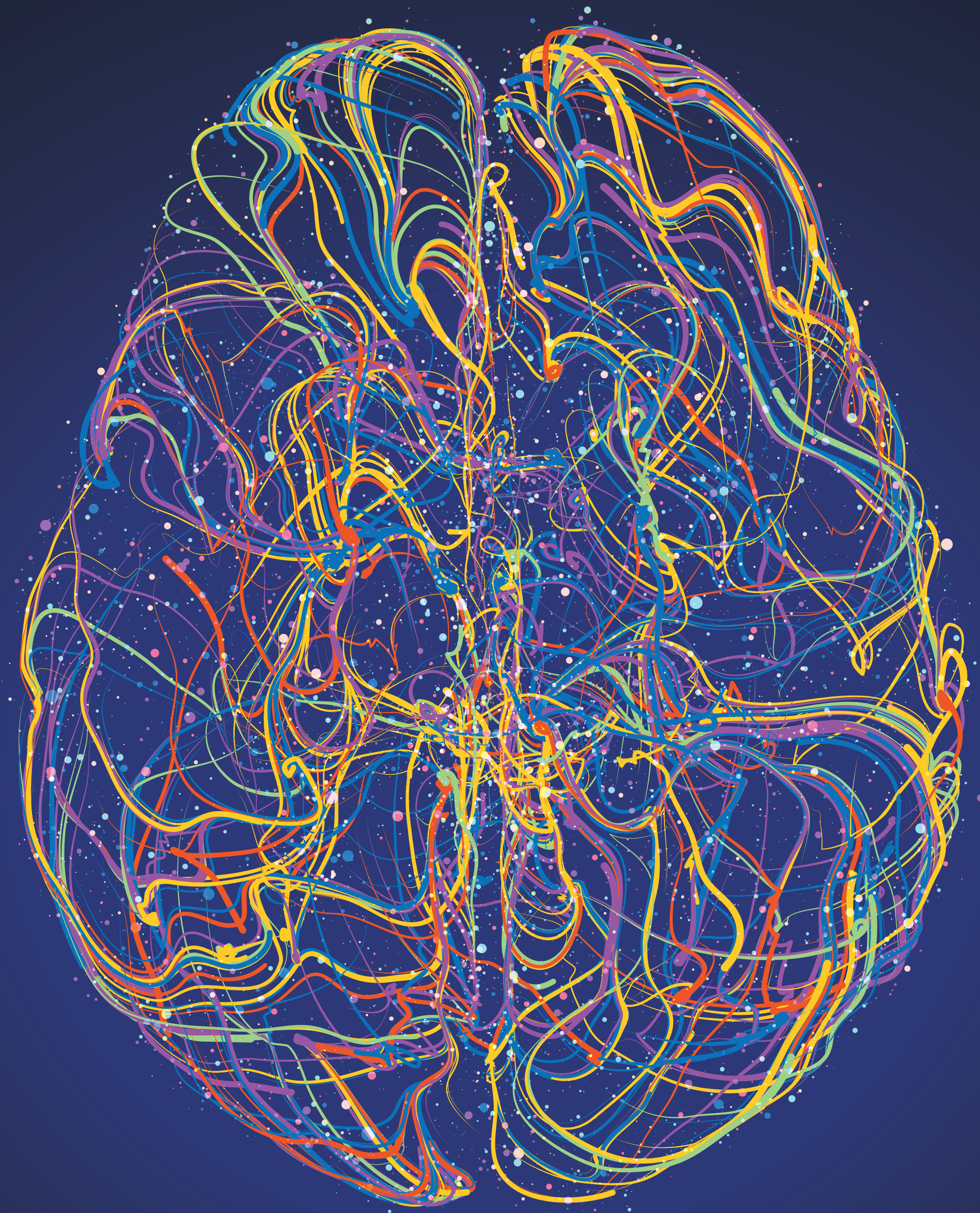

The Neurodiversity Reader

Exploring concepts, lived experience and implications for practice

Lead Editor: Dr. Damian Milton

Editors: Dr. Susy Ridout, Prof. Nicola Martin, Prof. Richard Mills and Dr. Dinah Murray

Pavilion

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Published by:
Pavilion Publishing and Media Ltd
Blue Sky Offices, 25 Cecil Pashley Way
Shoreham by Sea, West Sussex
BN43 5FF
Tel: 01273 434 943
Email: info@pavpub.com
Web: www.pavpub.com

Published 2020

A catalogue record for this book is available from the British Library.

ISBN: 978-1-912755-39-4

Pavilion Publishing and Media is a leading publisher of books, training materials and digital content in mental health, social care and allied fields. Pavilion and its imprints offer must-have knowledge and innovative learning solutions underpinned by sound research and professional values.

