VCUG3001: Unravelling Complexity

Learning Portfolio

A Systems Thinking Approach to Understanding Autism Spectrum Disorder

Name: Carly O'Sullivan

Student ID: u5783838

Rationale

Upon reflection, the key learning I have developed from this course is an understanding of the multifaceted approaches that can be used to unravel complex issues. In this portfolio, I will explore how some of these approaches can be implemented through systems thinking to help me – and, hopefully, others – better understand an area of research in my field of psychology: autism. Through my studies as an undergraduate psychology student, in my profession as a therapist for children with Autism Spectrum Disorder (ASD), and in my personal life, I have developed my own perspective in this area. Through undertaking this portfolio, I have learned the value of widening my views to consider perspectives and strategies I have not previously considered.

NB: Whilst I have utilised APA guidelines for this essay, margins have been widened to allow me to make asides about some of the key approaches and considerations brought forward by this course, which I have highlighted and elaborated upon to show how they shaped my exploration of this topic, both broadening and deepening my understanding of ASD.

A Systems Thinking Approach to Understanding Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) cannot be comprehensively understood as the outcome of a single mitigating factor. It is not poor parenting or a vaccination 'gone wrong'. It is only through understanding ASD as part of a larger set of influences that we can begin to address it. Whilst this notion is echoed in much of the literature surrounding ASD, it is also more broadly the central insight of systems thinking. When we examine the linkages and interactions between the components of an issue, we understand its system. By applying a systems thinking approach to understanding autism, this essay will explore the potential of a systems model that incorporates dominant pre-existing psychological models and interdisciplinary perspectives. The practical implications of a systems thinking approach, including integrated intervention strategies for individuals with ASD, will be discussed.

Whilst systems thinkers suggest systems theory to be applicable across a variety of intellectual disciplines and societal, environmental, economic, and scientific areas, from biological food webs to the poverty cycle, it has had relatively limited use in the discipline of psychology. Thus far, systems psychology – the theoretical and applied study of human behaviour and experience in complex systems – has primarily been considered within the context of organisational psychology and family systems psychology (Brown, 2001). In these instances, the bulk of systems psychology literature focuses on the concept of the company unit and the family unit respectively as systems, where any problem that arises is considered an emergent property of systemic interactions between employees or between family members.

Systems Thinking

I was first introduced to the concept of systems thinking through this course. What sparked my interest in this area was its potential as a strategy for solving complex issues in psychology that does not rely upon silo-based approaches (which lack a nuanced consideration of the interaction between smaller parts of an issue) or, conversely, holistic approaches (which have the opposite issue of offering so much information that it becomes overwhelming), but instead offers a targeted approach that considers key

Developmental and clinical child psychology do not explicitly reference systems thinking. However, much of the theoretical and empirical research in developmental psychology can be clearly linked to thinking in systems. Indeed, a critical theory in this area considers "development in context" through the lens of ecological systems. Bronfenbrenner (1979) formulated this theory to explain how social roles and norms exist within the context of systems that interact with an individual to shape their development.

Clearly, there is a precedent for systems thinking within developmental psychology. This essay will argue that a systems thinking approach can offer insight into an important area in developmental psychology: autism. By considering the connections between core features of ASD through different perspectives both within psychology and in other related disciplinary fields, leverage points for current strategies in managing ASD can be found and new strategies considered. The particular systems model adopted here is based upon the work by Newell and Proust (2012) in Collaborative Conceptual Modelling.

Autism is a developmental disorder characterised by difficulties with social interaction and language development, and restricted or repetitive patterns of behaviour or interest (Hill, 2004). The prevalence of ASD both in Australia and internationally has continually risen in the last few decades (Hertz-Picciotto & Delwiche, 2009). In 2014, one in every 200 Australians was diagnosed with ASD (Australian Bureau of Statistics). With the prevalence of ASD growing at an increasingly rapid pace, research into the nature of the disorder and the most effective means of managing its features to improve the quality of life of those affected is critical. This is where systems thinking can help.

In the field of psychology, the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-V, 2013) is used as the authoritative guide to the diagnosis of mental disorders, including ASD. Essentially, the DSM-V converts the spectrum of features associated with ASD into succinct categories, which are useful for the development of targeted management strategies based on this categorical diagnosis. One of the main challenges of the DSM-V is how it uses a categorical system to approach a dimensional disorder. In ASD, as in many complex areas of research, an understanding of the wide spectrum of associated features is necessary.

