding, physical awkwardness and surprising utilization of dialect are normal. Manifestations normally start before two years of age and can keep going for a man's whole life.

The correct reason for Asperger's is unknown. While there is likely a genetic basis it has not been confirmed. Environmental factors are likewise accepted to play a role. Brain imaging have not recognized a common underlying problem. The finding of Asperger's was disposed of in the 2013 fifth version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and individuals with these side effects are currently included inside the extreme introvertedness range issue along with autism and pervasive formative issue not generally specified. It stays inside the tenth release of the International Classification of Diseases (ICD-10) starting at 2015.

There is no single treatment, and the viability of specific interventions is upheld by just constrained data. Treatment is gone for enhancing poor relational abilities, over the top or monotonous schedules, and physical clumsiness. Efforts may incorporate social aptitudes training, cognitive behavioral therapy, physical therapy, speech treatment, child rearing preparing, and medicines for related issues, for example, depression or anxiety. Most kids enhance as they grow up, however social and communication challenges may persist. Some analysts and individuals on the autism spectrum have pushed a shift in attitudes toward the view that extreme introvertedness range issue is a distinction, instead of a sickness that must be dealt with or cured.

The disorder is named after the Austrian pediatrician Hans Asperger, who, in 1944, portrayed youngsters in his training who lacked nonverbal communication, had limited understanding of others' emotions, and were physically clumsy. The present day origination of Asperger's Syndrome appeared in 1981 and experienced a time of promotion.

II. PREVIOUS WORK

Justine Sergent and Jean-Louis Signoret (1992) investigated prosopagnosia in three patients in an endeavor to recognize the basic and utilitarian levels at which the processing of faces separates, the connection amongst prosopagnosia and related deficiencies, and the specificity

of the prosopagnosic aggravation. Each of the three patients showed perceptual disabilities of unequal seriousness. In one patient, the shortfall incorporated every single perceptual operation on faces, including coordinating indistinguishable perspectives of similar appearances, however it didn't reach out to all classes of objects described by a nearby likeness among their cases; the second patient showed a less extreme perceptual weakness yet was not able to get the configurational properties from a facial portrayal and to remove its physiognomic invariants; the third patient had not lost the ability to separate faces on the premise of their setups yet couldn't connect a facial portrayal with its relevant recollections. Related shortages were available in every patient except contrasted relying upon the anatomo-practical locus of the separate, albeit all patients were weakened at perceiving non-authoritative perspectives of items that they promptly perceived when appeared from a regular perspective. In any case, execution separation inside patients and twofold separation between patients propose that these related shortfalls are a bit much concomitants of prosopagnosia. Ilse Kracke (1994) presented a case of a young man who appeared to be normal and intelligent but a little immature. During further psychological assessment, it was found that he was suffering from Profound Prosopagnosia; as well as autistic features of the Asperger type were found in milder form. The author suggested that prosopagnosia might be an essential symptom in Asperger's Syndrome. Martha J. Farah and Kevin D., et al. (1994)found that a prosopagnosic subject incomprehensibly performed better at coordinating reversed faces over upright faces, the inverse of the typical "face inversion effect". The way that his hindrance was most articulated with the jolts for which ordinary subjects demonstrate the best capability in face perception gives proof of a neurologically restricted module for upright face acknowledgment in people. An extra ramification of these data is that specific frameworks may control conduct notwithstanding when they are failing and along these lines maladaptive, steady with the compulsory operation of such frameworks as indicated by the "modularity" theory of the psychological design. I Jambaque and L Mottron, et al. (1998) studied the symptoms of Autism and Prosopagnosia in a 13-year old girl, who had a right temporo-occipital cortical dysplasia which was removed, surgically when she was 7 years old. It was found that even though prosopagnosia and autism are dissociable factors, the finding of the two shortfalls underpins the likelihood that occipito-temporal lesions can incline to the advancement of autism. Christine Deruelle and Cecilie Rondan et al. (2004) conducted two experiments for autistic children to check the possible abnormal face processing strategies. After the first experiment, where the children had to recognize faces on certain aspects, all aspects, except for identity matching, showed a deficit in the autistic children, when compared with the control group. Along with that, in the second study, where children had to match faces on either high or low spatial frequency information, as compared to control subjects, the autistic children showed better performance confirming certain face-processing peculiarities in this populace. Jason J.S. Barton and Mariya V. Cherkasova, et al. (2004) studied the ability to recognize famous faces in 24 adults with a variety of SDD diagnoses. They concluded that the anomalous face acknowledgment in some SDD subjects is identified with hindered view of facial structure in a way suggestive of occipito-temporal dysfunction. Ruth Brunsdon and Max Coltheart et al. (2004) reported a treatment contextual investigation concentrated on face perception impairments intended for AL, an 8-year-old child with prosopagnosia. AL's prosopagnosia was described by deficiencies at the level of auxiliary encoding—that is, he was not able to accomplish ordinary fundamental view of appearances. This hindrance at that point affected on every resulting part of natural and new face processing. Nitty gritty evaluation of highlight handling uncovered disabilities in view of facial highlights with a separation between moderately great impression of the mouth highlight and poor impression of eye and nose highlights. Curiously, results additionally recommended in any event halfway inner portrayal of facial highlights in spite of long-standing shortages in impression of these highlights. A treatment program concentrated on preparing in recognition, and examination of facial highlights and well-known face naming was led. Treatment brought about incredible face naming for natural faces, a diminished dependence on non-facial signals and a lessening in AL's propensity to misidentify new faces as relatives. Martina Grueter and Thomas Grueter, et al. (2007)presented 38 cases with suspected hereditary prosopagnosia which was detected by using a screening questionnaire. They found imperative evidence for powerful hereditary contribution to facial recognition skills.Christian Dobel and Jens Bolte, et al. (2007) compared six cases of congenital prosopagnosia to unimpaired members utilizing standardized test batteries, customized test ideal models, and clinical surveys. Each prosopagnosic member showed shortages in perceiving well known faces and holding novel faces over brief timeframes. Different parts of face observation, for example, judgment of passionate appearance, discourse perusing and memory for countenances and names were debilitated to a lesser degree or just in single cases. No confirmation was found for general visual shortages or social dysfunctions. Two of their six cases were first request relatives, and a further three report first-order relatives experiencing prosopagnosic manifestations. The outcomes are in accordance with the possibility of a hereditary segment to congenital or inborn prosopagnosia.TirtaSusilo and Bradley Duchaine (2013) defined developmental

