Review Article

Living Thoroughly: A User's Guide for the Person with ASD and their Families and Friends

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Being thorough is one of the virtues of the person with ASD. For the neurotypical, such thoroughness can be tedious, if not downright frustrating, and inferred evidence of intellectual impairment, because thoroughness takes time. The purpose of this paper is to focus on the usual mental functioning of the person with ASD and to invite those who regularly interact with such a person to consider what happens for the ASD person. Along the way, there will be attempts to re-label metaphors (thoroughness, inconvenience, action, integration, personhood) that are less stigmatizing and demonstrate the strengths of those with ASD.

This work has evolved across fifteen years of referrals of people diagnosed with Autism Spectrum Disorder (ASD). Blind as could be, I would start. Slowly, I began to understand the work as a mix of my learning and their desperation to be understood. I had a lot to learn: they only wanted a listener who would seek to understand. They were grateful, despite my incompetence. Higashida, in a young teen's view of what others wanted to know about ASD, provided a major breakthrough and was given to me by my first proper case in this journey of change [1].

The psychological literature has mirrored the intolerance of neurotypicals. ASD has mostly been described in its deficits, but there are plenty of strengths. As understanding has grown, the number of people with this obscure condition have grown from dull boys in institutions to a range of very successful intellectuals of both genders.

The breakthrough for me was realizing that ASD demanded a level of rationality not usually bothered with by neurotypicals. This I prefer to call thoroughness. It is an unusual form of rationality, however, as it is based in concrete, systematic thinking, not abstract, inferential thinking.

I asked one of my intellectual ASD clients to read a draft of this paper and he reported feeling uncomfortable with the contrast of concrete with abstract. I struggled to find better metaphors: he said he likes to be clear and direct. He does not like people being "airy-fairy" or polite for the sake of being seen as polite. ASD persons are taught by Speech Pathologists (and parents) from an early age to be polite as this makes for more successful

conversations: from my observation this makes the ASD person appear robotic and/or very anxious that they may not be seen to be polite. Being polite is definitely concrete. I would be interested to hear from others who have found better metaphors to describe a difference in thinking style between those who are neurodivergent compared to those who are neurotypical.

This guide stands in contrast to the common interventions with people with ASD, which involve learning of stereo-typed behaviours that are somehow prosocial for the neurotypical person. This can involve learning of manners, politeness, and learning of speech that involves robotic expression and peculiar approximations to normal speech. These irregularities cause parents, siblings, and others discomfort with the contorted efforts to be what the ASD person is not: neurotypical. Loosening up this rote learnt behavioural routines is hard. The success of such rote learning is not based, in my opinion, on the effectiveness of behavioural reinforcement schedules, but upon the preference of the ASD person for regular, predictable interaction and thorough assessment of appropriate responses. The quirky outcomes are idiosyncratic to each ASD person and create humour for all if appreciated as authentic, but different.

On the other side of my learning has been the opus of Colwyn Trevarthen, and the burgeoning contribution of Jonathan DelafieldButt, with their participation in autism research, while retaining a psychoanalytic understanding [2-5]. They are avowed empiricists with strong claims of science. But they have always taken the transference seriously in the design of their experiments and in the discrimination of emotional factors in infantile development [2,6]. In a by-line, almost an afterthought, in a paper on autism, they suggested.

Sensitive psychoanalytically informed methods practiced for early intervention, and 'art' therapies that support willing engagement in song, musical performance or dance have been shown to be helpful both for affected infants and toddlers and for their parents [3].

Trevarthen and Delafield-Butt argued for interventions based on understanding not repetition of stereo-typed behavior [3]. Two studies presented by Delafield-Butt exemplify non-stereotyped

interventions. One where a non-verbal ASD woman is helped to communicate by Intensive Interaction therapy where the therapist attuned bodily movements and rhythms to the patient [5]. Meaningful exchange was created together. The imitation reduced anxiety, stereotypies, and challenging behaviours, and created possibilities for action, interaction, and learning. In Delafield-Butt, Dunbar, and Trevarthe an autistic woman in her late twenties (the second author) used swimming and collage to ground herself and to integrate experience [7].

As a general principle, the work needs to invoke play. Play is exploration in action, with action, and through action. Winnicott observed that one of the true attributes of being adult is the ability to play (his case studies are full of his playfulness) [8]. With autism there is a special sort of insular play that many interpret as a wish for being alone. Stimming is a form of play that precludes the participation of others but seems to calm the ASD person. Play with an ASD person opens up different algorithms for action.

It is an irony that Kanner chose the name for the syndrome as "autism" based on a symptom of schizophrenia where the patient would choose to be alone: The Ancient Greek "auto" meaning both "one" and "self" [9]. Autism is now felt to be a condition of being on one's own, not by choice, but as part of the syndrome. Yet the two case examples of Delafield-Butt are of being alone, which others have seen as a choice, but the patients felt to be the best option for being among others who did not care. Loneliness is a real challenge for persons with ASD, but being with others can be extremely uncomfortable. "Self" is a particular challenge for the person with ASD.

In this just completed introduction, I have tried to layout the intellectual field of my thinking about autism and psychotherapy. Next, I describe knowledge that the ASD person and their immediate family and colleagues can use to make for more harmonious communication and interpersonal understanding. In the third part, I present more detailed commentary on some of the underlying principles that influence the therapy.

A User's Guide to ASD
There is much evidence, to be presented later, for conceptualizing ASD differently to that of the seventies and eighties, but treatment approaches remain anchored in these methodologies, despite Trevarthen and Delafield-Butt's conclusions [3]. These arguments are mostly abstract, and many might find these difficult to follow. This is why the approach is presented first as a user's guide. If the ASD person, their family, friends, and colleagues, and any mental health professionals who are consulted, understand the following fourteen points, opportunities for productive understanding can open up. We all need guidance to help communication with people (ASD and neurotypical, alike) who do not understand what is needed to be understood.

In any treatment, the ASD person needs to work through the following phases of understanding what to do.

• Audit of Sensory Vulnerabilities
This can be done by a person by themselves or with a therapist or with family members. Each of the senses is considered with a view to unusual responses. Sight is not often a sense with vulnerabilities. Hearing can involve pitch as disturbing, as well as beat. Talking loudly can be a problem as well. Some smells may be unusual or revolting. Taste can be felt to be awful in a variety of ways, but with food, there are other vulnerabilities; for instance, slimy foods can be unacceptable with crunchy foods preferred. Some ASD

persons will only eat white foods: potatoes, some fish, chicken, pasta, rice … The arrangement of food on a plate may require separation of each type of food, and the order in which food is eaten might be regulated. Other tactile issues may concern the wearing of certain fabrics (not man-made fabric), and the feel of other objects may be pleasant and involve seeking touch without inhibition of things like feathers. Balance and proprioception will need to be checked as well. Once a person with ASD knows their vulnerabilities, behaviour can be adjusted constructively.

One sensory attribute of many ASD persons is an unexplained curiosity: highly sensitive undersoles of the feet. It is why many ASD small children walk on tip toe. The ends of the neural network seem important, and this may explain some of the movements involved in stimming.

