Overly Regulated Thinking and Autism Revisited
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PROBLEM: Humans exist within a socially mediated dynamical system. Frequent demands are experienced to respond to change in the environment to adapt and flourish. People with autism have impaired behavioral and thinking flexibility and experience high levels of anxiety, as change and adaptation do not come naturally. The disability inherent in autism is by definition the impaired social and occupational functioning that results from lack of adaptation. The point of the behavioral triad of restricted and repetitive interests, activities, and behaviors has received relatively little attention as compared to the other two points of the triad.

METHODS: A review of the literature related to restricted and repetitive interests and activities and behaviors and autism was conducted to inform this theoretical review.

FINDINGS: This paper considers the overly regulated thought and behavior inherent in autism spectrum disorders through the lens of dynamical systems, and an explanatory model is generated.

CONCLUSION: The mathematical tools applied to understand dynamical systems may be a fruitful basis of further research to enable the movement from a theoretical concept of overly regulated thinking and behavior in autism to an empirically derived understanding.

People with autism spectrum disorder (ASD) have a strong tendency to overly stable patterns of thought and behavior. This is not a new understanding, as restricted and repetitive interests, activities, and behaviors have been recognized as part of the behavioral triad of impairment and a basic element of diagnosis. The noisy neural environment does not easily disrupt the locked-in thought and behavioral patterns characteristic of ASD. What is new thinking is the recognition that disruption is a part of healthy neurotypical behavior, as new thought and behavior is generated to allow accommodation to the noisy demands, or adaptation, and this response is dampened or impaired in people with ASD. People with ASD appear to move in a much more fixed direction where noise promotes rigidity and efforts (thoughts and rituals) to filter out the noise, moving the person away from the necessary novel behavior, or thought, demanded to adapt to the environment.

The Typically Noisy Neural Involvement

The neural environment is typically noisy. In the saturated self, Kenneth Gergen (2000) theorized that the noise is steadily increasing in our world in response to connectivity and an increasing array of socially mediated demands. To survive in this environment, it was perceived that one needs to be nimble, as improvisation becomes the way of life. While this thinking seems to have a correspondence to reality, Gergen did falter a little when he discussed the affective response of people to the demands imposed by the self becoming saturated. It is stated that, “any adult who did not have the capacity to feel sadness, fear or love, for example, would be considered psychopathic or autistic” (Gergen, 2000). People with ASD do have affective responses to the noisy environment, it is just that the responses are not labeled and hence easily recognized by the individual (Cashin, 2005, 2008; Cashin & Barker, 2009; Cashin, Browne, Bradbury, & Mulder, 2013). Not labeling affective states can be a barrier to mainstream mental health services that rely on self-identification of states such as feeling anxious or depressed. Autism challenges traditional philosophical thinking around the homogeneity of thinking and information processing. Heidegger (1971) described linguistic processing as a defining trait of humans. Heidegger in his seminal thinking, and later other authors such as Gergen (2000), had not appreciated that there are two styles of thinking and information processing in the world (of course with variance of preference within each style), these
being people with ASD (in the minority) and neurotypical thinkers. Both styles are human but differ in important ways.

The information-processing and thought style inherent in ASD differs in important ways from neurotypical thinking. The thinking and information-processing style inherent in ASD is characterized by the triad of impaired abstraction, linguistic processing, and theory of mind (Cashin & Barker, 2009). Abstraction and linguistic processing are central to the neurotypical strength of concept formation and the ability to generalize. The basic elements of abstraction and linguistic processing in neurotypical thinking results in the formation of a unified base of knowledge about the world, or an “in head” filing cabinet of behaviors to apply in a large variety of contexts (Cashin, 2003). Theory of mind is a core element in social understanding. The thinking and information-processing style in ASD leads to the behavioral expression in the much published behavioral triad of impairment that underpins the diagnostic criteria internationally. The link between the impaired linguistic processing, abstraction, and theory of mind to impaired communication and social skills has been widely published and needs little unpacking. The link to restricted interests, activities, and behaviors is however less direct, has received relatively little attention, and is worthy of further discussion.