Editors: Dr. Damian Milton, Dr. Susy Ridout, Prof. Richard Mills, Prof. Nicola Martin and Dr. Dinah Murray

Production editor: Mike Benge, Pavilion Publishing and Media Ltd

Cover design: Phil Morash, Pavilion Publishing and Media Ltd

Page layout and typesetting: Emma Dawe, Pavilion Publishing and Media Ltd

Printed & Distributed in Ireland by: Outside the Box Learning Resources – www.otb.ie

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Chapter 1: Neurodiversity past and present – an introduction to the neurodiversity reader

By Damian E M Milton

The term 'neurodiversity' originated initially in 1998 from the work of Australian sociologist Judy Singer, who proposed it as a new category for intersectional analysis, and to suggest it as a banner term for emerging social movements for civil rights for people with various devalued, medically labelled neurological conditions. She based it on the concept of Biodiversity, and its broad argument that the more diversity within an ecosystem, the more resilient and sustainable it would be. She did not define the term, thinking it self-evident, and moved onto the main body of her thesis, which included an evaluation of the social versus medical models of disability, and also explored the notion that perhaps an "ethnicity" or "minority" model was better suited to conditions like "Asperger Syndrome" and "ADHD". This idea was taken further by others, albeit often taking an approach more aligned with the social model of disability (or variations thereof – for example see Oliver, 2013).

Walker (2014) suggested using the terms 'neurodiversity', the 'neurodiversity movement' and the 'neurodiversity paradigm'. Here neurodiversity is stated as a 'brute fact' that all brains are to a degree unique, with the embodied development of people being differently disposed in their experiences and actions. In contrast to an individualised medical model of disability, which contrasts 'normal' development with that of 'abnormal', traditionally framed in terms of deficiency and dysfunction, such a view would not place value judgements of such diversity. The 'neurodiversity movement' as a term having been adopted by those arguing for the equal human rights of those deemed divergent from the idealisation of neuro-normativity. It is perhaps the concept of the 'neurodiversity paradigm' however that has created the most controversy (and misunderstanding) in this history, described by Walker as:

1. *Neurodiversity is a natural and valuable form of human diversity.*
2. *The idea that there is one 'normal' or 'healthy' type of brain or mind, or one 'right' style of neurocognitive functioning, is a culturally constructed fiction, no more valid (and no more conducive to a healthy society or to the overall well-being of humanity) than the idea that there is one 'normal' or 'right' ethnicity, gender, or culture.*
3. *The social dynamics that manifest in regard to neurodiversity are similar to the social dynamics that manifest in regard to other forms of human diversity (e.g., diversity of ethnicity, gender, or culture). These dynamics include the dynamics of social power inequalities, and also the dynamics by which diversity, when embraced, acts as a source of creative potential.'* (Walker, 2014).

The immediate antecedent to the development of the neurodiversity movement could be said, however, to have been the coming together of primarily autistic people who were challenging the dominant ways in which autism had been classified, often referred to as the autistic rights and/or self-advocacy movement. Through both online and in-person encounters, a small but highly influential community began to grow, such as through the online networks of ANI (Autism Network International) and InLv (Independent Living on the Autism Spectrum), and the setting up of the Autreat conference in the US (and later the Autscape conference in the UK). These networks included pioneers such as Jim Sinclair, Mel Baggs, Donna Williams, Martijn Dekker and Judy Singer (among others). A seminal essay in this development was 'Don't Mourn For Us', written by Sinclair (1992), in which concerns were directed to the parents of young autistic children.

'Grant me the dignity of meeting me on my own terms – recognise that we are equally alien to each other and that my ways of being are not merely damaged versions of yours.' (Jim Sinclair)

Such work was followed by the publication online of satirical guidance in the form of the Institute for the Study of the Neurologically Typical (Tisoncik, 2019), coining the term 'neurotypical' and framing such 'normalcy' in terms of medicalised symptomology. This was followed by campaigns critiquing the work of non-autistic-led major autism organisations and campaigns that framed autism as a tragedy and even epidemic.

This burgeoning of autistic culture and community has thus been central to the formation of the neurodiversity movement, which can be seen both historically and within this collection. Yet the concept of neurodiversity was never meant to apply to just autistic people, and in more recent years more and more disability advocates have found interest (and sometimes critique) in this movement and related concepts. Over 20 years since its inception, the neurodiversity movement could be said to be 'coming of age' with a wealth of books, blogs, films and events, and an ever-growing international reach. One can even see progression into what might be thought of the mainstream media, especially in the UK with pro-neurodiversity television series such as 'The Autistic Gardener' and the children's programme 'Pablo'.