• Audit of Rules (Algorithms)
The arrangement of food on a plate is actually a rule for some ASD persons. Some children will like to line things up and will be devastated if the line is broken. Some people will have a real sense of where certain objects belong and will be very upset by the movement of an object when, for instance, a mantelpiece is dusted. The walking on lines in a pavement can have special rules for the ASD person.

Some of these rules are predictable or readily identified. There are many rules that can only be noticed when they are broken, and a meltdown will indicate the rule failure. These breakings of a rule have a double effect: the rule failure and, then, the potential for all rules to fail.

Careful examination of the behaviour can reveal the rule, but a child may not be able to describe what the problem was during or after a meltdown. An attentive parent may be able to discern the trouble.

Developing a list of these rules can be helpful. Finding a way to include an extra step in the algorithm can bypass the rule failure.

• Recognition that the ASD Person is Different, Somehow
The ASD person receives feedback from an early age that they are different from others their own age and most others of all ages. The difference is hard to define for all involved, but the ASD person is likely to feel singled out for not being like others. Recognition of difference is a relief for many ASD persons, especially when they learn the name for this difference: autism. Unlike most other mental health diagnoses, the ASD person is pleased that there is a name for their differences and that there are others who share the diagnosis.

Therapeutically, this hard to define difference can provide obstacles to understanding and to amelioration. As the ASD person seeks to find an explanation and a template for response to the difference, errors can be made by attributing the difference to sexuality or gender, to becoming adult, to authority, and to mind. To put this in strong and radical terms: queer, child-like, eating disordered, and psychologically pre-occupied can be the destiny of the ASD person as they seek to understand this difference. Even the seeking of insight and developmental understanding can enhance the difference rather than allow for better understanding. The insightoriented psychotherapist needs to be ASD aware that trying to manifest a sense of self through expression of emotional states may be counter-productive, as this will probably strengthen cognitive control over sensory states (see "me", "I", and "self" below). That is, new algorithms for controlling (repressing)

sensory states may replace insight.

• **Using Observation to make Rules**
The rules that an ASD person self-generates may be circumstantial when very young, but as the person grows, the rules are generated from close observation of neurotypicals and their communication behaviours. These rules are then open to empirical testing, but the analysis of the observational data is slow because all possible meanings will be laboriously considered. The testing involves systematic thought experiments: that is, thinking in action.

However, the ASD person is not fastidious in all regards; many have glaring areas of chaos and messiness. This relates to the next point on fascinations. Just because when engaged with tasks all points of view need to be entertained, an algorithm is developed for some things that are deemed not to matter: as one teenager put it "I am one hundred percent or zero".

This is a difference between concrete thinking and abstract thinking that beset science for hundreds of years until Karl Popper came along. Prior to Popper, scientific proof involved repeated verification as the standard for proof [10]. This was concrete testing in action of a theory. Falsification needs only one instance to disprove an hypothesis. Popper's thinking is abstract and involves an extremely efficient short cut to validation. As might have been stated elsewhere, ASD persons hate short cuts as important instances might be missed. They want to test every option before proceeding to final implementation.

• **Understanding Autistic Fascinations**
Many ASD children get diagnosed with the anxiety disorder of obsessive-compulsive disorder (OCD). Unlike OCD symptoms, autistic fascinations come and go. They can be quite intense, but then suddenly are replaced by alternate intense interests. OCD symptoms rarely change and usually entrench with attempts to get rid of them. When an ASD child is satisfied with the understanding of a phenomenon, they will move on without any of the previous care for the object or event of formerly intense fascination. The ASD person likes to know how they function and how they can change.

• **Understanding the Anxiety of Getting Going**
This phenomenon is often understood as a motivational problem: the ASD person likes to do what they want to do. One sixteenyear-old said: "I am either 100 percent or zero". But its actually the problem of thoroughness, again. The ASD person likes to do things that have predictable outcomes, and they will reason heavily until a best form of action is derived. If they are unsure what they will do today, getting out of bed involves a very long set of cogitations about possible courses of action. That is, there are so many ways to have a wrong outcome, that getting going is an insurmountable obstacle. Better to have a standard task like cutting lunches or going to the gym: once going, this anxiety evaporates.

• **Understanding Concrete Rationality**
An ASD person will have a variety of assumptions about and expectations of events in the world and their predictability. They will expect there to be routines that recur unfailingly. They use such evidence of predictability to check on possible outcomes for any sequence of events. This is done systematically and thoroughly.

Possible outcomes are considered from all angles in a totally rational way. But this is done concretely, to prevent unpredictable occurrences. As indicated above, this thorough form of thinking is not abstract: it is direct testing in thought.

• **Understanding "Me", "I", and "Self"**
This will be expanded on in depth below, but the person with ASD needs to recognize the difference between the sensory world of "me", the cognitive, rational world of "I", and the socially constructed "self". "Self" is often elusive for those with ASD.

• **Understanding Gender Differences**
Most humans, as they develop, are fascinated by the differences between males and females. With ASD, there is a marked difference in the social presentation of males and females. These differences are based firmly in observational data. Little girls look at their mothers and their adult friends and see them engage in talking things over. The ASD girl learns that this is what adult females do, so the girl learns to chatter [11]. She does not know that the women are canvassing a range of different ideas from a variety of female peers, in order to come to a strategy for action or a conclusion. The chatter has a purpose, but the little ASD girl just sees that women chatter, and she wants to do this, too. Such chatter can be very annoying.

The little ASD boy sees their father sitting around quietly while others speak. The boy may infer that their father is listening to another's opinion or just being quiet as others speak. In either case, the ASD boy learns that men only speak when they have something to say, otherwise being a man involves being quiet.

That is, the broader gender difference of men and women in conversation becomes re-interpreted by the ASD child and produces marked differences in the way ASD girls and boys present themselves.

• **Understanding Body as Integrative Site**
These distinctions of self-reference are brought together through the concrete experience of the body. Again, this idea will be elaborated, below. Being in the body allows a sense of integration.

• **Understanding of Understanding**
Trevarthen and Delafield-Butt argued against robotic, stereo-typed intervention in ASD because the ASD person seeks understanding of understanding [3]. Politeness has a robotic form, but if you understand the purpose of politeness, you can understand better ways of navigating the world. The ASD person wants to understand particular phenomena, but they also want to understand what is the place of any phenomena in the larger scheme of things. They like to think things through, thoroughly. Non-verbal Naoki Higashida produced his book The reason I jump for the benefit of neurotypicals so that they might understand the ASD person [1]. Although speech was beyond him, he knew that understanding of understanding provided an opportunity for other humans to learn.

• **Learning to Communicate with Neurotypicals in a Way that is Unapologetic**
ASD persons often experience their attempts at communication, as interpreted by neurotypicals, to be somehow quirky, inappropriate, or weird. In turn, this induces a lack of confidence in communicating and an expectation of potentially coming under social attack. The ASD person may apologize ahead of time for what they might be about to say, but this just causes other negative social consequences.