Restricted and repetitive interests, activities, and behaviors have been conceived of as potentially being made up of two constructs. The first construct consisting of repetitive motor behaviors and the second insistence on sameness, obsessions, and rituals (or interests and activities) (Szatmari et al., 2006; Wigham, Rodgers, South, McConachie, & Freeston, 2015). Repetitive motor behaviors are seen in many developmental disorders and typically developing young children (Richler, Bishop, Kleinke, & Lord, 2007). Characteristically, for those with no intellectual disability, these behaviors disappear and are replaced over time by more complex responses. In ASD, there is a strong inverse correlation between IQ and persistence of repetitive motor behaviors beyond childhood (Szatmari et al., 2006). Repetitive motor behaviors are hypothesized to have a self-stimulatory and regulation of sensory input function (Lovaas, Newson, & Hickman, 1987). This paper in considering overregulated thought and behavioral habits is not focused on repetitive motor behaviors that for people with ASD, beyond early childhood, appear a factor of comorbid intellectual disability. Instead, this paper focuses on the area that has received little attention of overly regulated thought in the form of circumscribed interests and obsessions and insistence on sameness, and ritualistic behaviors.

**ASD as a Disorder of Filters**

The unusual use of inner speech in ASD has been identified (Whitehouse, Maybery, & Durkin, 2006). ASD has been described as a disorder of filters (Frawley, 2008). For people with ASD, the filter is conceptualized as an overactive input filter; in effect, behavior and thinking patterns are employed to block input. Hence, the metaphorical response of putting ones hands over the ears to block noise (but at a less conscious and micro level). It of note that in a study of echolalia in people with ASD, a form of overly regular speech response where the other person’s utterance in the interaction is repeated back without extension, filters were again referred to. This paper did not reference Frawley, and it was conceptualized that there are underactive filters in people with ASD, as people with ASD could not distinguish between the noise and what required a response (Grossi, Marcone, Cinquegrana, & Gallucci, 2013). No other reference to filters was identified in relation to ASD in the international literature. It appears that Frawley’s description is more in keeping with the lived experience of ASD, as the integration of filters as represented in Figure 1 fits with what we know, and that is that autism shrinks (Cashin, 2003). Frawley does have a child with autism, so lots of naturalistic observation has informed his important thinking.

While not using the concept of filters, Fischer-Terworth and Probst (2009, p. 10), in considering the place of obsessive-compulsive phenomenon experienced by people with ASD, wrote that, “the persistent engagement in rigid obsessive-compulsive behaviors might serve as a protection against new stimuli being experienced as threatening.” This protection discussed in effect taking the form of filtering the noise.

**ASD and Failure of Accommodation**

The failure of accommodation has been noted in people with ASD throughout the history of classifying this group of people. In fact, the final case in Hans Asperger’s famous case series, Hellmuth, L., was described as an “autistic automaton” (Shorter & Wachtel, 2013). The nimble improvisation referred to referred as needed in the modern world is characteristic of resilience and adaptation. The more overly strong regulation in ASD prevents this nimble-footed approach to life. Improvisation does not come at all naturally for people with ASD. In effect, ASD prevents/impairs adaptation and the overly regulated thought and behaviors are causal of a large degree of the disability in ASD.

