

Comment by Thomas Armstrong

The healing balm of nature: Understanding and supporting the naturalist intelligence in individuals diagnosed with ASD, Comment on "Implications of the idea of neurodiversity for understanding the origins of developmental disorders," by Nobuo Masataka - In *Physics of Life Reviews*, March, 2017, Vol. 20, pp. 109-111.

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Masataka's [1] review article challenges the deficiency-oriented paradigm that most researchers and practitioners in the field of developmental disorders embrace with regard to children and adults diagnosed with autism spectrum disorders (ASD). While acknowledging the clear disadvantages possessed by those with ASD in the social domain, the paper challenges us to consider the possibility that people with this "disorder" may also possess significant strengths and that knowledge of those strengths may help parents, teachers, therapists, and researchers design interventions that are better suited to assisting neurodiverse individuals in successfully adapting to the world.

Many of the abilities the paper focuses on coalesce around the "non-social" perceptual capacities of children and adults identified with ASD. According to Masataka [1], individuals diagnosed with ASD "exhibit enhanced discrimination between auditory stimuli, more accurate local target detection of auditory stimuli, and diminished global interference with auditory processing. In the visual domain, they exhibit enhanced visual discrimination capabilities, faster target detection in feature and conjunctive visual searches, and more accurate local target detection." As he points out, these abilities are highly adaptive for living in nature and would seem to have conferred an evolutionary advantage upon individuals during prehistoric times. I suggest that some of these advantages might have included: quickly identifying and accurately assessing the dangers of predators, identifying and differentiating edible from nonedible or poisonous plants, identifying cloud details that might predict dangerous weather, perceiving potentially treacherous landscape terrain, and facility in tracking animals. Individuals with ASD who show these capacities in today's world might be said to possess what Howard Gardner, as part of his theory of multiple intelligences [2], has termed the "naturalist intelligence." According to Gardner, "[a] naturalist demonstrates expertise in the recognition and classification of the numerous species - flora and fauna - of his or her environment. . . . the naturalist is comfortable in the world of organisms and may well possess the talent for caring for, taming, or interacting subtly with various living creatures"[3].

Researchers and practitioners may wonder what relevance these gifts have in a 21st century world that places a premium upon social cognition and verbal communication (capacities that are part of what Gardner calls "interpersonal" and "linguistic" intelligences). Part of the answer, I believe, comes from new technologies that are offering individuals with high-functioning autism ways of adapting and even thriving in the workplace using skills that may have been originally derived from natural sources. Gardner [3] points out that "even apparent remote capacities – such as recognizing automobiles from the sounds of their engines . . . may exploit mechanisms that originally evolved because of their efficacy in distinguishing between, say, toxic and nontoxic ivies, snakes, or berries." In the same way, the computer industry has been actively recruiting many high-functioning individuals with ASD because of their superior ability in finding tiny errors in computer code or writing precise technical instructions for computer manuals [4], and there may be parallels of such ASD ability/career matches in other occupations as well (5).

However, another more important implication involves the manner in which practitioners might use knowledge about these naturalist gifts to improve the quality of life for individuals diagnosed with ASD. Perhaps the most telling quotation in Masataka's paper is from a thirteen-year-old boy diagnosed with ASD who says: "However often we're ignored and pushed away by other people, nature will always give us a good big hug, here inside our hearts." This statement is significant because it highlights the need of people with ASD for both social support and the healing balm of nature. From an evolutionary perspective, I speculate that there perhaps was a *quid pro quo* in prehistoric societies where individuals with ASD would have provided certain naturalist benefits to the tribe (As autism activist Temple Grandin once famously said: 'Who do you think invented the first stone spear? . . . It wasn't the people chit-chatting around the fire. It was the Asperger's.' [6]) in return for protection from the social aggressions, deceptions, treachery, and other interpersonal dangers of tribal life. Such an exchange might then have ensured the survival of their genes into future generations.

This type of perspective suggests that instead of attempting to find a "cure" for people diagnosed with ASD, emphasis should be placed on honoring their neurodiverse abilities and finding ways of creating environments where their strengths can be maximized and their weaknesses minimized. Recently, the advocacy group Autism Speaks changed its own public relations campaign objectives from finding a cure for autism to "promoting solutions, across the spectrum and throughout the lifespan, for the needs of individuals with autism and their families through advocacy and support; increasing understanding and acceptance of autism spectrum disorder; and advancing research into causes and better interventions for autism spectrum disorder and related conditions" [7]. I've suggested the term "positive niche construction" [8] to characterize the creation of such supportive environments, borrowing the idea of "niche construction" [9] from evolutionary biology, referring to activities that animals engage in which improve their chances for survival (e.g. birds creating nests, beavers building dams, bees making hives).

As Masataka points out, there are a wide range of strategies involving positive niche construction that can engage the naturalist proclivities of individuals with ASD, including pet therapy, learning activities that take place out in nature, and a focus on the color green in both academic and non-academic settings. It's important to point out that these activities can serve both to give people with ASD the opportunity to thrive in green environments as well as the chance to gain important social skills. Berry et al, [10] for example, cites "the ability of dogs to act as social catalysts, enhancing social interaction between people and increasing social networks, especially for those who have severe disabilities and who very often suffer social discrimination." Chang and Chang [11] point out that while children with autism rarely have their therapy conducted outdoors, outdoor activities could provide several benefits including promoting communication, emotion, cognition, interaction, physical activity, and decreasing autistic sensitivity.

Clearly the evidence points toward taking a new look at the positive attributes of individuals diagnosed with ASD with a particular focus on their naturalist intelligence (Masataka also highlights in his paper their ability to visualize, a capacity Gardner calls "spatial intelligence," and a topic deserving of special attention in its own right). Researchers should develop better ways of assessing "nature smart" in the laboratory (perhaps by moving the lab outdoors!), and practitioners need to place a higher priority on providing positive niches in outdoor settings where people with ASD can both work on areas of challenge and also bloom in their own way.

References

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