Spectrums and Dimensions

In the context of our coursework, the themes of spectrums and dimensions were discussed as crucial considerations when unravelling a complex issue. I immediately connected this idea to the challenge currently faced in the issue of psychology of categorical versus

This understanding of autism is further developed through the use of models, which seek to explain the core features of ASD. Two of the dominant developmental models of ASD within psychology focus on two apparent 'deficits' present in the condition: a theory of mind deficit (referred to as the 'mindblindness' model) and executive dysfunction. Whilst neither of the approaches is perfect, a systems analysis of these models - and the relationship between the models - facilitates a greater understanding of ASD.

The 'mindblindness' model of autism, first introduced by Baron-Cohen, Leslie, and Frith in 1985, helps to explain the primary socio-communicative difficulties present in those with ASD. 'Theory of mind' refers to the ability to attribute mental states, including beliefs and emotions, to oneself and others (Premack & Woodruff, 1978). In other words, theory of mind involves an understanding of how your own perspective on the world around you is different to others' perspectives. Baron et al. (1985) suggested that it is a deficit in this theory of

mind that lead to issues with social interaction and communication for those

diagnosed with ASD. Recently, theoretical and empirical research has developed this

model to suggest that individuals with ASD exhibit atypical neural mechanisms that

arise when mentalising themselves in the context of social interaction (see: Lombardo

& Baron-Cohen, 2011; Chiu et al., 2008). Whilst this 'mindblindness' model has

furthered psychologists' understanding of autism, many individuals with ASD have

passed tests associated with a developed theory of mind, indicating that it may not be

a model that works across the spectrum (Gallagher, 2004). Furthermore, the model

does not account for other features that characterise ASD, including a restricted range

of interest, a need for routine, oversensitivity to stimuli, and repetitious physical

movements.

These non-social features of autism are better explained through the executive

dysfunction model. This theory suggests that those with ASD have a limited ability to

perform 'executive functions', an umbrella term in cognitive psychology referring to

skills that involve disengaging from an immediate context to attain a future goal

(Hughes, Russell, & Robbins, 1994). These skills, which are associated with

prefrontal structures in the brain, include impulse control, flexible thinking, and

planning ahead (Hill, 2004). A number of studies suggest that individuals with ASD

show difficulties in implementing these skills, suggesting a deficit of executive

functioning which has lead to the developing of this model (see: Rumsey &

Hamburger, 1988, Oznoff, Pennington, & Rogers, 1991; Ozonoff & Jensen, 1999).

However, much like the 'mindblindness' model, this theory is limited in that it does

not account for all individuals with autism. Those with normal to high IQ levels who

also present with ASD often do not exhibit an executive function deficit (Hill &

Russell, 2002). Furthermore, there is a lack of consensus about which executive

SYSTEMS THINKING & ASD

functions are most typically affected in those with autism across the spectrum (Hill, 2004).

A primary challenge of these psychological models of autism - and indeed the DSM-V approach to diagnosing not only ASD but also all other mental disorders - is an uncertainty in how to approach dimensions and spectrums. These two models alone are made more effective when the interactions between them are explored. For example, findings by Ozonoff et al. (1991) and Putko (2009) suggest that the development of theory of mind may only be possible through executive functioning, whilst Perner and Lang (2002) suggest a opposite direction to the relationship, whereby the ability to represent mental states (a theory of mind) is required for the development of executive functions to occur. The interaction of theory of mind and executive functioning may be due to the anatomical proximity of the areas of the brain associated with these abilities (Hill, 2004). Through considering these models collectively, a better understanding of the anomalies present in ASD is reached, revealing how a consideration of the bigger picture facilitates deeper understanding.

Interdisciplinary Approaches
The very nature of this course - with staff and students from a variety of disciplines coming together to discuss issues of complexity - highlighted to me the value in considering perspectives from outside of your own

This 'bigger picture' is improved through a consideration of interdisciplinary approaches. Whilst the bulk of literature regarding ASD originates from the field of psychology, perspectives from other relevant areas of academia including medicine, sociology, and education offer further insight into the disorder.

