

## COMMENTARY: Disproportionate Referral Rates May Falsely Impact the Ratio of Girls and Women on the Spectrum

The majority of all referrals for behavioural concerns and the diagnostic assessment of Asperger's syndrome are for boys (Attwood, 1999), and "because referral is such a strong predictor of special education eligibility," (Hosp & Reschly, 2004), this disproportionate referral rate may explain why the epidemiological research for Spectrum Disorders indicates that the current ratio of males to females with a diagnosis of Asperger's should be 4:1, while the actual rate is approximately 10:1 (Attwood, 1999). Although many girls with Asperger's syndrome demonstrate similar characteristics as those of boys with Asperger's syndrome, their expressions of the characteristics may manifest in more subtle ways. Girls tend to develop camouflaging or masking abilities, and they appear to be "more motivated to learn and quicker to understand key concepts" and social skills (Attwood, 1999). However, making friends or social interaction can be "an exercise in frustration for [a girl] because no matter how hard she tries to fit in, she just doesn't click with the other kids," (Donvan, 2008). Biological and cognitive features, with underlying perfectionistic characteristics, "premorbid impairment in interpersonal functioning," and poor social awareness skills (Zucker, Losh, Bulik, LaBar, Piven, & Pelphrey, 2007, p. 976), may require the "evolutionary view of cognition in terms of domain-specificity" in which theorists have suggested rather than carving up cognition, "one should instead study cognitive development in terms of a small set of 'core domains of cognition,' motivated by an evolutionary framework," (Baron-Cohen, 2000, p. 14).

When boys demonstrate an "overly masculine or result-oriented" personality, demonstrating the belief that there is only one way to do something, or only "one right way," and not demonstrating an acknowledgement of other options or valid approaches, with a need to be in control at all times and very black or white thinking (Gray, 1990, p. 97), he may be demonstrating stereotypical male behavior or exaggerated stereotypical male behavior (Attwood, 1999). This extreme may be considered "typical behavior" for a person with Asperger's, as the tendency toward "black-or-white reasoning" fits the syndrome's characteristics. However, "thousands of girls who suffer from a recognized medical condition are going untreated and branded as problem children because teachers and health experts are failing to spot their symptoms," (Brown, 2006, p. 1).

Typically, children demonstrating more aggressive behaviors are most likely to be the children who are then referred for a diagnostic assessment (Attwood, 1999), and often girls on the spectrum are considered to be "no problem in class," but

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demonstrate extreme mood swings, tantrums, or oppositional behaviors in the home, leading to potential misdiagnosis (Brown, 2006, p. 2). Clinicians should consider all aspects of personality in diagnosing a person with Asperger's syndrome, or failing to diagnose, including how he or she may cope with difficulties in social reasoning and empathy (Attwood, 1999), as well as cognitive rigidity and sensory processing. Disorders affecting social development, like Asperger's syndrome, may often be overlooked in girls and many may be falling "through the cracks of society," (Brown, 2006, p. 1). Including an empathizing model of diagnostic evaluation, as a more comprehensive approach towards evaluation, which encompasses perception, interpretation, as well as the affective response (Knickmeyer, Baron-Cohen, Raggatt, Taylor, & Hackett, 2005), might bring a better understanding and more appropriate measure of Asperger's syndrome in girls and women.

The unfolding of two laws, the physiochemical basis of life and the evolution by natural selection of all known forms of life, defines modern biology. How much, then, of the real living world has biology learned? When the three dimensions—hierarchy, diversity, and history—are taken into full account, it has to be admitted that only an infinitesimal part is known. (Wilson, 2006, p. 115)

Every living species possesses certain unique characteristics and genetic traits, which are unique, fitting a precise need (Wilson, 2006, p. 5); however, people with Asperger's syndrome tend to elicit a strong maternal or predatory reaction from others, e.g., supported and protected versus being bullied or teased (Attwood, 1999). Researchers have "paid little attention to gender differences in developmental disabilities aside from the purpose of establishing prevalence," (Thompson, Caruso, & Ellerbeck, 2003). Parents or professionals may be reluctant to pursue or provide a diagnosis when a girl appears to be maintaining or coping with the characteristics reasonably well and clinicians may hesitate to provide a diagnosis if the characteristics manifested by girls are not different at a conspicuous level, compared to peers (Attwood, 1999). Boys on the spectrum, whether a neurotypical or autistic boy, are generally most keenly aware of innate abilities as well as inabilities, but tend not to give thought as to why they or others may feel the way they do (Wilson, 2006,

p. 67), or how their own actions may affect others. Whereas, in the female brain, the prefrontal cortex is the "queen that rules the emotions and keeps them from going wild. It puts the brakes on the amygdala," and the hippocampus is "the elephant that never forgets a fight, a romantic encounter, or tender moment—and won't let you forget it," (Brizendine, 2006, p. xiii). Whereas a boy with Asperger's may be more inclined to act out, a female with Asperger's may be more inclined to act inward, leading to anxiety, depression, self-abuse, or risk of abusive relationships. This emotional gap as well as the "empathy gap" described in the book *The Essential Difference: The Truth About the Male and Female Brain*, by researcher Baron-Cohen, could provide the key to understanding autism in females as well as males (Cohen, 2004, p. 1).