• **Opening Up the Possibility of Relationship** ASD persons become familiar with not being included or with being ridiculed. In turn, this can create many anxieties about interacting or trying to gain friendships or relationships. The lack of positive response to attempts at friendliness is very confusing, particularly, if they attempt to emulate the friendliness of a neurotypical colleague. It is not that they do not want relationships, it is that they find relating very complicated and likely to have negative effects.

• **Using Thoroughness as Creative Force**
Being thorough, if somewhat slow, is suited to some occupations and not to others. Occupations that require spontaneity and immediate response are not well suited to ASD persons. Engineers, accountants, and IT professionals, for instance, can use their rational and systematic skills to great effect.

For Family, Friends and Colleagues
• **Acceptance of Sensory Vulnerabilities**
Family, friends, and work colleagues can help the ASD person by understanding their quirks of sensation and not be deterred when sensations seem to derail behaviour. Some sensory adaptations can be socially stigmatizing: tip toeing and stimming. The compassionate other just needs to accept these as quirks of autism and not criticize. Criticism will raise anxiety and increase the stimming.

• **Perception of Rules**
Recognizing when an unknown rule is guiding the activity of an ASD person can be very helpful in avoiding meltdown or panic attack.

• **Recognizing that the Difference of being ASD Person is no more than a Difference**
The best support for an ASD person is to accept the differences and the quirks. If the difference is manifested in gender or sexuality uncertainty, support the exploration of such options without committing to any medical re-arrangements. If the difference is with becoming adult, support the finding of models of adulthood that are alternate to the parents. If the difference is felt to be psychological, find a psychotherapist who understands ASD.

• **Accepting the Validity of Observations Made and any Conclusions Drawn**
ASD persons take their observations and conclusions seriously. Laughing at false conclusions can be very hurtful. Ask for the observational data and engage with the analysis. Avoid short cuts that are not acceptable to the ASD person. Take slow and steady thoughtfulness seriously.

• **Understanding Autistic Fascinations**
The important thing for the family member or peer is that obsessions and compulsions are not easily changed, but fascinations will pass, even if another equally annoying fascination is then presented. Ask the ASD child about their fascination (not obsession) and they will describe subtleties of shape or colour or movement that they are trying to synthesize into a predictable template of action. Enjoy the fascination with the subject, but do not be surprised when the interest moves on.

• **Understanding the Anxiety of Getting Going**
This is not an ordinary anxiety akin to fear: it is a problem of considering the effects of any particular action before any action is taken. The myriad of possible actions makes for frozen inaction and endless cogitation. Parents can help an ASD child by letting them be clear before they go to bed what they plan to do tomorrow and to have a rationale for the sequence of events that will unfold on waking. Colleagues can help an indecisive ASD peer by stressing the need for action first rather than endless questioning. Once the ASD person gets going, things can unfold well.

• **Appreciating Concrete Rationality**
Accepting that an ASD person needs to be thorough in their thoughts and actions and admiring the precision of such thought processes can be helpful.

• **Understanding "Me", "I", and "Self"**
This is rather difficult for most neurotypicals who can move easily between each of these versions of personhood. Not expecting an ASD person to understand what "self" is, will be helpful.

• **Understanding Gender as Enacted by ASD Males and Females**
This can be elusive as this is a difference that neurotypical men and women find confusing. Men get annoyed with the endless talk of women. Women are offended by their partners saying "I've been thinking about this, and I think I have a solution. This is what we will do ..." Women think being included in decision-making is important. Men think finding an efficient outcome is important.

When ASD children display their understanding of speaking and gender roles, most people are confused by the "stubborn" lack of talk from the boy and the endless, meaningless chatter of the girl [11]. Understanding gender roles can help the boy talk and the girl find a purpose for her chatter.

• **Rethink What Body Means**
Neurotypicals understand the body as the means for mobility of the mind and agency. They do not attend to the integrative experience of body for the various aspects of personhood. Yet, this could be helpful for neurotypicals to consider.

• **Understanding of Understanding**
Family and friends can help the ASD person produce adaptive behaviour by supporting the questioning of understanding that interferes with social behaviour. The younger brother on the bus to school annoys his older brother by staring at people. The ASD brother is trying to learn about usual behaviours by making intense study of others. This is not staring, despite what others think, but it has the same social effect. What the ASD person lacks is an understanding of how such behaviour is rendered in the social sphere. The boy needed help to observe the effect of his observing on others.

A mid-forties IT consultant had worked in a company for years but had rarely been included in after work social events. Newcomers to the company seem to have been invited out quite quickly. The IT consultant knows how to be friendly and is supportive of others who need his expertise. But he did not understand why he was excluded from socializing. He needed help to understand what was happening in non-social interactions in the office where his focus on task is blind to the other events happening around him.

• **Adjusting Judgement of ASD Communication**
Poor timing and failure to understand some jokes and some metaphors can perturb social interaction. The neurotypical can help the ASD person by not being dismissive or judgemental of such errors, and just accepting these as quirks.

• Relate Meaningfully in a Concrete Way

Neurotypicals need not to talk in abstract terms: preferences can be stated clearly and outcomes described. "I want to be your friend", can be a very confusing and challenging phrase as the ASD person may not know what it is like to have a friend. The wish to have a love partner can be very real and the ASD person will want to learn the steps involved in achieving such a goal. They will not understand how to go about finding a partner. Failure to achieve the goal will be very painful.

•Engage with Thoroughness as Helpful to Problem-Solving

Admire the capacity for thinking things through, thoroughly. Encourage the ASD person to take their time coming up with their thoughts.

Simply, ordinary politeness and tolerance is needed from the neurotypical. It seems strange that such social graces are sometimes not extended to the ASD person, who is usually polite, friendly, and tolerant. The difference lies in the non-social time spaces and the quirks of behaviour that disarm the neurotypical.

The Inconvenience of ASD

A recent referral, a young woman involved as an advocate for ASD, mentioned that the local Asperger's group were seeking to change their name because of the German's involvement with Nazi eugenic research during the Second World War [12]. She believed that the ASD problem is that neurotypicals find the neurodiverse rather inconvenient. This was what her younger sister had reported about her.

Inconvenience has been a central problem in several cases. Two primary school students were asked by the P-12 School Principal to take responsibility for the sand pit toys of the preppies before school. Both had been reluctant school attenders, but given responsibility, they were very happy, especially as, like many ASD persons, they had a capacity to relate well to younger children.

The boy had an older teenage brother who hated him, a father who tried to support him by taking him to movies, and a mother who was overburdened by her second son, but was studying childcare in order to learn how to best manage him. Each family member was traumatized. As already described, riding to and from school on the bus was particularly troublesome: the brother hated the way his brother just stared at people. What the younger brother was doing was trying to learn how to communicate better by watching others closely. He saw nothing wrong with this, even though it was clear it was distressing for his brother. The symptom was inconvenient for the brother.

The little girl had a younger sister and a younger brother, the father had left home and had formed a new relationship. Father did not like the way the mother confirmed the girl's autism: in his eyes, mother was "pathologizing". The sister said at the first family session: "my sister is really weird!". She felt stigmatized by her sister. Both younger children found their sister inconvenient. The older sister was bewildered by their response to her.