prosopagnosia (DP) as face recognition shortfalls without brain damage. They found that DP influences ∼2% of the populace, and it frequently keeps running in families. DP studies have gained impressive ground in recognizing the intellectual and neural attributes of the disorder.

III. CONCLUSION

Not much work has been done when it comes to studying Prosopagnosia and Asperger's Syndrome, together. But the minimal amount of researches that were conducted suggest that there exists a positive relationship between the two variables. It was seen in, for example, Ilse Kracke's study where it was mentioned that Prosopagnosia may be an essential symptom in Asperger's Syndrome.

In another research, conducted by Christine Deruelle and CecilieRondan, et al., it was mentioned that certain face-processing difficulties persisted in the autistic population. After a careful review of a lot of researches, documents and books, it was found that Prosopagnosia can be either congenital or a result of damage to the Fusiform Gyrus.

A research was conducted by a Stanford's neurologist, Josef Parvizi, along with a neuroscientist, from the same university, Kalanit Grill-Spector, on a patient, Ron Blackwell.

Blackwell used to suffer from Epilepsy and had sought treatment at Stanford, under Josef Parvizi. After going through an experimental treatment method, Parvizi suggested to run a full-blown experiment on Blackwell's brain. After going through proper examinations, Parvizi and Grill-Spector arrived at the conclusion that Fusiform Gyrus played the main role in facial recognition.

Coming to the relationship of Prosopagnosia with Asperger's Syndrome, it can be hypothesised that Prosopagnosia in an individual with Asperger's Syndrome can lead to the explanation of the presence of lack of empathy in individuals suffering from Asperger's Syndrome. If the individual won't be able to look at or identify someone's face, there is a high chance that he/she will not be able to identify the other person's expressions, or the feelings that they want to convey, through their facial expressions.

IV. FUTURE SCOPES

It is suggested that more researches be done in this field, in order to obtain more clarity on this aspect.

It is also suggested that every person suffering from Asperger's Syndrome must be checked for facial-recognition difficulties.

More research needs to be done in order to identify if, in reality, the explanation for the lack of empathy in individuals with Asperger's Syndrome, is the presence of Prosopagnosia, or not.

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