The medical model of disability views disability as an issue belonging to the disabled individual. In contrast, the social model of disability views society as the force that restricts those with physically diverse or neurodiverse functioning. A typical example considers a wheelchair-using person who cannot access a building

because of its stairs-only entrance. The medical model would view the person's disability as the barrier to accessible entrance, whereas the social model would see the stairs as the disabling barrier.

In ASD research and 'treatment', the medical model is criticised due to its apparent over-conceptualisation of autism as pathological. Taking on a social model perspective, Shyman (2016) argues against management strategies for ASD such as Applied Behaviour Analysis (ABA), a commonly used early intervention for children with ASD that uses the principles of learning theory to encourage adaptive behaviour. The techniques of ABA have been shown to effectively alter the developmental trajectory of some children with autism, which "enables a significant number of children to enter the educational mainstream and achieve normal intellectual functioning." (Harris & Delmolino, 2002, p. 11). Shyman (2016) criticises this apparent goal within intervention research of reaching normality. Kephart (1998, p. 11) shares this view:

"Is normal possible? Can it be defined? Is it best achieved by holding up in the offices of therapists, in special classrooms, in isolated exercises, in simulating living, while everyday "normal" happens casually on the other side of the wall? AND is normal superior to what the child inherently is, to what he aspires to, fights to become, every second of his day?"

Matthews (2009) offers insight into how the social model of disability can be implemented in the classroom to promote inclusion. This perspective suggests that through instituting a diversity of teaching strategies as part of everyday practice promotes an inclusive education. Matthews (2009) argues against the use of medical labels given to students with 'hidden' impairments, as this may result in further segregation and stigma for the affected students.

However, there are flaws in this social model that are difficult to overcome from a purely society-based perspective. In order for educators to understand the additional needs of neurodiverse students, the difficulties and impairments that these students face need to be disclosed, which is most easily achieved through a medical diagnosis such as the characterisation of ASD based on the DSM-V. Furthermore, for students with ASD to be at a level of developmental functioning that allows them to benefit from mainstream schooling, their language and social skills will first often require improvements, which studies have shown are generally best achieved through early intervention strategies such as ABA (Harris & Delmolino, 2002).

However, the social perspective does make the valid point that if neurodiversities such as autism are constantly viewed as limitations and inferior to 'normality', this can increase the stigma (including self-stigma) surrounding mental disorders. For this reason, strengths-based approaches, which emphasise the value of special skills an individual may possess, can be extremely effective (Moraine, 2015). In ASD, this includes a consideration of how heightened sensory experiences can be used as a strength to facilitate the development of other foundational skills such as attention building (Moraine, 2015).

Strengths-Based Approaches

In the context of our course, we discussed the effectiveness of focusing on strengths and utilising these areas of ability as tools to develop other weaker areas in an individual's skillset. In my work as an ABA therapist, I have learned the benefits of a strengths-based approach in building a child's confidence in their abilities.

The issue here does not lie entirely with the medical model or the social model, but rather the dichotomous thinking that views these perspectives as a binary. An interdisciplinary approach recognises the insights offered by both perspectives.

Using these insights of dimensional thinking, specific models within the psychology domain, and an interdisciplinary integration of the adaptive elements of

the social and the medical model of disability, the following systems model of ASD