But this is not just about children: an engineer in the mining sector would cause great social pain for his wife. He took her to Paris for her fiftieth birthday and at a café on the Champs-Elysee, he was, once more, staring at women: a habit she hated. What he was doing was looking at faces to see if French women's way of communicating was different to that of Australian women. She had always thought of him as a "perve" looking over her shoulder

at other females: his enquiring behaviour was very inconvenient for both of them!

Inconvenience was a trouble with a young woman who worked in childcare and tried to advocate for the neurodiverse children within the centre. At a previous job she was set up to fail by her co-workers, and it took a long time before she was game to return to work. She would get complaints by her colleagues about her behaviour, but never did anything inappropriate. She was just unpredictable in her conforming to colleagues' expectations. Although this is a problem for both the neurodiverse and the neurotypical, the neurodiverse person is usually blamed for any problems. However, framing this as inconvenient does create a space for talking about the inconvenience.

Algorithmic Living

At first, I was struck by the rules that a young woman had for conducting her life. She was training to be a Speech Pathologist with the aim of working with ASD children, but study was difficult as she had to take the long way around to really understand any particular topic, and then writing her papers was tortuous as she tried to convey exactly what she understood. In many ways she seemed quite normal until she described the problem of going out to dinner with her boyfriend. As soon as the plate arrived, she had to quickly separate the various foods from each other. She then had an order by which the foods were consumed. The recent referral has the same challenge. A man in his fifties came with his wife and he described having to do this, as well. His wife of nearly twenty years had never noticed. He was an expert masker! Masking is an effect of not wanting to be seen as inconvenient.

What happens is that to manage the intensity of the sensory environment that the ASD person encounters, they develop routines that reduce sensory overwhelm and achieve predictable outcomes. Very young children develop such routines based on a paucity of information, but if a routine helps to avoid sensory overload, it will be used over and over, even if it is proven to be inadequate. When such rules fail, the ASD person goes into meltdown. The high levels of anxiety are not just the fear of being overwhelmed by the unwanted sensory overload, but also the realization that if one rule can fail, all rules can fail. This is truly frightening.

The antidote to meltdown is to be very diligent in assessing situations so that sensory overload does not happen and that responses to any demand are closely considered from all angles, before being shared. This thoroughness does make for slow responses. Parts of a conversation will have had several segments before a point can be responded to in a considered way, with the neurotypical conversationalists, aghast or disturbed by a response that was not contemporary with the ongoing chatter. ASD persons have to learn to mask in order to survive ordinary social interaction.

The rules are actually deterministic algorithms: if this, then that. Sometimes ASD persons can be helped by adding another condition to their algorithm. In a study of thinking among young ASD children, neurotypicals, and Down's Syndrome children, it was shown that the behaviour of the ASD children could be modelled by algorithms, but this was not possible for the other children. This research was extended with the use of iPads, and it was demonstrated that ASD children as young as eight months could be differentiated from other peers by the way they use this very recent invention: touch sensation for the ASD infant was somehow different, yet predictable [4,13].

An autistic patient with an IT career pointed out to me that I was using the term "algorithm" with insufficient precision. He distinguished between deterministic algorithms (which was my usage), inferential algorithms (the sort that generate endless emails when you take interest in a particular product or event), and heuristics, which promote ways of understanding without any particular outcome. These are useful distinctions, but as many rules are generated when a person is very young, mostly deterministic algorithms dominate ASD persons' choices.

The same man also took umbrage with the idea that ASD persons are not abstract thinkers. He definitely is, by the way. My point is not that such tasks are beyond Albert Einstein, it is just that most people are not abstract thinkers and that that the early experience of ASD persons makes concrete thinking a safer way to negotiate a world of challenge and discrimination. The same applies for developing a sense of self. It is possible, but less probable for the neurodivergent (see below).

Deterministic algorithms do not involve abstract thinking. They are very concrete, even while being very rational. Abstract thinking speeds up thought by intuiting patterns that do not need to be verified, concrete thinking is much slower by comparison, and needs to sample all examples. Thorough and inconvenient! But there are two other important features of ASD underpinning the user's guide presented above, to be presented following some thoughts about therapeutic use of algorithms.

Algorithmic Innovation in Therapy

There are three strategies that can be used to adjust algorithms, therapeutically. One is to add further steps or conditions to an "if, then" chain. Another is to re-contextualize a set of algorithms. The third is to create a new set of algorithms. All came up in a session recently. A mid-forties IT professional came with two problems: his autistic daughter's struggles with mean colleagues and his capacity to deal with strong emotions, especially angry or pained emotions in his children.

His daughter had begun an apprenticeship as a sous-chef and was finding the environment critical from the head chef down. The Gordon Ramsay style of head chefs is not uncommon, in my experience with depressed and anxious kitchen hands and cooks, and this leads to hostility and defensiveness in all others in the kitchen. Sensitivities are raw in such circumstances and his daughter was not prepared for the erratic behaviour of her immediate supervisor. Talking about Gordon Ramsay re-contextualized the environment for the father and then I added the following standard responses for the late teenage girl: "I like to work slowly and surely. When I am concentrating on my work, I don't concentrate on my colleagues and their feelings. I am not being rude. I am just being careful. These are my quirks. Please don't interrupt my working." He thought he could encourage her to use such responses and to see that the hostility is not of her making.

For him, I said we need to find a new field of algorithms for understanding his children's emotions. Most ASD children have been yelled at, criticized, or dismissed for their quirks and for their meltdowns. Most parents cannot deal with such overwhelm in a child and become hostile in their own overwhelm. What usually does not happen is that the parent listens to the pain, anger, and upset. He should say "I appreciate your anger, upset, and pain, in its intensity and in its honesty. It is good to express such pain. But please talk and I will listen and see if we can sort some solution to the problems". The simple miracle of listening is often not part of the ASD person's experience. There are many opportunities for

innovation and finding new algorithms for the ASD person, as they will have trained their parents into a narrow, safe, set of responses.

There is one more way to innovate algorithmically: play. The situation could be worked through with drawings or toys and novel outcomes could be explored. In the playing, concrete rationality can emerge. The purpose is to make art rather than perform design.

"Me", "I", and "Myself"

The ASD person has the social impairment of inconvenience, an insistence on regularity that seems rigid to others, and a thinking style that is different to most neurotypicals. ASD persons do not like taking short cuts in their thinking, but neurotypicals do this all the time. Secretly, ASD persons will consider the neurotypicals to be lazy, while suffering the accusation made to them that they are "slow".

There is a lot going on beneath the surface for the neurodiverse when communicating with the neurotypical, but there is another significant feature that tangles communication. At the heart of the tangle of communication is the tripartite self-referencing of the human: "me", "I", and "myself": subject (experiencer), agent (thinker), and object (continuity of personhood across time). The neurotypical moves easily between these positions, and can occupy more than one position simultaneously, but it is asserted here, this does not happen easily for the ASD person. Further, the ASD agent and the ASD subject are in such opposition that there is very little opportunity for the person to receive feedback or reflect upon who (ASD self) they are. Self has to be understood as appreciation of a person by others across time and context: it is an interpersonal presentation that is secured through interaction with others: such interaction is fraught for the ASD person and, rarely, allows for the development of an identifiable sense of self. The child care worker described having "a beast", "a tactician", and "a fuzzy mediator" (see Table 1 below; having written this, a reader pointed out Al-Ghani's book for autistic children on The Red Beast) [14].