**Metaphorical Hands Over the Ears and the Vicious Cycle of Overregulation in ASD**

This overly regulated pattern that is not easily disrupted in people with ASD is a metaphorical equivalent of putting hands over the ears and standing still in the middle of the road in response to a car horn, as opposed to scanning for danger and “instinctively” (using automated or an underground response if preferring Vygotsky terminology)
jumping out of the way of an oncoming vehicle. A vicious cycle develops where the noise in the neural environment rises in response to an environmental demand, all effort is directed to silencing the noise, the demand is not met, adaptation does not occur, more noise is experienced, so more effort to blocking the noise is applied and adaptation still does not occur, this results in louder noise and the cycle continues to escalate (see Figure 1). Anxiety and other affective responses occur within the person with ASD as the cycle unfolds, but these are not labeled and hence recognized by the individual. As they are not recognized, the individual cannot act to diminish the affective response by soothing or an action-oriented response. Instead, the affective discharge acts as fuel for the rise in intensity of the blocking and filtering response to the noise/demand. The cycle is vicious as the person moves further from a positive outcome, which would arise from a virtuous cycle (Freeman, Epston, & Lobovits, 1997). The more they do not accommodate or adapt, the louder the noise becomes and this result in blocking through rigidity (or a relative deficit in fluidity). The cycle becomes tighter as the gaps between filtering and feedback become smaller. Behaviorally, this is manifested as shrinking as the person’s behavioral repertoire restricts to the filtering behavior (rituals or obsession).

Anxiety as Fuel for the Cycle

Anxiety has a natural history of promoting adaptation, as it creates the impetus to act and to allow people to return to a more pleasant affective state. People with ASD still experience the anxiety, but as it is not labeled, it becomes the fuel driving the nonadaptive response (in most circumstances) of the overly regulated behavior. The central role of causation of ASD of what are labeled as psychiatric comorbidities has recently been recognized (Tebartz van Elst, Pick, Biscaldi, Fangmeier, & Riedel, 2013). Of course, as we know so little of the brain, the comorbidity may later be better explained by underlying, yet still unknown, physical causes that are presumed to exist (Bejerot, 2007). But the model in Figure 1 at this time is equally compelling and fits with clinical presentations. If we accept that overly regulated thinking stimulated by neural noise results in increasing neural noise, followed by filtering and blocking of increasing intensity, all fueled by the anxiety in the system pushing the person to action to allow adaptation in neurotypical people but entrenching maladaptation in ASD, it makes sense that anxiety will rise to what is considered a pathological level. Studies have shown levels of anxiety that would be classed as meeting the criteria for an anxiety disorder in many young people with ASD in mainstream schools (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000). A meta-analysis identified that across studies 40% of participants with ASD had at least one comorbid anxiety disorder (van Steensel, Bogels & Perrin, 2011). Along with anxiety, depression becomes a plausible experience, as hopelessness is experienced related to persistent failures at adaptation. Depression as a comorbidity with autism is a relatively less-explored domain in terms of research (Stewart, Barnard, Pearson, Hasan, & O’Brien, 2006; Vannuchi et al., 2013). The most common form of comorbidity has been conceptualized as causally related disorders emanating from the same disease process (Nylander, Lugnegard, & Hallerback, 2008). The overly regulated thought and the sustaining vicious cycle may be just that process causing disease.
**ASD, Shifting Logic and Psychosis**

An interesting and also relatively unexplored area is the boundary of ASD with psychosis and the relationship remains unclear (Raja & Azzoni, 2010; Kyriakopoulos et al., 2015; Vannucchi et al., 2013). Psychosis is the point where illogical thinking shifts to delusional thinking as the largely social process of reality testing is abandoned in people with ASD (Eussen et al., 2015). The persons with ASD metaphorically have their hands over their ears and their self-talk consists of rationalizations in a repetitive manner to explain the demands they are experiencing. Thought turns inward as they systematically try to apply an enhanced analytical thinking process to the perceived problem, but become stuck in the overly linear nature of their inwardly directed thinking. The systematized thinking style does not benefit from the more gestalt-orientated processes that allow intuitive action (Brosnan, Chapman, & Ashwin, 2014). Rigidity that increases in the absence of socially mediated reality testing, as in Figure 1, can lead to thinking (logics) that drifts far away from accepted realities. In a study that accessed data from 8,232 participant mothers who were part of the Avon longitudinal study of parents and children in which parents were asked about autistic traits, it was determined that parents with early concerns about autism, particularly language and habits/rituals, were later more likely to have a child who experienced psychosis (Bevan Jones, Thapar, Lewis, & Zammit, 2012). The prominence of habits and rituals early in development fits the emergent picture.