has been developed to reveal how key variables can be identified to show current

feedback loops that may affect the developmental course of the disorder and to

identify leverage points that act as opportunities for effective adaptation.
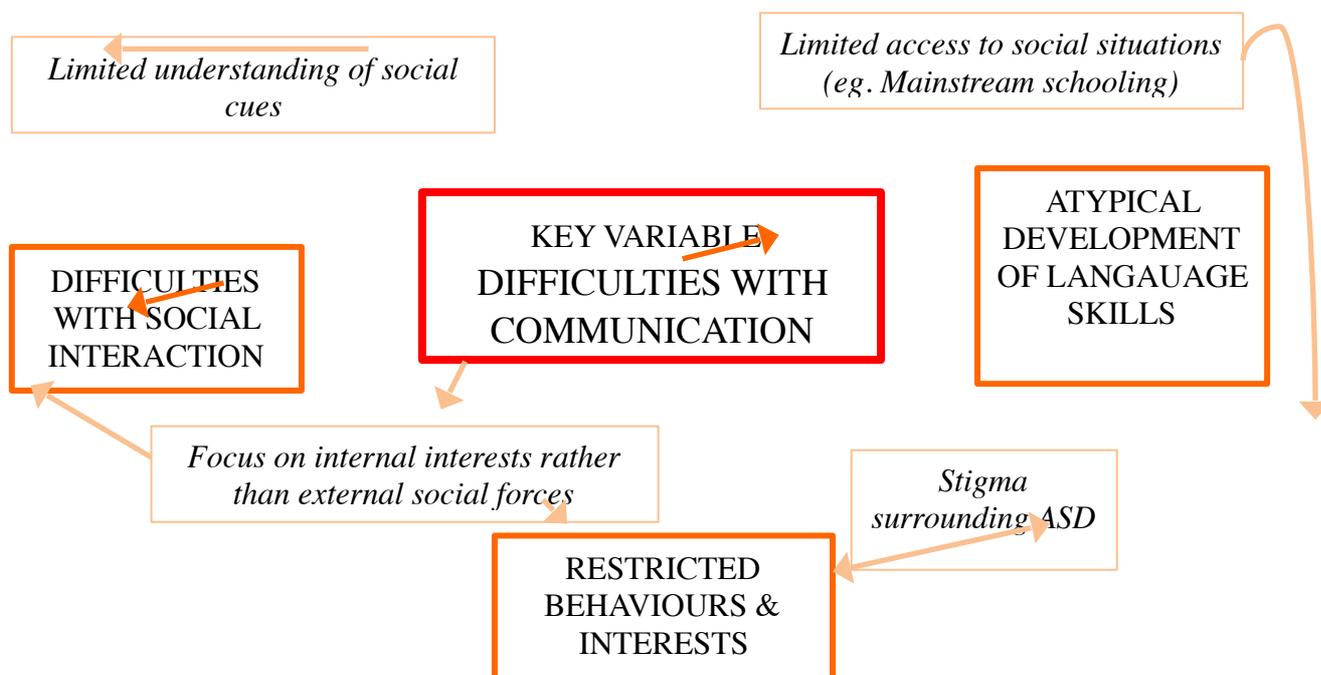

Figure 1: Example systems model of ASD that shows how 1 key variable (communication) influences the 3 core features of ASD (language, social interaction, and behaviour).

Scenario Planning, Stock-and-Flow Structures, and Leverage Points

As outlined by Newell and Proust (2012), these features of systems thinking have developed my understanding of how one can approach an issue to identify areas where change can be effectively implemented.

In a systems thinking aproach, these opportunities for effective

adaptation can be found through the practice of scenario planning

(Newell & Proust, 2012). The above model is just one example of

how a stock-and-flow structure may function in ASD. In this

example, difficulties with verbal communication skills influence

the three core groups of features in ASD: language development,

social interaction, and restricted interests/behaviours. Difficulties

with communication are associated with limited language skills, which restrict access

to mainstream learning environments at a young age. In turn, this limits the opportunities available for child with ASD to learn social cues and thus reinforces difficulties with communication, whilst increasing the stigma surrounding ASD as typically developing children have less opportunities for interaction with neurodiverse children.

In this example, a potential ==leverage point== that could be explored through scenario planning is the targeting of language skills in preschool-aged children with ASD. If diagnosis is provided in very early childhood, early intervention strategies such as ABA can be implemented to improve access to mainstream schooling when the child reaches school age. In particular, early intervention that uses a strengths-based approach to highlight diverse adaptive features present in the spectrum of autism, such as the ability to focus intensely on a special area of interest, can be used to build up these core language skills. In this example, developing early language abilities to improve access to a mainstream education system could benefit a child with ASD not only in the language domain, but also in social and behavioural areas.

It is important to note that other key variables, such as heightened stimulation from sensory stimuli, could also be used to create entirely new systems models within ASD. At this stage, this model is also purely theoretical and would require empirical testing to verify its veracity.

The model presented here offers just one example of how approaching a complex area such as autism with an approach that considers interdisciplinary perspectives, spectrums, strengths, and the interaction of key features provides a deeper understanding of the issue, which facilitates strategies for effective adaptation.

References

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th Ed.). Washington, DC: Author.

Autism in Australia: Prevalence of Autism. Australian Bureau of Statistics. (2014, June). Retrieved from http://www.abs.gov.au/ausstats/abs@.nsf/ Latestproducts/4428.0Main%20Features32012? opendocument&tabname=Summary&prodno=4428.0&issue=2012&num=&vi ew=

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition, 21*(1), 37-46. doi: 10.1016/0010-0277(85)90022-8

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, Mass: Harvard University Press.