Since its inception, the autistic community and neurodiversity movement has also provided a space for neurodivergent scholarship to emerge. Early examples of this can be seen in the work of Dinah Murray (see Murray *et al*, 2005) and Wenn Lawson (2010) regarding the topic of 'monotropism' or an 'interest model of mind' (captured in the next two chapters of this collection) and Scott Robertson (2010) regarding autism and quality of life. Other notable examples being the setting up of the *Autonomy Journal* (Arnold, 2012), the AASPIRE group (Raymaker *et al*, 2019), work relating to what has been called the 'double empathy problem' (Milton, 2012; Milton et al, 2018), influence through mainstream research conferences (Robison, 2019), general texts on autism theory (Chown, 2016), critical work on autism interventions (Milton, 2014; Kupferstein, 2018) and more recently regarding autism and culture (McGrath, 2017; Yergeau, 2018; Rodas, 2018). This can also be seen throughout this collection and particularly the first section of this book.

In recent times, neurodiversity and related concepts have come under criticism from various stakeholders. Whilst some criticism may be more well founded (e.g. Russell, 2019), much of this criticism has reduced these concepts to simplistic mischaracterisations (for a discussion of which, see Milton, 2019).

This collection involves three sections. First there are a set of articles that explore various conceptualisations of neurodiversity or aspects thereof. The second section concentrates more on the lived experience of being 'neurodivergent', whilst the third section reflects on the implications of neurodiversity and related concepts on practice. No collection such as this can be exhaustive of relevant topics, and it is suggested here that this volume be seen as complementary to other such collections, particularly that of the *Loud Hands* collection (Bascom, 2012), the two autism and intellectual disability annuals also published through Pavilion Publishing (Milton and Martin, 2016; 2017), and the superb recent collection edited by Steven Kapp (2019) reviewing the history of the autistic community and the neurodiversity movement (including articles from many of the pioneers of the neurodiversity movement). This book has thus attempted to collate work which seeks to explore key issues and yet also point to the future and where the neurodiversity movement may go from here, including chapters from a number of 'up-and-coming' voices.

References

Arnold L (2012) Autism, its relationship to science and to people with the condition. *Autonomy, the Critical Journal of Interdisciplinary Autism Studies* **1** (1).

Bascom J (Ed) (2012) *Loud Hands: Autistic people, speaking*. Autistic Self-Advocacy Network.

Chown N (2016) *Understanding and Evaluating Autism Theory*. Jessica Kingsley Publishers.

Kapp SK (Ed.) (2019) *Autistic Community and the Neurodiversity Movement: Stories from the frontline*. Springer Nature.

Kupferstein H (2018) Evidence of increased PTSD symptoms in autistics exposed to applied behaviour analysis. *Advances in Autism* **4** (1) 19–29.

Lawson W (2010) *The Passionate Mind: How people with autism learn*. Jessica Kingsley Publishers.

McGrath J (2017) *Naming Adult Autism: Culture, science, identity*. Rowman & Littlefield International.

Milton D (2012) On the ontological status of autism: the 'double empathy problem'. *Disability & Society* **27** (6) 883–887.

Milton D (2014) So what exactly are autism interventions intervening with? *Good Autism Practice (GAP)* **15** (2) 6–14.

Milton D (2019) Disagreeing over Neurodiversity. *Psychologist* **32** (8).

Milton D & Martin N (2016) *Autism and Intellectual Disability in Adults* (Vol. 1). Pavilion Publishing and Media.

Milton D & Martin N (2017) *Autism and Intellectual Disability in Adults* (Vol. 2). Pavilion Publishing and Media.

Milton D, Heasman B & Sheppard E (2018) Double empathy. *Encyclopedia of Autism Spectrum Disorders* 1-8.

Murray D, Lesser M & Lawson W (2005) Attention, monotropism and the diagnostic criteria for autism. *Autism* **9** (2) 139–156.

Oliver M (2013) The social model of disability: Thirty years on. *Disability & Society* **28** (7) 1024–1026.

Raymaker DM, Kapp SK, McDonald KE, Weiner M, Ashkenazy E & Nicolaidis C (2019) Development of the AASPIRE Web Accessibility Guidelines for Autistic Web Users. *Autism in Adulthood* **1** (2) 146–157.

Robertson SM (2010) Neurodiversity, quality of life, and autistic adults: Shifting research and professional focuses onto real-life challenges. *Disability Studies Quarterly* **30** (1).

Robison JE (2019) My Time with Autism Speaks. In *Autistic Community and the Neurodiversity Movement* (pp221-232). Palgrave Macmillan, Singapore.

Rodas JM (2018) *Autistic Disturbances: Theorizing Autism Poetics from the DSM to Robinson Crusoe*. University of Michigan Press.

Russell G (2019) Critiques of the Neurodiversity Movement. In *Autistic Community and the Neurodiversity Movement* (pp287–303). Palgrave Macmillan, Singapore.

