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Comparison of High-Functioning Autism and Asperger Syndrome

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Definition

Since Hans Asperger's first description, through Lorna Wing's translation and definition, to its introduction in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), Asperger syndrome has always aroused huge interest and debate, until vanishing in the DSM fifth edition (DSM-5).

The following entry will describe the history of Asperger syndrome, from the original description to the current diagnostic classifications, focusing on clinical profile, boundaries with high-functioning autism and nosographic implications.

Historical Background

In the same years of Leo Kanner's description of infantile autism (Kanner 1943), Hans Asperger wrote a case report on autistic psychopathy (Asperger 1944), describing children with social-communication impairment, eccentric manners, unusual interests, and cognitive domains of hyperfunctioning. The American Psychiatric Association (APA) did not immediately recognize Autism as a distinct category: it was introduced as infantile autism in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) and included within pervasive developmental disorders (PDD) in the DSM-III-R. In 1981, Wing resumed Asperger's researches, renaming the autistic psychopathy as Asperger syndrome (AS) (Wing 1981). In 1989, the first diagnostic criteria for AS were proposed (Gillberg and Gillberg 1989; Szatmari et al. 1989), and in the 1990s, AS appeared in the fourth edition of DSM (DSM-IV) within PDD. The diagnosis of AS required at least two symptoms of social interaction impairment and one symptom of behavioral and interest restriction, a normal cognitive functioning, and the absence of significant general delay in language. Moreover, diagnostic criteria for autistic disorder should not be met (otherwise, autistic diagnosis should have precedence). This implied a differential diagnosis between AS and autism, especially the type without cognitive delay, also known as high-functioning autism (HFA). HFA is not a term used in the DSM, but it is commonly used to identify subjects diagnosed with autistic disorder (AD) or PDD-not other specified (PDD-NOS), with average or above average intellectual abilities (intelligent quotient, IQ, higher than 70). HFA differs from low-functioning autism (IQ lower than 70) in terms of clinical presentation,

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prognosis and need for support and assistance in daily life. Since AS and HFA are both characterized by a normal cognitive functioning, there has been considerable debate over whether AS and HFA are distinct conditions, suggesting different etiological and neurobiological mechanism, or share a similar underlying neuropsychological functioning and should therefore be regarded as variants of a single disorder. According to Hans Asperger original description, his patients differ from those described by Kanner (Asperger 1944). Instead, Lorna Wing, translating Asperger's work, named the syndrome and Kanner's autism both part of an autistic continuum (Wing 1981). AS definition and its boundaries with HFA have been the topic of a growing body of literature, providing contradictory results: some authors considered the available evidences insufficient to establish the validity of AS as a syndrome distinct from HFA; others found quantitative rather qualitative differences between them. Sharma et al., in a review of 69 research studies, published from 1981 to 2010, defined "confuse and inconsistent" AS diagnosis, since it is based on criteria mostly overlapping with autism, from which though it could stand out for some fine differences in the nature of social interaction and communication (Sharma et al. 2012).

The unsolved confusion in defining AS criteria and the clinical overlap between HFA and AS led to its merging into one unifying category, on the assumption that they cannot be reliably differentiated from one another; the DSM-5 incorporated AS into autistic spectrum disorder (ASD), removing the previously discrete diagnostic presentation of PDD. According with members of the DSM-5 Neurodevelopmental Disorders Committee, the application of DSM-5 criteria demonstrated adequate sensitivity across all PDD subcategories, also including subjects denoted as cognitively higher functioning and AS (Huerta et al. 2012).

Current Knowledge

Irrespective of the DSM-5 changes, several studies (also published later than 2013) continue to debate about AS and its conceptualization within ASD (Volkmar and McPartland 2014). Tsai and Ghaziuddin (2014), finding in 95 of 125 comparative studies quantitative and qualitative differences between AS and HFA, expressed their concern about the risk that with the single category of ASD, DSM-5 "moved forward into the past."