Brown, C. H. (2001). Clinical cross-training: Compatibility of sport and family systems psychology. *Professional Psychology: Research and Practice, 32*(1), 19-26. doi:10.1037/0735-7028.32.1.19

Chiu, P. H., Kayali, M. A., Kishida, K. T., Tomlin, D., Klinger, M. R., Klinger, L. G., & Montague, P. (2008). Self responses along cingulate cortex reveal quantitative neural phenotype for high-functioning autism. *Neuron, 57*(3), 463-473. doi:10.1016/j.neuron.2007.12.020

Gallagher, S. (2004). Understanding interpersonal problems in autism: Interaction theory as an alternative to theory of mind. *Philosophy, Psychiatry, & Psychology, 11*(3), 199-217. doi:10.1353/ppp.2004.0063

Harris, S. L., & Delmolino, L. (2002). Applied behavior analysis: Its application in
the treatment of autism and related disorders in young children. *Infants and
Young Children, 14*(3), 11.

Hertz-Picciotto, I., & Delwiche, L. (2009). The rise in autism and the role of age at
diagnosis. *Epidemiology, 20*(1), 84-90. doi:10.1097/EDE.0b013e3181902d15

Hill, E. L., & Russell, J. (2002). Action memory and self-monitoring in children with
autism: Self versus other. *Infant and Child Development, 11*(2), 159-170. doi:
10.1002/icd.303

Hill, E. L. (2004). Evaluating the theory of executive dysfunction in
autism. *Developmental Review, 24*(2), 189-233. doi:10.1016/j.dr.2004.01.001

Hughes, C., Russell, J., & Robbins, T. W. (1994). Evidence for executive dysfunction
in autism. *Neuropsychologia, 32*(4), 477-492. doi:
10.1016/0028-3932(94)90092-2

Kephart, B. (1998). A slant of sun: One child's courage. New York: Norton.

Lombardo, M. V., & Baron-Cohen, S. (2011). The role of the self in mindblindness in
autism. *Consciousness and Cognition,20*(1), 130-140. doi:10.1016/j.concog.
2010.09.006

Matthews, N. (2009). Teaching the 'invisible' disabled students in the classroom:
Disclosure, inclusion and the social model of disability. *Teaching in Higher
Education, 14*(3), 229-239. doi:10.1080/13562510902898809

Moraine, P. (2015). *Autism and everyday executive function: A strengths-based
approach for improving attention, memory, organization and flexibility.*
London: Jessica Kingsley Publishers.

Ozonoff, S., Pennington, B. F., & Rogers, S. J. (1991). Executive function deficits in high-functioning autistic individuals: Relationship to theory of mind. *Journal of Child Psychology and Psychiatry, 32*(7), 1081-1105. doi:10.1111/j. 1469-7610.1991.tb00351.x

Ozonoff, S., & Jensen, J. (1999). Brief report: Specific executive function profiles in three neurodevelopmental disorders. *Journal of Autism and Developmental Disorders,29*(2), 171-177. doi:10.1023/A:1023052913110

Newell, B., & Proust, K. (2012). *Introduction to collaborative conceptual modelling*.

Perner, J., & Lang, B. (2002). Theory of mind and executive function: Is there a developmental relationship. In S. Baron-Cohen, T. Tager-Flusberg, & D. Cohen (Eds), *Understanding other minds: Perspectives from developmental cognitive neuroscience* (pp. 150-181). Oxford: Oxford University Press.

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1*(4), 515-526. doi:10.1017/ S0140525X00076512

Putko, A. (2009). Links between theory of mind and executive function: Towards a more comprehensive model. *Polish Psychological Bulletin, 40*(4), 156-162. doi:10.2478/s10059-009-0010-6

Rumsey, J. M., & Hamburger, S. D. (1988). Neuropsychological findings in high-functioning men with infantile autism. *Journal of Autism and Developmental Disorders, 20*, 155-168.

Shyman, E. (2016). The reinforcement of ableism: Normality, the medical model of disability, and humanism in applied behavior analysis and ASD. *Intellectual and Developmental Disabilities, 54*(5), 366-376. doi: 10.1352/1934-9556-54.5.366