The lack of self is not through the lack of trying; rather it is because of the amount of time and energy spent in experiencing the sensorial world and the management of the overwhelm by the thinking agent. The agent steps in to manage sensory overload with the slightest sign of sensory input. The management involves the application of rules for action (algorithms). There is little opportunity for reflection upon self as soon the next sensory wave will arrive and the next defense through thought is implemented.

The following are the key concepts in this new rendering of how ASD influences communication. Sensory information challenges the integrity of the person who immediately instigates action to manage the sensation according to algorithms previously developed. While keen senses are developed, and cognitive strategies are adopted, little time and energy can be spent on the development of the sense of self. At this stage, this has to be considered conjectural, but as will be seen in the case and in the chart below, discrete symptoms can be mapped in terms of "me", "I", and "myself".

To repeat, there are three parts that do not integrate or co-occur as they do for the neurotypical person
- **Me:** communicative oddities and sensory vulnerabilities
- **I:** cognitive controls (rules)
- **Self:** interpersonal presentation (continuities of behaviour, values, beliefs)

The table below is designed to discriminate between manifestations of autistic phenomena for "me", "myself", and "I". The table was constructed intuitively, based on my experience with many ASD people, but inspired by the child care worker. There is a strange interpersonal geometry that confuses the neurotypical person, and has always caused the ASD person perplexity: what is it with these people!? The answer has been hiding in plain sight. Whatever the brain changes involved in ASD, the relating of the ASD person is confounded by the way we use language (as if this is uncomplicated!).

The table can be explored not just by comparisons across the dimensions, which have clear distinction, but also by the much fuzzier differentiations within some of the columns. The "Reactivity" column is an example of clear differentiation. The "me" is overloaded and not sure how to respond. The "I" is rapidly searching for the best response across the whole range of potential responses. "Myself" appears detached, uninterested, and worried.

The "Presentation" column involves a nesting of ideas with "me" experiencing sensory input and having breakouts of sensory overload. Rules are developed by the "I" to manage sensory information. All this is contained by "myself", a shell, which is perceived by others to be empty.

The "Relating style" column has a similar nested character, also. With "me" experiencing overload, "I" using concrete thinking to manage the sensation, and "myself" using stereo-typed responding learnt from watching others or taught directly by intervention specialists (speech pathologists, behaviour analysts).

On the other hand, the "Thought" column is not self-evident. "Me" does not really think; discerning sensory differences is the usual cognitive activity. "I" is the cognitive agent, but wants to understand in depth, cursory templates for appropriate action may work, but are confusing. "Myself" is a very difficult concept, but can be located within certain contexts.

There is a strange interpersonal geometry that confuses the neurotypical person, and has always caused the ASD person perplexity: what is it with these people!? The answer has been hiding in plain sight. Whatever the brain changes involved in ASD, the relating of the ASD person is confounded by the way we use language (as if this is uncomplicated!) to refer to ourselves and others. The neurotypical person does not have this challenge and does not realize that in using these terms they are creating confusion for the ASD peer.

There is a further complication. Winnicott wrote of the development in early life of a "false self". Borderline personality Disorder diagnosis involves description of a "false self" [15]. This is not the same for ASD because the self is not a performance for the other that hides the private experience from the public experience. The ASD person is not sure whether they have a self. But neurotypical people believe that the ASD person knows what a self is and interact with this assumption. I have met families where siblings of an ASD member use various strategies to distance themselves from their weird or quirky sibling. This double life of private versus public performance can lead to "false self" presentations among the neurotypical siblings and parents. In turn, the ASD member can observe the difference between true sentiment and public presentation. Although, not having a strong sense of themselves, ASD people can pick up inauthentic sentiment readily as they observe such phenomena very closely as a means for survival. One older ASD man recalled how as a teenager he worked out how to change his manner such that he could be attractive to teenage girls: he wanted a girlfriend! He now regrets doing this as he lost contact with whoever that pre-decision person was.

Table 1: Differentiation of the Personhood Concepts

Entity	Nickname	Position	Manifestation	Reactivity	Relating Style	Thinking Style
Me	Beast	Second person (subject)	Meltdowns, Sensorial	Slowed responding	Sensory overload (Overwhelm)	Sensory discrimination problems
I	Tactician	First person (agent/actor)	Rules for managing input/resolving difficulties	Option searching	Concrete problem-solving	Understanding
Myself	Fuzzy mediator	Third person (object)	Empty hard shell	Detached, worried	Stereo-typed communication (gender, age)	Sense of self (contextualized)
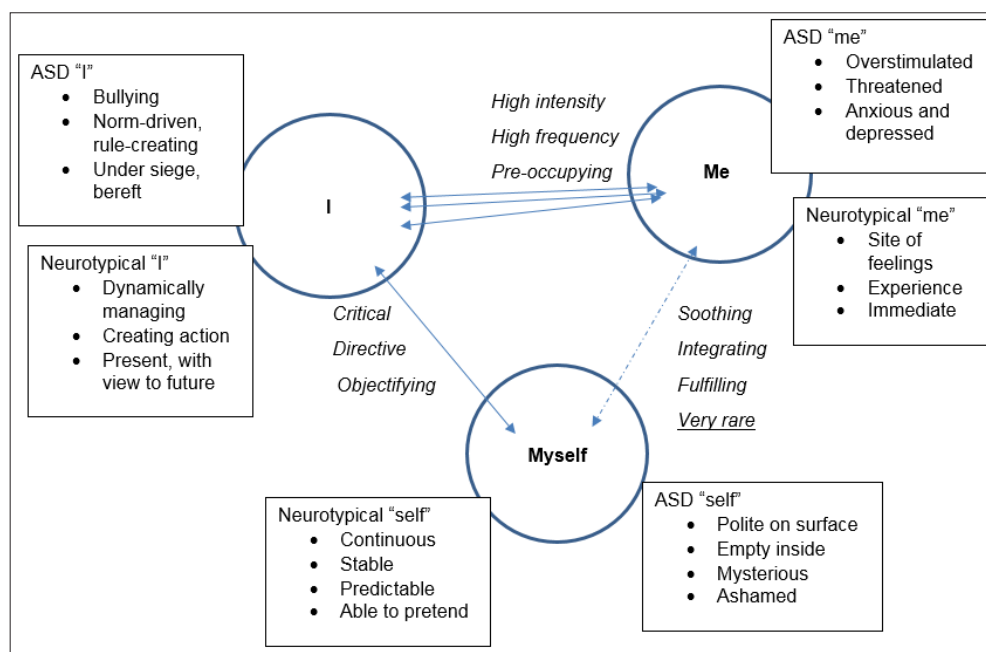
Figure: Representation of Neurotypical and ASD "Me", "I", and "Self"

The ASD person spends much time between the subject and the agent. The neurotypical person will do this as well, but can self soothe with feelings and can analyze from a third-party position. The childcare worker could write intense poetry and use the poetry to understand her predicaments. She aspired to write a novel, and she can describe the world from a third-party position. But she cannot write dialogue as this involves taking a third-party position with respect to interactions.