Empathy can be defined in numerous ways, and non-verbal communication (e.g., posture, gestures, eye contact, facial expression, tone), are clues in revealing our emotions, attitude, personality, and relationships. This helps guide the interpretation of how another feels leading to an empathetic awareness or understanding of others (Helland, 2007, p. 3). This empathetic understanding can be hindered in a person with Asperger's syndrome, particularly women. Given that characteristics of Asperger's may include a complete lack of the sense of fear or danger, too little or too much eye contact, which can appear as overly aggressive, threatening, or seductive, combined with a hindrance in the ability to judge another person's feelings or intentions accurately, girls and women with Asperger's syndrome may be at increased threat for assault, abuse, violence, or worse.

In our brains, neurons are the transmitters for perception, thoughts, feelings, and emotions. Research has demonstrated "massive neurological effects" hormones can have on females during the different stages of life and maturation (Brizendine, 2006, p. 3). Females are considered to be superior in empathy skills and males are traditionally found to be superior systemizers. If a woman with autism is better at systemizing, with extreme attention to detail, and less compelled to demonstrate typically "female characteristics" in relationships (e.g., valuing altruistic, reciprocal relationships, cooperative engagement, strong friendship bonds, nurturing, and smoothing or resisting conflict); but

rather favors task specific activities, aggression, solitary activities, or other “male characteristic” behaviors, (Baron-Cohen, 2002, p. 2), she may become ostracized, envied, or socially isolated. This emotional “maleness” may lead to relational conflicts and a lack of intimate relationships.

Typical females are supposed to be conflict or dispute diffusers focused on emotion and communication, the result of hormonal effects on the brain that compel them towards connectedness and deep friendships, with a “nearly psychic capacity to read faces and tone of voice for emotions and states of mind” (Brizendine, 2006, p. 8). If hormones truly truly have the significant biological and behavioural impact, and exposure to atypical levels of fetal testosterone hormones can correlate with higher levels of masculine behavior and ability patterns (Knickmeyer, Baron-Cohen, Raggatt, Taylor, & Hackett, 2005, p. 1), in theory, the interaction of increased fetal testosterone and subsequent decreased estrogen levels may help to explain autism in girls and women.

Little girls are typically expected to play with other little girls, interact peacefully in a give and take manner, enjoy dolls, and look for a parent’s approval when trying new tasks. Mirroring and eye contact is important in their interactions; however, research indicates that fetal testosterone in the extreme, affects mechanisms underlying social development and can cause significant defects such as congenital adrenal hyperplasia (CAH), a genetic defect in which females show significant masculinization (Lutchmaya, Baron-Cohen, & Raggatt, 2002, p. 327). Baby girls are supposedly born with the need for mutual gazing, as the key in developing the mother-infant bond, however, the lack of eye contact or extreme eye contact characteristic in baby girls with autism is often misunderstood. Babies, who gaze openly, almost unblinkingly, without mirroring expression, are observing, not bonding. However, because baby girls are “pre-wired” to imitate, encode, and decode non-verbal cues better than baby boys (Helland, 2007, p. 12-13), girls with Asperger’s syndrome soon learn to imitate, emulate, and mimic the “appropriate” way to interact with others. Girls with Asperger’s syndrome may blend in better, however their masking abilities only extends to “looking normal” not “feeling normal,” and the communication and unwritten social rules may still threaten her emotionally. Baby girls

are not supposed to experience the testosterone surge in utero, which “shrinks the centers for communication, observation, and processing of emotion, so their potential to develop skills in these areas are” supposed to be better at birth than boys, (Brizendine, 2006, p. 15).

We have evolved, biologically, into various traits and personalities over many thousands of generations (Wilson, 2006, p. 9). Who then, is to say, what is normal or even neuro-typical? Studies of sex difference regarding presentation and incidences in developmental disabilities and related mental health disorders “may contribute to our understanding of the neural circuitry and neurochemistry of both the normal and abnormal brain,” and potentially help to design sex-specific assessment, identification, and interventions (Thompson, Caruso, & Ellerbeck, 2003), leading to better outcomes for girls on the spectrum. “The real, people-permeated world has been transformed into a kaleidoscope of extremes and intermediates, grading from still primal, million-year-old habitats all the way down to parking lots,” with the shift towards, “the humanized, the simplified, the unstable,” (Wilson, 2006, p. 25). In order to reach all students on the spectrum, school psychologists, mental health professionals, physicians, and parents should work together to become better informed regarding research, assessment tools, and diagnostic criteria, as well as the best proactive interventions to increase social skills, personal communication, behavior, and peer interaction for students. Autism is lifelong, and there is no quick fix or cure. However, early diagnosis and effective treatments can provide for better outcomes for girls on the spectrum. The more people are able to expand learning and research to include and appreciate the vast diversity of individual personalities and characteristics, the more likely society is to place value on uniqueness and individuality (Wilson, 2006, p. 63). For a comprehensive review of Asperger’s syndrome, see Attwood (2008).

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