Sinclair J (1992/2012) Don't Mourn for Us. *Autonomy, the Critical Journal of Interdisciplinary Autism Studies* **1** (1).

Tisoncik LA (2019) Autistics. Org and Finding Our Voices as an Activist Movement. In: *Autistic Community and the Neurodiversity Movement* (pp65-76). Palgrave Macmillan, Singapore.

Walker N (2014) *Neurodiversity: Some basic terms and definitions* [online]. Neurocosmopolitanism: Nick Walker's Notes on Neurodiversity, Autism, and Cognitive Liberty. Available at: https://neurocosmopolitanism.com/neurodiversity-some-basic-terms-definitions/.

Yergeau M (2018) *Authoring autism: On rhetoric and neurological queerness.* Duke University Press.

Chapter 2: Mind as a Dynamical System – Implications for autism

By Mike Lesser and Dinah Murray
Autism & Computing, London, UK

In the last 20 years there has been an intensive study of non-linear dynamical systems (Abrahams & Shaw, 1988; Allen, 1998; Eigen & Winkler, 1983; Thom, 1975; Prigogene & Stengers, 1987). The flow of fluids, the collapse of engineering structures, the development of the phenotype from the genotype and human imagination are examples. These systems, although subject to smoothly varying controlling parameters, exhibit sudden changes including the emergence of formerly non-existent features.

Such revelations of formerly invisible qualities of a system mark are the spontaneous appearance of new information. We should beware of thinking of information as a locally conserved quantity. There is no law about the conservation of information. We should expect to observe the spontaneous appearance and disappearance of information. Once there was no life on this planet. Once there was no planet. Now all this has emerged.

The interest system

We believe that mind models its environment, thus increasing the ability to predict. We assume that mind links sensation, both present and previous, with action. Our model provides a description of the underlying workings of Tolman's cognitive map (Tolman, 1948; Artigiani, 1993).

In our model, we describe the link between experience and activity by an algebraic equation derived from ecological studies carried out by Peter Allen and Mike Lesser (Allen & Lesser, 1991). In the ecological model, a fundamental and limited resource, solar radiation, is competed for by a spontaneously arising hierarchy of life forms. In our model, the fundamental and limited resource is mental attention. Mental

Note: the figures in this chapter are reproduced from originals which could not be enhanced in any way to provide clearer images for the reader.

events, which we describe as interests, using the word in its everyday sense, compete for and consume attention. Interests are emergent properties of the mental process.

Interests have the following properties:

- Interests may be more or less aroused.
  - The degree of arousal of an interest is a function of the magnitude of its emotional charge.
  - Interests are aroused in as many different ways as there are emotions, but to reduce the volume of computation, and simplify presentation, we only model attraction, a fundamental reduction of all other emotions.
- Interests compete for attention, which they consume.
- The arousal of interests is modified by sensation.
- Interests arouse each other.
- An individual's personality is determined as much by the pattern of the interests' inter-arousability as by the nature of the interests themselves.
- The arousal of interests is autocatalytic.
- Interests engender activity.
- Interests are consumed by the activity they engender.

A model of the interest system

The model is expressed as a pair of spatially discretised differential equations. Our mathematical model of the interest system is a densely interconnected and highly diffusive matrix. Nonetheless, the equations produce entities which are recognisably distinct both from one another and from their common background. That is to say, despite the equations' strong diffusion terms, the model generates a landscape of distinct features. We refer to these distinct features as interests. Interests are dynamical objects, patterns of briefly stable flow, produced by fields of positive and negative feedback and the accidents of history. They have no independent existence. The particular role each one plays is dependent on the state of the entire system.

Where: N = Attention, x(ij) = Interest, y(ij) = Activity, bx = the rate at which attention becomes interests = the rate at which interest becomes activity, mx = the rate at which interest arousal decays, my - the rate at which arousal decays, w = the rate of positive feedback, f = basal rate of associational excitation of interests, p = decay factor in resource overlap with distance, d = distance from x^jj) to X(i'j*)-

$$\frac{dx_{ij}}{dt} = \Bigg(bf\,(x_{i,j}+wx^2_{i,j})+b\,\frac{(1\text{-}f)}{4}\Big(\big((x_{i\text{-}1,j}+wx^2_{i\text{-}1j})+(x_{i+1,j}+wx^2_{i+1,j})$$

$$+\big((x_{i,j\text{-}1}+wx^2_{i,j\text{-}1})+(x_{i,j+1}+wx^2_{i,j+1})\big)\Big)\Bigg)\left(1\text{-}\frac{\sum_{i'j'} x_{i'j'}\,e^{-pd(iji'j')}}{N\sum_{i'j'} e^{-pd(iji'j')}}\right)\text{- mx}_{i,j}$$

$$\frac{dy_{ij}}{dt} = \Bigg(sf\,(x_{i,j}\,y_{i,j}+wy^2_{i,j})+s\,\frac{(1\text{-}f)}{4}\Big((x_{i\text{-}1j}\,y_{i\text{-}1j}+wy^2_{i\text{-}1j})+$$

$$(x_{i+1j}\,y_{i+1j}+wy^2_{i+1j}) + (x_{ij\text{-}1}\,y_{ij\text{-}1}+wy^2_{ij\text{-}1}) + (x_{ij+1}\,y_{ij+1}+wy^2_{ij+1})\Big)\Bigg)$$