An Imaginary Internal Dialogue between "Me", "I", and "Self"

The diagram above was shown to the child career client and she found it difficult to decode, so I talked her through the pairwise interactions between each of "me", "I", and "self". Between "me" and "self" there is little exchange

"Help me soothe, there is so much stimulation!" "Please listen" "Who are you anyway?" "Not sure but do want to help … that agent thinker just comes over the top …" Between "I" and "self" there is little exchange:
"I can manage this … yeah, who are you anyway …" Between "I" and "me" there is much exchange, often in the form of bullying: "Follow the rules and things will be okay" "What if the rules don't work?" "They work! … I will use this one!"

As indicated in the table above, the childcarer characterized "me" as "the beast", "I" as "the tactician", and "self" as "the weak mediator". She found herself very much stuck in her head and unable to make real contact with the world. The interactions allow little opportunity for third party reflection, except after a long time later.

Further, the childcare worker self-harmed by stabbing her thighs or scratching her wrists. She bore some disguising tattoos. Self-harming is often associated with borderline personality disorder and young ASD people can find themselves with this label, as well. To me, this self-harm is the making concrete feelings of instability of personhood: "there is something wrong with me!" and "I must feel me!" and "is there anything inside me?".

A New Phenomenology of ASD
ASD has a range of symptoms, many of which are sensory, some of which are cognitive, and a few concern the sense of self. These can be arranged in a table that is attached here as Appendix I. The list was compiled by accessing several ASD assessment proformas (AQ [16], ASAN [17], ASSQ [18], CARS2-ST [19], MCHAT-R [20], RAADS-R [21], AAT [22]) and listing the descriptors found within. This is not final product but rather an attempt to assemble signs and symptoms in a novel way that takes account of the communicative intent and position of the ASD person. There is also a short list of fifteen other (miscellaneous) indicators that I use in my practice to augment other instruments, including the diagnostic criteria of the DSM-5 [23]. I would appreciate feedback on this table and any research interest that it might provoke.

In Appendix 1, differentiations are made again using "me", "I", and "self". Deterministic algorithmic living is central to the experience of being autistic and the term is intended to move judgements of others from disdain to difference in lifestyle and from deficit to potential superpower. That is, ASD is a neurological difference, but it does not need to be a source of stigmatization. It is hoped that this new phenomenology can help the ASD person describe their experience more precisely for others. It is hoped that the clarity that comes with this table in aligning the symptoms with "me", "myself", and "I" may also help with more accurate diagnosis and clearer explanations or understandings for the ASD person and for those with whom they interact.

Another feature of this Appendix 1 as work in process, is that the symptoms are revealed actively at the level of bodily experience by the ASD person. Vegetables touching on a plate produce direct action. The seeming passivity to the symptoms masks the active response that adverse sensory experience otherwise produces.

The Body as Pathway for Integration
Delafield-Butt, Dunbar, and Trevarthen have examined the way the second author, called "Pum", has used swimming and art to produce a sense of integration of body and context [7]. She could pull together disparate media and make a whole and she could

pull together personhood and make a whole. All through bodily activity that did not require self-reflection: just concrete action. With such wholeness a sense of self could emerge.

This section of the paper is, perhaps, the most likely to not be understood. The argument is one of reverse logic: it is in action that wholeness can be appreciated. Neurotypicals do not have this challenge. They can see themselves from across the room and adjust action to express self.

If there is a problem with socializing and feeling like a "self", the concrete solution is to place the problem in the domain of the body, not communication. Yet the problem is manifest in social exchanges, so the body is the site of the social problem. For some ASD young people, this creates the concrete realization of gender misallocation. Simply, the body is "wrong".

The Body as Gender Diverse Solution
In reviewing the work of the Gender Clinic at the Tavistock Institute in London, psychoanalyst, David Bell, observed a lack of rigour and a lack of training in the counsellors who supported a group of young natal females to seek surgery and medication to become trans males [24]. In their mid-twenties, some of the trans men regretted the decision to undergo surgery and reverted to their description of themselves as female. There was a range of psychological presentations associated with the request for transition: only some of whom were diagnosed with ASD. The set of tragedies that had followed such simplistic acceptance led to clinic closure by the Department of Health, followed by an in-depth review of the program and its practices [25].

Bell was not belieing the possibility that gender misallocation was a real experience, rather he focussed upon the need for expert assessment of any child seeking gender reassignment, including assessment of ASD, and rigorous questioning of the child's intention, before any medical or surgical intervention was considered [24]. The simple assertion of misallocation had been enough at the Gender Clinic for medication treatments to begin (puberty blockers, female hormones) in preparation for surgery. Specialist services were accepting the concrete claims of the young people that they had been misallocated as evidence of a need, rather than just a wish to be different. Bell advocated serious clinical attention to the relationship the young person had with their body. But with the autistic person, psychotherapeutic enquiry is more difficult.

The body is located in a socio-linguistic space that confuses the neurodiverse and the neurotypical into speaking as if each agrees that the "self" is understood in the same way. It is not. There is also much misunderstanding of concrete thinking and its rigour, and the need for understanding among the neurodiverse.

The socio-linguistic space of "me", "I", and "self" is one source of communicative confusion. A second source of confusion is the double take in the word "sense": sense is used for organs that detect certain data from the environment (sight, sound, smell, taste, touch, balance, movement) and for rationality. For the least cognitive of human functions and for the most cognitive we use the same word! Movement gives a sense of the body as a whole. This apprehension of a body as an observable, integrated whole, locates the capacity to think about the body and its interaction in space and with others. In turn, this awareness of wholeness allows for the rational sense of experience. But if the senses are overwhelmed, then the immediate management of subjectivity

brings thinking forward as a means for regulating sensation, rather than as a form of observation of self as whole. The "I" is narrowly focussed, the "me" is sensorially overloaded, and the "self" is diminished or emptied.

Without going into what is called the Movement Sensing perspective in great detail, an understanding of the aetiology of autism has emerged those focusses upon development in the womb [3,26]. There is real evidence that autism is the effect of differences in movements emanating from very early neurological differences that are prior to cortical development. Unusual movements of neck and head are associated with autism, as are movements of the limbs, especially the legs. Called the Movement Sensing perspective on early neurological development by Torres and Whyatt, the proposition is that because movements are different, responses evoked in others in social situations are different, and these differences in repertoire and response interact to interfere with typical forms of relating that precede language use [27].

Care staff were concerned that an eighteen-year-old non-verbal woman was psychologically distant and aggressive [5]. She was referred for Intensive Interaction therapy. This involves the therapist, who was the developer of the method, in attuning bodily movements and rhythms to the autistic partner. The first session involved nineteen different episodes of narrative exchange and resulted in quite close mutual exchange toward the end of the session. These episodes were video-recorded and microanalyzed. Through close imitation of movements and expressions, meaningful exchange was co-created. Imitation reduced anxiety, stereotypies, and challenging behaviours, and created possibilities for action, interaction, and learning. Psychological integration was generated through bodily action.