The fluid boundary between classifications is only in the last 8 or so years again being discussed in relation to ASD, which since the 1970s has been seen as a very separate disorder to other psychiatric or developmental disorders. The boundaries are in fact now beginning to seem so fuzzy that a solution proposed has been to take on a new idea of adopting the term multiple complex developmental disorder (Kyriakopoulos et al., 2015).

**Central Importance of Overly Regulated Thinking in ASD**

In terms of ASD, the overly regulated thinking may have central importance in our understanding, yet it is an area within which there is a relative paucity of research (Honey, Rodgers, & McConachie, 2012). It is clear how it works with anxiety and depression from a clinical perspective and a plausible link to psychosis is apparent. The positive relationship between anxiety and the intensity of repetitive behaviors has been demonstrated by parent response questionnaires (Rodgers, Ribi, Janes, Connolly, & McConachie, 2011). The relationship with intolerance of uncertainty has been identified through screening using the Intolerance of Uncertainty Scale—Parent Version and the Spence Children's Anxiety Scale in a sample of 53 children with ASD recruited in Britain and the United States (Wigham et al., 2015). Since 2006, it has been proposed that, as well as being important in the present for people with ASD, the overly regular thinking that is not easily disrupted may also have developmental impacts (CASHIN & WATERS, 2006). Since that time, the phenomenon of neuroplasticity has been further explored in the international literature. This new understanding supports the speculated impact on development. It is hard to develop changes in the neural network related to different usage patterns when all change is resisted and energy invested in attempting to sustain sameness and predictability.

**ASD and Dynamical Systems**

Cashin (2006) conceptualized the overly regulated behavior in ASD that manifests as restricted and repetitive activities thoughts and behaviors through the lens afforded by Chaos Theory. This work has not been extended since this time and, as noted, overly regulated behavior is the point of the behavioral triad of impairment in ASD that remains relatively unexplored. The application of the thinking related to complex systems and nonlinear techniques in ASD has been restricted to electroencephalography (EEG) research. While small sample sizes have been used, it has been suggested by the authors that a nontypical type of dynamics exists in the neural system of people with ASD (Billeci et al., 2013; Gomez et al., 2014).

**Concluding and What Comes Next?**

Understanding ASD and factors that impact the well-being of people with ASD is important for all child and adolescent service clinicians. The prevalence of anxiety disorders and psychosis in this group, along with the profile of approximately 60–80% of people with ASD having no comorbid intellectual disability (Cashin, 2016), means that most nurses in practice in mainstream child and adolescent services will need to work with people with ASD. In person-centered care, understanding anxiety and psychosis is not enough, and the thinking and information-processing style of the person and the nature of their experience of disability need to be understood. To move beyond a theoretically plausible understanding of the nature of overly regulated thinking and behavior in ASD, further research is needed. The mathematical tools developed to analyze dynamical systems should be applied to measure the behavior of people with ASD who exist within the socially mediated system of humanity. Such research will consist of the mapping of the behavior theoretically described in Figure 1 to determine whether the proposed model reflects what is observed and the strength of the pattern. Anecdotally, it has been clinically observed by the authors that for children and adolescents, breaks in structured activity (such as the gap between school and university) results in the emergence of
the vicious cycle of overly regulated thought and behavior in people with ASD. One such break, and a fruitful context for study in the United States, may be the extended school summer holidays. “Although the courts have recognized that children with ASD may experience detrimental regression in their academic, social and behavioral success, there are currently no research studies explicitly examining the effects of summer vacation on regression of skills among children with ASD within the public school setting” (Cross, 2013, p. 4).

References


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