N = attention
x_{ij} = interest
y_{ij} = activity
b = the rate at which attention becomes interest
s = the rate at which interest becomes attention

m = the rate at which arousal decays
w = the rate of positive feedback
$d(i,j{:}i',j')$ = the distance between x_{ij} *and* $x_{i',j'}$
f = the basl rate of associational excitation of interests
p = the decay factor in resource overlap with distance

Figure 2.1: Mind as Dynamical System

We model the environment of mind by a small perturbation in the value of each cell in the matrix at each time step. This is a strategy used in ecological mathematics to create a neutral environment. We use this strategy in the version of the model in the illustration in order to preserve its general features. In fact, we believe that the environment of mind is not neutral but information bearing. Information in the environment would be represented by a bias in the perturbation. Social transactions are modelled by using the output of one model to contribute to the bias of the input of another model with which it shares an environment.

The correspondence between model and mind

I said earlier that the value of a model relies on both its conformity to and its difference from its object. Our model of mind differs from mind itself primarily in that it is happening in culture space, and in the circuits of a computer, rather than as part of our ideas about the functioning of a living person. The value of this difference is that repeatable experiments can be performed with the model.

Clearly, however, what the model has to teach depends on the model's correspondence to its object. I will now survey some of the salient features of this model's conformity with the contemporary understanding of mind.

Mental development

We model the emergence of the landscape of everyday mind as a fiction of sensory input and the pertaining state of the system itself, which is effectively its past. We model three distinct learning processes. The result of each of these processes is that new interests become established in the system.

2.1.2

Interests occupy more than a single cell in the matrix. They are compound, various and multifaceted, rather than homogeneous or monolithic. They are gestalts rather than ideals. New interests enter the system as sub-components of existing interests, as differing aspects of the same thing.

2.1.3

Interests come into being in the model by a process of intermittent, rapid and crisp bifurcations. The creation of interests by bifurcation models the simple linear learning process that might be described as Pavlovian. Such interests are spatially associated within the model.

2.1.4

There is, in addition to simple association, another way in which new interests may come into existence within the system. The population of interests is occasionally augmented by the sudden emergence of clusters of new interests. Our growing ability to describe sudden emergence – that is, how new attractors suddenly appear in complex systems – is illuminating many formerly obscure aspects of the development of natural objects.

We are beginning to learn how complex systems undergo transformations of their fundamental identity. Furthermore, our ability to describe complex and sudden emergence provides us with tools to describe the mechanisms that underlie inspiration, insight and intuition, and to rebut the argument that mind is simple and linear. The equations develop smoothly but also generate discontinuities, modelling both systematic thought and spontaneous mental creativity.

2.2

The propensity of the system to harbour new interests, and the consequent density or quantity of interests present in the system at any one time, is a function of the strength of the system's inhibitory feedback fields. We believe that the density of interests sustained by the system is of fundamental significance in the understanding of the behaviours identified as, and associated with, autism. We will return to this point shortly.

2.3

Our model maximises its symmetry when it is unperturbed. That is to say, whilst the model is not being perturbed, it spontaneously seeks to minimise its informational content. It does not do this by the simple extinction of interests (forgetting), but by minimising internal differences present in the entire interest system. If global symmetry acquisition is the sort of thing that happens to our minds when we sleep, then dreaming may be a vestigial awareness of the process.

2.4

The one-dimensional Voltaera-Lotke equation comes to a cyclic attractor at equilibrium. Our (spatialised) version of the equation can exhibit both micro and macro cyclic behaviour. We speculate, therefore, that cyclic behaviours such as the sleep/waking cycle and the breathing cycle may be generated by similar mechanisms to rocking, flapping and tapping. Cyclic behaviours of this kind may also be linked to such psychological cycles as adventure/reassurance and transgression/forgiveness. We speculate that cyclic behaviour may be part of the stage rather than part of the play. In the very broadest of terms we might say that we feel there just is not enough room for all the stuff in our heads to go in straight lines. It seems easier to imagine that our minds go round and round. In more formal terms, we believe that the mental landscape is comprised of processes rather than states, and that these processes are bound by strange cyclic attractors rather than by point attractors.

