EDITORIAL

Autism and other disorders of social interaction: where we are and where to go from here

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Since its first description in the 1940s by Leo Kanner and Hans Asperger, autism continues to be a clinical diagnosis made by assessing difficulties in social interaction and communication on the one hand, and restricted interests and repetitive behaviors on the other. The criteria for diagnosing autism today are laid out in the "Diagnostic and Statistical Manual of Mental Disorders" (DSM-5) and the "International Classification of Diseases" (ICD), which in its 11th version now also collapses previously existing subcategories into the single diagnostic category of "autism spectrum disorder" (ASD) consistent with DSM-5. Clinical autism assessments are complemented by well-established tools for the structured observation of autistic behavior and the collection of developmental information about a person's first years of life.

Despite a significant increase in the number of autism diagnoses over the past decades, which have indicated that this life-long neurodevelopmental disorder affects around 1–1.5% of the general population making ASD a relatively common psychiatric disorder, the topic of missed diagnoses and misdiagnoses particularly in the case of autistic adults/ adults with ASD continues to be an important issue. This is pointed out by a study by Fusar-Poli and colleagues [1] who described that the diagnosis of autism is not always made in childhood or adolescence, but that there is evidence for a diagnostic gap of as a long as 11 years between a first evaluation performed in adolescence and a formal diagnosis of autism being made in adulthood. This, the authors argue, could be related to a certain prerogative of child psychiatry with regard to diagnosing a neurodevelopmental disorder

and adult psychiatry having been relatively slow to catch up to the idea of a late diagnosis of autism. Today, a growing number of specialized autism services is also available in adult psychiatry. According to Fusar-Poli et al. [1] and other studies, those, who receive a diagnosis only in adulthood, generally have average or above-average cognitive abilities and need low to medium levels of support. In other words, autism is not (only) a childhood disorder, but one that persists across the life span, and autism is not—as once thought—inevitably associated with severe cognitive and language impairments. Importantly, however, an autism assessment in adults provides important challenges: first of all, it can be difficult or even impossible to gather information from parents or caregivers about early childhood development to ascertain the presence of autism-specific symptoms during that period. Second of all, the presence and history of other psychiatric symptoms often complicates the assessment as those symptoms need to be considered as part of a wide differential diagnosis ranging from affective and anxiety disorders to OCD and personality disorders, all of which are known to affect social interaction abilities, and in terms of psychiatric comorbidities. While the transition to adulthood often sees improvements and a reduction in the severity of autism symptoms, adulthood is also often associated with profound difficulties in different areas of life for autistic persons, which can bring about or exacerbate psychiatric comorbidities. In terms of the latter, it has, indeed, been demonstrated that adults with ASD are at a much higher risk of being diagnosed with depression and anxiety disorders, whose development appears to be linked to autism-related difficulties in everyday life [2]. Importantly, it has also been shown that premature mortality exists in individuals with ASD and could be related to depression-linked suicidality making this a topic of great concern. These findings document the need for follow-up studies from adolescence to adulthood to learn more about trajectories of development and different prospects in order to develop a better model of prognosis and individualized support measures for adults

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with ASD. In addition, the above described findings also highlight the need for an early and ongoing surveillance of psychiatric comorbidities in individuals with ASD to assess symptoms and guide treatment also towards comorbid symptoms.

Apart from autism, attention deficit/hyperactivity disorder (ADHD) constitutes another neurodevelopmental disorder, whose perception in the field has undergone significant change. Originally thought of as a childhood-only disorder, ADHD is now also recognized as a condition that demonstrates persistence into adulthood. In light of this, links and potential overlap between ASD and ADHD have been explored more extensively in recent years. A study by Hayashi et al. [3], for instance, has investigated the presence of ASD symptoms in adults with a formal diagnosis of ADHD by using the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2), an observer-dependent rating scale that is considered as the 'gold standard' of behavioral observation for autism assessments. The findings demonstrate that around 20% of adults with ADHD without childhood ASD symptoms met criteria for ASD based on ADOS-2 scores. Interestingly, there was no correlation between the observer-dependent ADOS measure and self-reported autistic traits in the ADHD patients, while the opposite is often observed in populations, who present to a specialized adult autism clinic. These findings could be taken to suggest symptom overlap between ADHD and ASD and indicate the presence of interactional difficulties in ADHD, also reflected at the level of social functioning found to be lower in the subgroup of ADHD patients with higher ADOS scores. The study also highlights another topic that is of general interest for the clinical and research field of autism, neurodevelopmental disorders and other disorders of social interaction: while ADOS is recognized as a more objective measure of social impairments, it still depends on subjective ratings provided by a trained observer. Recent studies have suggested to develop and use fully observer-independent, quantitative measures of dyadic social behavior that could be included in diagnostic procedures and might help to objectively track social interaction difficulties and behavioral change over time [4].