A recent study conducted a comparison between 150 children and adolescents with diagnosis of PDD, according to DSM-IV Text Revision (DSM-IV-TR) criteria, with an intelligent quotient average or above, among which 80 AS and 70 HFA (including patients with a diagnosis of autistic disorder or pervasive developmental disorder-not otherwise specified), in term of core clinical features, cognitive functioning, school learning abilities, and comorbidities (de Giambattista et al. 2019). Core clinical features were investigated using the Australian Scale for Asperger's Syndrome (ASAS) (Attwood 2006) and the Michigan Autism Spectrum Questionnaire (MASQ) (Ghaziuddin and Welch 2013). Administering ASAS, social abilities resulted impaired in both groups, even if HFA appeared more compromised above all in avoiding social contact. AS can show more motivation to socialize and desire for friendship, even if this does not translate into superior ability to make friends, because they appeared awkward, eccentric, one-sided, and insensitive. Emotional dysregulation was another common feature in AS and HFA, resulting in need for excessive amount of reassurance and problems especially regard to anger and anxiety management. Among communication abilities, both the conditions presented some deficits in reciprocity of conversation, eye-contact, and modulation of voice tone; nevertheless, over-precise and pedantic speech (characterized by overly formal speech, similar to an in-depth monologue about a topic of special interest, verbose and tangential, lack of the normal prosody, enriched by a sophisticated vocabulary) was significantly more frequent in AS and literal interpretation of comments more common in HFA. The first finding ("over-precise or pedantic speech") is unsurprising and represents one of the most typical clinical feature of AS, firstly described by Hans Asperger's original work (1944, in which AS were called "little professors" for their

way of talking), then included in the following proposed diagnostic criteria sets (Gillberg and Gillberg 1989; Szatmari et al. 1989) and confirmed by subsequent studies (Woodbury-Smith and Volkmar 2009). The second finding ("literal interpretation of comments") may be related to the HFA worse cognitive and comprehension abilities, which made them less able in recognizing the speaker's communicative intention and in social understanding, unlike patients with AS, who adopted intellectual strategies of compensation.

Delay in language development resulted significantly more common in HFA, even if also in AS, a mild language delay was reported. In the DSM-IV-TR, the "absence of clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years)" was a relevant criterion for AS diagnosis. In contrast with this theoretical construct, extensive literature data showed that language delay could not be considered as a diagnostic exclusion criterion for AS because subtle language problems are expected in AS and also because the recognition of a language delay is not always enough reliable, since it is often dependent on parents recall. Clumsiness, that has been originally considered a distinctive feature of AS appeared indifferently present in AS like in HFA, as well as sensory abnormalities (such as unusual fear/distress due to light touch on skin or scalp, and to unexpected noises), restrictive pattern of interests and behaviors, and difficulties in adaptation to changes. The clinical profile of AS is less likely to include motor mannerism and preoccupation with parts of objects (defined "low order repetitive restricted behaviors") while more often presented circumscribed interests that consumes a great deal of their time amassing information and facts (defined "high order repetitive restricted behaviors").

About cognitive functioning, evaluated with Wechsler scales, AS showed Full Scale Intelligence Quotient mean values and sub-values significantly higher than HFA, without differences between verbal and performance subvalues. This overall better performance in AS represented a well-established mark of differentiation between AS and HFA. Indeed, some authors identified a qualitatively distinct cognitive profile (characterized by a higher verbal IQ and a lower performance IQ and a reversed pattern in HFA), while others reported mixed cognitive patterns. The two conditions could likely be distinguished at a quantitative cognitive level, represented by FSIQ, rather than at a qualitative level, represented by specific cognitive profile. Nevertheless, as for intellectual disability, the presence of very different IQs could denote distinct levels of severity and clinical profile, in the same way a large discrepancy between AS and HFA intellectual scores could have a qualitative effect on general function.

Learning disorders resulted significantly more frequent in HFA, with the exception of dysgraphia, that emerged frequently in both groups, according to the original description of Hans Asperger (Asperger 1944), who described in his patients low performances in handwriting, in terms of forming letters and using the paper space. AS may not show any conspicuous learning disturbances, but an inhomogeneous school profile, characterized by talents in some school subjects, such as precocious learning to read, numerical abilities, or memory, while poor application and performances in other school subjects, perceived as less interesting.

The most prevalent comorbidity both in AS and HFA was attention deficit hyperactivity disorder (ADHD). An association between ASD and ADHD and other externalizing disorders have been reported and supported by clinical population research and twin studies, suggesting substantial genetic overlap (Taylor et al. 2015). Considering that comorbidity between these disorders was a relevant and frequent occurrence, differently from the previous edition, DSM-5 allowed the diagnosis of ADHD in the context of an ASD. Subjects with AS displayed more anxiety and depressive symptoms compared to HFA. This could be explained with AS higher cognitive and communicative levels, that made them more able in introspection, more "active but odd" (Ghaziuddin 2008) in relations attempts, more conscious of social difficulties and so more vulnerable to affective disorders.

Overall, among AS and HFA, differences in neurodevelopmental trajectories and subsequent

need for health service could be recognized. Clinical signs in AS might be subtle and camouflaged in preschoolers and could become clear at the age of 7 or 8 years, leading to a later diagnosis.