2.5

At this stage in the development of our equations we have attempted to map only essential mechanisms. Language and self are two areas of the proposed system which, although not specifically modelled, require special mention. We believe that embedded within the general interest system, most people have an elaborate sub-system of interests which is what they know of language. The manipulation of interest systems is an important function of language and a direct consequence of language as an amplifier of the imagination. Embedded within the language system is an elaborate sub-system which is what we think we know of ourselves. Language brings greatly enhanced detail, durability and communicability to the system of self interests, but these interests are identical in structure to the rest of the interest system.

Ego, ourselves to ourselves, is not the prime mover in our model. We believe that it is the alchemy of language which generates the apparently independent agent, transforming activity into transitive behaviour. We think that the idea of the doing and the done to is one way, just one amongst many ways, in which the world can be imagined. In our model, ego is the spontaneous emergence of a system of images of the imaginer in the imagination. Ego is an emergent property of language, far from the central machinery of mind. In our model, social actions emerge from the play of our interests, including self-interests, from our images of other people, and from the situation in which we find ourselves (Murray, 1997; Stern, 1985).

2.6

Although this model owes little to Freud, we feel that a plausible model of mind should provide some account of the notion of the unconscious mind and the idea of psychological conflict. We do not explicitly model the unconscious mind. However, we propose that just as a minimum level of arousal of an interest is required to trigger an activity, there is a level of arousal so low that it fails to trigger awareness. We do not see this threshold as being sharp or sudden, but imagine that interests at a certain low level of arousal exist at the corner of our mind in the same way we may just see something from the corner of our eye.

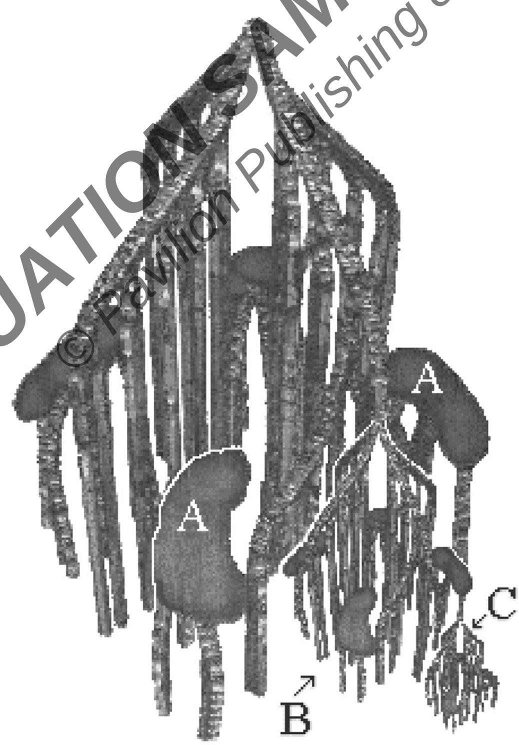

Figure 2.2: A computer graphic of development of interest system showing sudden events A. With added language system B and ego C.

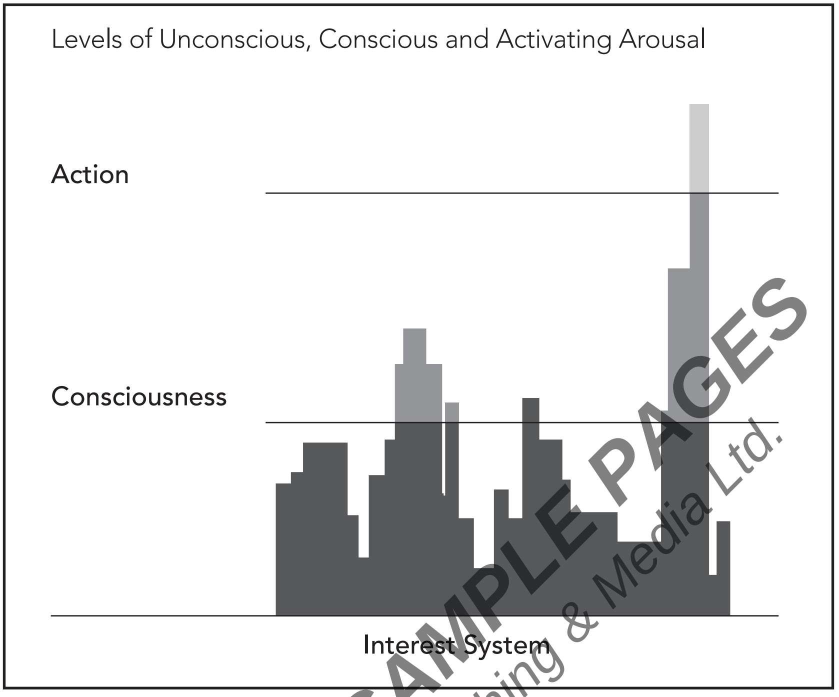

Figure 2.3: Consciousness

Interest system

Among sub-aroused interests are those at the vitally important interface with motor and other low level functions. This interlace requires interests at minimal emotional arousal, certainly below the threshold of consciousness. Indeed, its functioning is often impaired by continuous awareness, as the sportsman or the artist will attest. In our model, competition between interests is not a symptom of mental disease, but the fundamental condition of a functioning system. Behaviours are vectors whose components are conflicting interests. Psychological conflict does not arise unless attractive and aversive interests are simultaneously aroused.