Psychological Approaches to ASD
Typically, the ASD person does not have a developed sense of self. Is Bettelheim's "empty fortress" being reinstated here? Are we also looking at a resuscitation of Baron-Cohen's "theory of mind"? Possibly, but in a fresh way that might make more sense of these previous ideas [28,29]. Both of these were examples of differing but flawed or limited phenomenologies of autism.

Bettelheim focussed on the problem of self as developed through mother-baby interaction: the "refrigerator mother". Baron-Cohen focussed on the cognitive management of interaction and inferred a social deficit in the ASD person, rather than an interactional tangle [28,29]. Cognitive behavioural Therapy (CBT) focusses on thought as a means to control sensory input: ASD persons know how to think about feelings, but do it much too much. Applied Behaviour Analysis (ABA) approaches to autism focus upon the sensory-driven behaviours with the purpose of eliminating aberrant behaviours, by-passing the strong need for understanding of the ASD subject. Each of these approaches address one aspect of the experience of ASD.

Trevarthen and Delafield-Butt suggested that psychoanalytic (and art and music therapies) approaches are likely to be more helpful, as the ASD person lives through understanding and by learning how to manage feelings through expression [3]. This is my background, but there are several other modifications to technique that is needed. Firstly, there is a need for psycho-education of family members and the subject. But this is based on a new phenomenology of ASD and a different understanding of inconvenience, algorithms, and concrete thinking, as communication is tangled by understandings of personhood. The work has to happen with family and with

parents, and sometimes, when the ASD member is feeling adrift, with supportive counselling.

The cases of Delafield-Butt, et al. documented how attunement to bodily movement and the use of movement to integrate functions through the body are not exercises in robotic repetitions of behavioural regimes, but rather elegant applications of the need to allow the autistic subject to find themselves in movement [5,29]. Finding themselves is perhaps the key point to any psychotherapy with an ASD person. The means of such integration will vary according to fascinations and preferred modes of experience. But insight for insight's sake may confound things.

The therapy needs to be framed for the ASD person because they like to have an organized approach to most things. They have to be alerted to the exploratory nature of the procedure and to agree to put on hold disbelief. They also need some coaching about the attention to trauma. It is one of the side effects of the communicational difficulties of autism that the ASD person misses signs of adverse intent from others. Therefore, they are more likely than neurotypicals to encounter trauma and less well equipped to deal with trauma by the process of talking things through and letting go of anxieties. Letting go is an unfamiliar practice for ASD persons.

But an important feature for therapists working with traumatized ASD subjects is an appreciation of what it is like to live as a minority in the neurotypical world. There are several accounts of algorithmic living [31,32], but the most accessible are two books by Naoki Higashida, a Japanese boy who wrote the reason I jump as a twelve-year-old and, then, Fall down seven times, get up eight, as an eighteen-year-old [1,33]. He succeeds in telling his neurotypical audience why his inconvenient actions are logical.

As an aim, therapy needs to enhance understanding without enforcing algorithms of cognitive control. Thoroughness must be engaged as a source of change. Algorithmic innovation can add steps to chains, re-contextualize, or cultivate a new set of algorithms in a previously unregulated domain. I hope that we can all re-think what it means to be ASD. Play is a pathway for making new algorithms [8].

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Appendix 1: Each Cell is a Quotation from the Relevant Test

	Autism-Spectrum Quotient Test (AQ) [16]	ASAN [17]	Autism Spectrum Screening Questionnaire (ASSQ) [18]	CARS2-ST [19]	M-CHAT-R [20]	RAADS-R [21]	Adult Autism Test [22]
	1 Social Interaction Difficulties						
S	1.1. Poor eye contact, or staring from unusual angle		14. Child has deviant style of gaze		14. Does your child look you in the eye when you are talking to him or her, playing with him or her, or dressing him or her?	1. I am a sympathetic person. (NOT)	12. It's difficult for me to understand other people's facial expression and body language
I	1.2. Ignores when called, pervasive ignoring, not turning head to voice	2. I'm often unsure about which behaviors others expect from me and are considered appropriate for a given social situation.		8. Listening response	2. Have you ever wondered if your child might be deaf?	18. I understand when friends need to be comforted. (NOT)	37. I am an understanding type of person. (NOT) 48. I try to be as helpful as I can when other people tell me their personal problems (NOT) 53. I am considered a compassionate type of person. (NOT)
M	1.3. Excessive fear of noises (vacuum cleaner); covers ears frequently	16. My sensory reactions seem extreme; I react strongly – or not at all – to sound, texture, smell, temperature, foods, and other forms of sensory input.			12. Does your child get upset by everyday noises?	36. Sometimes the sound of a word or a high-pitched noise can be painful to my ears. 57. Sometimes I have to cover my ears to block out painful noises (like vacuum cleaners or people talking too much or too loudly). 71. The same sound sometimes seems very loud or very soft, even though I know it has not changed.	4. I am very sensitive to noise and will wear earplugs or cover my ears in certain situations
S	1.4. In his/her own world (aloof)		3. Child lives in a somewhat world of his/her own with restricted idiosyncratic intellectual interests	3. Emotional response	1. If you point at something across the room, does your child look at it?	23. Meeting new people is usually easy for me.(NOT) 55. It is very difficult for me to work and function in groups 61. I am considered a loner by those who know me best.	7. I find it easy to talk in groups of people (NOT) 17. I like meeting new people (NOT)
I	1.5. Lack of curiosity about the environment	5. I prefer to do things on my own rather than with others.	5. Child has literal understanding of ambiguous and metaphorical language		5. Does your child make unusual finger movements near his or her eyes?	21. It can be very intimidating for me to talk to more than one person at the same time	8. I am more interested in finding out about 'things' than people

I	1.6. Facial expressions don't fit situations	6. Social interactions are exhausting. I put a lot of effort into monitoring and following social conventions.	26. Child has markedly unusual facial expressions	7. Visual response	6. Does your child point with one finger to ask for something or to get help?	3. I am often surprised when others tell me I have been rude 79. I am often told that I ask embarrassing questions	5. Sometimes people say I am being rude, even though I think I am being polite.
M	1.7. Inappropriate crying or laughing	7. I feel I have to "act normal" to please other people and make them like me.			11. When you smile at your child, does he or she smile back at you?		
M	1.8. Temper tantrums, overreacting when not getting his/her way	8. I think a lot about my body language and facial expressions when interacting with people.					
M	1.9. Ignores pain (bumps head accidentally without reacting)	9. I find changes to my routine, no matter how small – like taking a different route to school or work – stressful and frustrating, even distressing.				9. I focus on details rather than the overall idea. 59. Sometimes things that should feel painful are not (for instance when I hurt myself or burn my hand on the stove).	
M	1.10. Doesn't like to be touched or held (body, head)	10. I have often been told that I'm rude or impolite – a comment that always catches me by surprise.			10. Does your child respond when you call his or her name?	19. I am very sensitive to the way my clothes feel when I touch them. How they feel is more important to me than how they look 74. I don't like to be hugged or held.	
M	1.11. Hates crowds, difficulties in restaurants and supermarkets			1. Relating to People		5. I often don't know how to act in social situations. 14. I'd rather go out to eat in a restaurant by myself than with someone I know	1. I prefer to do things on my own, rather than with others.
M	1.12. Inappropriately anxious, scared	12. It's often tricky for me to work out what someone is thinking or feeling just by looking at their facial expressions.	12. Child lacks empathy	10. Fear or nervousness	13. Does your child walk?	12. Sometimes I offend others by saying what I am thinking, even if I don't need to	21. It's important to me to carefully plan any activities I am going to do
M	1.13. Inappropriate emotional response (not reaching to be picked up)	13. I often zoom in on or focus intently on details and thus sometimes miss the "big picture."	13. Child makes naïve and embarrassing remarks		7. Does your child point with one finger to show you something interesting?	13. I only like to think and talk about a few things that interest me. 58. I can chat and make small talk with people. (NOT)	13. I don't have any problems making small talk with new people (NOT)