Concerning the underlying neurocognitive mechanisms of autism, it has been proposed that ASD is associated with an impaired ability to perceive the internal states of one's own body, which gives rise to alexithymia, i.e. difficulties in recognizing emotions from internal bodily sensations. Alexithymia, in turn, might be related to the characteristic social interactive and communicative difficulties of autism. The study by Yang et al. [5] investigates the complex relationship of autistic traits, interoception and alexithymia in healthy controls by means of elaborate network analyses and demonstrates that interoceptive sensibility is negatively associated with impaired social skills and positively associated with

attention-to-detail as measured by self-report questionnaires of autistic traits. Furthermore, findings showed that interoceptive sensibility was inversely correlated with alexithymia. In a clinical population, Albantakis et al. [2] have recently investigated the differential contribution of autistic traits and alexithymia to the presence of depressive and social phobic symptoms. Here, it was found that in adults with ASD alexithymic traits were predictive of depressive symptoms, while autistic traits predicted social phobic symptoms. In patients with social interaction difficulties other than autism, alexithymic and autistic traits were identified as predictors of social phobic symptoms, while no variable predicted depressive symptoms. In neurotypicals, both alexithymic and autistic traits were predictive of depressive and social phobic symptoms. Taken together, these findings highlight the importance of assessing both alexithymic and autistic traits to account for the differential contribution to psychopathology. Autistic traits as predictors of depression were also investigated in a study by Ishizuka et al. [6], which used the 50-item autism quotient (AQ) in depressed outpatients without a history of autism. The results demonstrate that high AQ scores are observed in a high percentage of about 40% of adult individuals with depression. This is consistent with previous findings, which have demonstrated that self-report AQ scores do not significantly predict receipt of an ASD diagnosis [7], but can also be associated with the receipt of other psychiatric diagnoses.

With regard to treatment options, individual psychotherapy is an established means to address autism-specific difficulties, but also psychiatric comorbidities. Recent years have seen the development of group-based forms of psychotherapy for individuals with ASD. Drüsedau et al. [8], for instance, present a structured group intervention with a focus on self-perception and mindfulness for children with ASD. This intervention was developed to address emotion recognition and body perception difficulties in autism and was provided in an outpatient setting. Results demonstrate an improvement of social motivation. Furthermore, the treatment was positively evaluated by both children and parents. Also, a reduction of external behavior was noted. The study, therefore, underlines the usefulness of group-based psychotherapy approaches in autism, which had been documented previously. Apart from the important content of a given group-based psychotherapy, it has also turned out that individuals with autism enjoy being in a group with other autistic persons. Interestingly, anecdotal evidence suggests that social interaction difficulties are less pronounced in an all-autistic group, which suggests that social difficulties may not only be related to an individual's traits and abilities, but also to whether or not one person's traits are more or less similar to those of potential interaction partners, which we have described as 'social interaction mismatch'. In line with this idea, Bolis et al. [9] hypothesized that friendship quality

varies as a function of interpersonal similarity, above and beyond autistic traits per se. Results from a sample of neurotypical dyads demonstrate that the more similar two persons are in autistic traits, the higher is the perceived quality of their friendship, irrespective of friendship duration, age, sex and the (average of) autistic traits in a given dyad. More specifically, higher interpersonal similarity of autistic traits was associated with higher measures of closeness, acceptance and help. These results, therefore, lend support to the idea of an interactive turn in the study of social abilities, which may contribute to future endeavors of addressing social interaction difficulties associated with the autism spectrum. Such a view could also help to recognize the neurodiversity perspective and participatory research approaches by including individuals with autism and their allies in making decisions about research to better translate research results into practice and lead to improved outcomes. Based on the idea, that social interaction difficulties are observed in autism, but also other psychiatric disorders, it makes sense to take a transdiagnostic approach in future studies and validate psychotherapy programs that address social impairments across different diagnostic groups [10]. This novel approach could help to further address the complex interplay between biological, behavioral, psychosocial and cultural processes and their effects onto the 'social brain', which may not respect diagnostic boundaries, and could help to address 'disorders of social interaction' that may constitute an unmet medical need, yet to be adequately addressed by the field of psychiatry.

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