2.7

The final area of correspondence that I will mention in this brief overview is biochemical. There is a parameter, N, in the model that controls the amount of attention available. Attention is the primary resource of the model. Increasing the value of this parameter N increases activity, without affecting the state of the model in any other way. This may be an idealised representation or an increase in the quantity of available excitatory neurotransmitters.

3. Born to Forage – a Model of Autism

I have outlined some of the areas in which our model resembles everyday mind to make it easier to understand what 1 mean by the model having an Autistic calibration. We believe that the attention tunnel or Monotropic Condition is a central feature of behaviours in the Autistic spectrum (Abrahams & Shaw, 1988; Williams I, 1994; Walker, 1997), In our model, the degree to which a mind exhibits the Monotropic Condition is controlled by a single parameter, Ro, which governs the strength of the feedback between interests. If the parameter Ro is set to a low value then many interests are aroused to a moderate degree. If Ro is set high then a few interests are very highly aroused. When many interests are aroused, multiple, complex, behaviours emerge. When few interests arr aroused then a few, intensely motivated, behaviours are engendered.
(Abrahams & Shaw, 1988)

Everyday Parameterisation

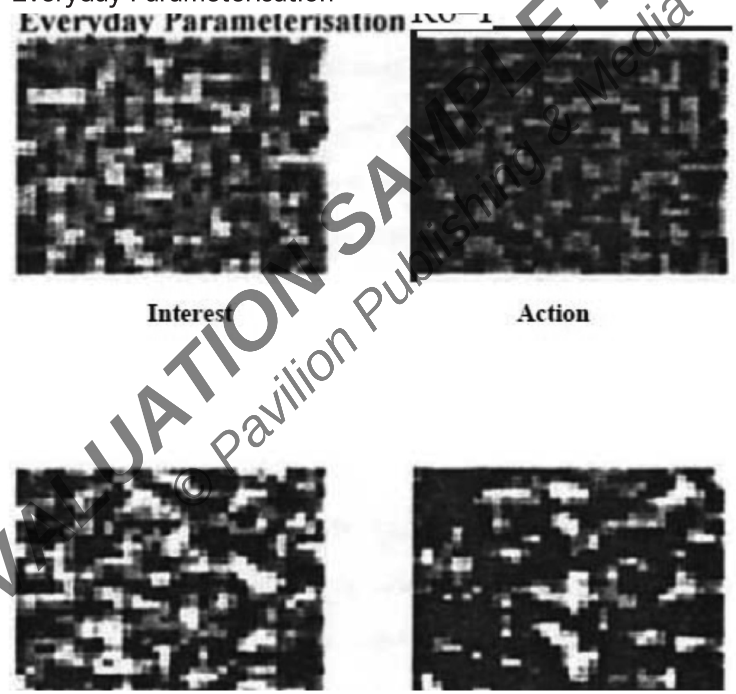

Figure 2.4: Broad arousal

Our understanding of the mechanisms which underlie the attention tunnel have informed our intervention in cases of diagnosed autism. Our work with the animator Ferenc Virag emerged from our attempts to, start where the child is, to enter his attention tunnel, to share with him a set of mutually aroused, common interests. Our choice of the personal computer as the environment in which to set up the attention tunnel also sprang from our understanding of these mechanisms (Lesser & Murray, 1997).

However, in addition to providing a theory which can be tested by experiments, certain general features of the situation have recently become apparent. We observe that, in the model, the Monotropic calibration is a particular region in a continuum of types of mind which includes everyday mind. We observe that the Monotropic Condition is merely a possible calibration of the model. It is not associated with the content, or arrangement of the contents of the model.

A theory of autism

It seems to us that the autistic spectrum of behaviours is evidence of one extreme of the normal distribution of types of mind that we would expect to find, given the environment in which the human race has evolved. It is a mind optimised for searching for sustenance in a dangerous environment in which resources are scarce. The attention tunnel which links the unarmed hunter to the prey must be optimised for the immediate high-gain, high-risk opportunity. It must have a propensity to accept what is seen, even when this contradicts what was formerly thought to be known.