Another focus of debate is the effect of DSM-5 criteria application on high-functioning ASD. Recent studies indicated a percentage between 50% and 75% of individuals maintaining diagnosis under DSM-5 criteria (Smith et al. 2015). A so wide concordance range could reflect diagnostic methodologies adopted in different studies: the gold standard diagnostic instruments for the assessment of autistic disorder could have low sensitivity when applied to high-functioning subjects. Clinical judgment of qualified professional experts and the use of specific rating scales, designed on the clinical characteristics of HFA and AS, may contribute to reduce the risk of underdiagnosing. According with this perspective, the study of de Giambattista et al. (2019) provided evidences that using brief and simple screening instruments such as ASAS and MASQ, it is more likely to recognize specific features of HFA functioning: indeed, 97.3% of the subjects, previously diagnosed according to DSM-IV-TR, met DSM-5 criteria for ASD and administrating MASQ different scores in HFA and AS were found. Moreover, when DSM-5 specifiers of severity levels were applied to the sample, HFA were more frequently classified in Level 2 ("requiring substantial support") than AS, while AS were more frequently classified in Level 1 ("requiring support").

Future Directions

Considering available evidences, it is likely to assume that a complex aged-related different developmental profile between HFA and AS exists, characterized by quantitative and subtle qualitative differences such as language development and communication style, cognitive functioning, academic achievement, and comorbidities profile.

Consistently with clinical findings, biological patterns of differentiation were found: a recent genome-wide association meta-analysis revealed evidences for a qualitatively different genetic architecture between subtypes of ASD (Grove et al. 2019), differences in neuroimaging field, in particular in gray matter distribution (Bi et al. 2018), and in EEG connectivity patterns (Luckhardt et al. 2014).

While acknowledging the merit of the DSM-5 to have solved lots of previous classification discordances and "splitting" approaches (Volkmar and McPartland 2014), it is necessary to consider the risk that defining autism using the umbrella term ASD, could hide its evident heterogeneity (Lai et al. 2013) and particularly that in the severity specifier "Level 1" of the DSM-5, many phenotypic variances could be squeezed making this level very heterogeneous.

It is likely that recognition of different "nuances" of the spectrum may contribute to tailor research, clinical, and assistential approaches. For example, since language development and academic abilities play a central role in global functioning during the first years of life, HFA require more support in terms of rehabilitative treatments and school educational needs than AS, while in middle childhood and adolescence, AS require more support in terms of psychotherapy, presenting more emotional and mood problems than HFA.

Several expert researchers and specialists in the field have invited to reflect about the consequences of removing AS from the available classification, just when it was better understood by the society: the lack of a "label" in which subjects recognized themselves might cause confusion and damage the identity sense of the yet established "Aspie community" ("Aspie" is an affectionate term often used to describe a person with an AS diagnosis or profile).

Future direction in the field of ASD categorization could move forward in the identification of subtypes within the autism spectrum: "subtype specifier" and "partial remission specifier" could promote progress in autism research and improve clinical practice.

DSM-5 allows to use specifiers of language and intellectual impairment that resulted enough restricted to distinguish clinical profile of

HFA from classical, low functioning, autism. Nevertheless, a "subtype specifier" for AS could be useful to hypothesize putative developmental trajectories and direct specific paths of treatment.

Moreover, recent theories of neurodiversity, accompanied by the preference of the more neutral term of autism spectrum condition (ASC) rather than ASD, consider AS as a natural variation rather than a syndrome. In fact, AS subjects could, in particular conditions ("Aspie-friendly" or in preschool age), temporarily lacked significant global impairment. Their phenotypes may be considered subclinical-AS-forms. Nevertheless, in most cases, these subjects need a sort of support (cognitive-behavioral treatment, parent/teacher psychoeducation, personalization of school program), also for preventive purpose only. As in ADHD coding of DSM-5, regarding level 1 ASD patients, it could be suggested the use of "subclinical" specifier, for those patients who express only subthreshold autistic-traits and "partial remission" specifier, for those patients who do not meet currently the full diagnostic criteria.

In conclusion, even continuing to use the broad category of ASD, it could be meaningful to introduce, in future revisions of the manual, subtype specifiers that could capture the "nuances" of the spectrum.

Future research about the efficacy of these prospective specifiers could be beneficial.

See Also

- Academic Skills
- Atypical Autism
- Depressive Disorder
- DSM-5 and Autism Spectrum Disorder
- High-Functioning Autism (HFA)
- Neurodiversity

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