It must be sensitive to immediate data rather than to pre-existent or received information, sensitive to clues to where future food resources might be concealed, rather than to knowledge of where food is presently known to be available. Such a mind must have a propensity for actual rather than literal information. It is a mind adapted for heterodoxy, rather than orthodoxy.

Such a mind seems to have the will to error, but is in fact the only sort of mind capable of discoveries that go beyond the known and transform situations (Allen & Lesser, 1991). Only error making leads to metamorphic discovery. In the light of this understanding, several paradoxes of the condition become less puzzling. The capacity for a high degree of sensory acuity is essential in the hunter. Spatial abilities are an obvious requirement. The ability to endure pain, to ignore the agony of the long-distance chase and to go without sleep have also emerged in the selection process.

The skills required in food foraging are similar to those required in war. The stories of Enkido, Achilles, CuChoran, Hercules, Perseval, boy Cornwall on the burning deck, and many other military heroes provide a lexicon of aspects of the syndrome. The stories of heroes also provide examples of exploitation of the weaknesses inherent in the condition. We believe that, where there is the capacity for extreme depth of arousal, there is often less capacity for breadth of arousal. The advantages of adaptation for depth, not breadth, of awareness are apparent in the field not in the camp, at the edge not in the centre, in crisis not in stability. People with the ability to concentrate very hard typically lack the capacity to sustain large numbers of simultaneously aroused interests.

People with the capacity for great depth of interest, adapted for pathfinding at the edge of the known, are poor at elaborate low risk/low gain social activity. This is because language and self are the most dense and complex areas of the interest system, requiring maximum breadth of modelling. We postulate that self and language tasks as they are habitually performed may require more breadth of arousal than is available in some interest systems. Many of the problems in relating to society experienced by people described as autistic are the result of different modalities of language use and of the modelling of the self, other and the words between.

The other extreme of this normal distribution of types of mind consists of people with very broad but not very deep minds. This category includes those most highly rewarded by society, chat show hosts and politicians. Such people do not possess outstanding specific talents, but have great ability to model other people, giving them power to manipulate social, rather than actual, situations.

We cannot think of autism as an illness for which a cure can be discovered (Jordan, 1998). We do however observe in people described as autistic a cast of mind that renders them unsuitable for conventional forms of employment. However, we see this economic frame of reference as holding the key to a happy outcome. In benign circumstances, people with the capacity for deep concentration have a great capacity to learn skills which are beyond the broad mind. Mass production culture may have deprived the deep minded of occasion to contribute to society as the pathfinders to physical resources, but it has opened a vast spectrum of new opportunities. It is the deep mind that has the capacity to read, understand and apply the technical manual, to enter into the intricate labyrinth of the logic of the integrated circuit and the computer program. It is the forager mind, insensitive to the way everybody knows things should be done, which creates the paradigm-transforming technologies.

Appropriate education would enable many ingenious and creative people who are now totally excluded from the mainstream of society to contribute to the economic and cultural life of the community. Education based on understanding could transform this apparent problem into an opportunity.

References

Abrahams RL & Shaw CD (1988) *The Visual Mathematics Library*. Santa Cruz, CA: Aerial Press.

Allen PA (1998) *Cities and Regions as Self-Organizing Svstems*. Gordon and Breach.

Eigen ME & Winkler R (1983) *Laws of the Game*. London: Allen Lane.

Thom R (1975) *Structural Stability and Morohoeenisis*. Reading, Ma.: Benjamin Inc.

Prigogene l & Stangers I (1987) *Order Out of Chaos*. New York: Bantam Books.

Tolman EC (1948) Cognitive maps in men and rats. *The Psychological Review* **55** (4) 189-208.

Artigiani R (1993) *From Eoislomoloev to Cosmology: The evolution of cognitive maps*. Amsterdam: Gordon and Breach.

AlIen PA & Lesser M (1991) *Evolution: Traveling in an imaginary landscape parallelism, learning and evolution*. Berlin: Springer-Verlag.

Murray DKC (1997) *Normal and Otherwise Living and Learning with Autism*. Conference Proceedings, ARU Sunderland.

Stern DN (1985) *The Interpersonal World of the Infant*. New York: Basic Books.

Murray DKC (1992; 1993) Companion volumes to this one.

Williams I (1994) In the Real World. *Journal of the Association for Persons with Severe Handicaps* **19** (3).

Walker A (1997) Sep\rate Realities. In: Living and Learning with Autism. Conference proceedings. ARU Sunderland.

Blackburn J & Andrews DN (YEAR) in our poster presentation (this volume).

Lesser M & Murray IC (1997) *'/!utism and Computing'* Video Tape. London: Autism and Computing.

Allen PA & Lesser M (1991) *Evolutionary Human Systems: Evolutionary theories of economic and technological change*. Routledge.

Jordan R (1998) *Is Autism a Pathology?* this volume.