M	1.14. Abnormal joy expression when seeing parents	14. I really don't like to stray from rules, set procedures, and the "correct" way of doing things.			9. Does your child show you things by bringing them to you or holding them up for you to see — not to get help, but just to share?	
S	1.15. Lack of ability to imitate		15.Child wishes to be sociable but fails to make relationships with peers	2. Imitation	15. Does your child try to copy what you do? 3. Does your child play pretend or make-believe?	15. I cannot imagine what it would be like to be someone else 38. I do not connect with characters in movies and cannot feel what they feel.	15. When I was young I used to play lots of 'let's pretend' or imaginary games (NOT) 6. I find it easy to imagine what characters from a book might look like. 23. I would find it really hard to play imaginary games with children
	2. Speech and Language Delay						
I	2.1. Loss of acquired speech						
M	2.2. Produces unusual noises or infantile squeals		7. Child invents idiosyncratic words and expressions 9. Child expresses sounds involuntarily: clears throat, grunts, smacks, cries or screams 21.Child has involuntary face or body movements			20. I like to copy the way certain people speak and act. It helps me appear more normal. 54. I get along with other people by following a set of specific rules that help me look normal.	20. New social situations make me feel anxious
M	2.3. Voice louder than required		8. Child has a different voice or speech			4. Sometimes I talk too loudly or too softly, and I am not aware of it	
M	2.4. Frequent gibberish or jargon					22. I have to 'act normal' to please other people and make them like me.	
I	2.5. Difficulty understanding basic things ("just can't get it")		23. Child has special routines: insists on no change 19. Child is poor at games: no idea of cooperating in a team, scores 'own goals'	12. Nonverbal communication	18. Does your child understand when you tell him or her to do something?	27. I take things too literally, so I often miss what people are trying to say. 39. I cannot tell when someone is flirting with me. 35. The phrase 'I've got you under my skin' makes me uncomfortable	19. I find it easy to work out what people are thinking or feeling just by looking at their facial expressions (NOT) 22. I find it hard to work out what people's intentions are
I	2.6. Pulls parents around when wants something				17. Does your child try to get you to watch him or her?		

I	2.7. Difficulty expressing needs or desires, using gestures				25. It is difficult for me to understand how other people are feeling when we are talking. 28. It is very difficult for me to understand when someone is embarrassed or jealous. 44. I cannot tell if someone is interested or bored with what I am saying. 60. When talking to someone, I have a hard time telling when it is my turn to talk or to listen. 68. I can tell when someone says one thing but means something else. (NOT)	25. I am often the last person to understand a joke
I	2.8. No spontaneous initiation of speech and communication			16. If you turn your head to look at something, does your child look around to see what you are looking at?	26. I like having a conversation with several people, for instance around a dinner table, at school or at work. (NOT) 32. It is difficult for me to start and stop a conversation. I need to keep going until I am finished 43. I like to talk things over with my friends. (NOT) 69. I like to be by myself as much as I can. (NOT)	26. I like doing things spontaneously (NOT)
I	2.9. Repeats heard words, parts of words or TV commercials	15. Sometimes a thought or a subject gets stuck in my head, and I have to talk about it even if no one is interested.			2. I often use words and phrases from movies and television in conversations 76. It is difficult to figure out what other people expect of me.	28. I notice patterns in things all the time
I	2.10. Repetitive language (same word or phrase over and over)	17. When I become interested in something, my interest is often intense, strong, and deep.			8. I only like to talk to people who share my special interests	18. People close to me say I talk about the same things repeatedly

S	2.11. Can't sustain conversation		16. Child can be with other children but only on his/her terms 25. Child is bullied by other children		8. Is your child interested in other children? (NOT)	11. I miss my best friends or family when we are apart for a long time. (NOT) 24. I get highly confused when someone interrupts me when I am talking about something I am very interested in. 45. It can be very hard to read someone's face, hand and body movements when they are talking. 56. When I am talking to someone, it is hard to change the subject. If the other person does so, I can get very upset and confused. 64. How to make friends and socialise is a mystery to me. 72. I enjoy spending time eating and talking with my family and friends. (NOT) 77. I like to have close friends. (NOT)	24. I am a good diplomat and can help ease difficult social or work situations (NOT)
I	2.12. Monotonous speech, wrong pausing	11. I have often been told that I have an unusual voice or cadence (e.g., flat, monotone, childish, high-pitched)				33. I speak with a normal rhythm. (NOT) 49. I have been told that I have an unusual voice (for example flat, monotone, childish, or high-pitched). 62. I usually speak in a normal tone	30. I can tell if someone I am talking to is getting bored
I	2.13. Speaks same to kids, adults, objects (can't differentiate)		17.Child lacks best friend		19. If something new happens, does your child look at your face to see how you feel about it?	6. I can't 'put myself in other people's shoes.' 31. I have never wanted or needed to have what other people call an 'intimate relationship.' 47 I feel very comfortable with dating or being in social situations with others.(NOT)	10. I prefer non-fiction books and films to fiction

I	2.14. Uses language inappropriately (wrong words or phrases)		6. Child has deviant communication with a formal, fussy, old-fashioned, or 'robot-like' language 11. Child uses language freely but fails to make adjustment to fit social contexts or the needs of different listeners	11. Verbal communication		7. I have a hard time figuring out what some phrases mean like you are the apple of my eye 66. The phrase, 'He wears his heart on his sleeve,' does not make sense to me. 80. I tend to point out other people's mistakes	
	3. Abnormal Symbolic or Imaginary Play						
M	3.1. Hand or finer flapping; self stimulation	1. Privately or not, I engage in repetitive behaviors (e.g., hand flapping, rocking, pacing, spinning) that help me calm down and/ or self-regulate.				51. I do certain things with my hands over and over again (like flapping, twirling sticks or strings, waving things by my eyes)	
M	3.2. Head banging						
M	3.3. Self mutilation, inflicting pain or injury						
M	3.4. Toe walking, clumsy body posture	4. I am often told that I'm clumsy or uncoordinated.	20. Child has clumsy, ill coordinated, ungainly, awkward movements or gestures 27. Child has markedly unusual posture	4. Body use	4. Does your child like climbing on things? 20. Does your child like movement activities?	16. I have been told that I am clumsy or uncoordinated	
I	3.5. Arranging toys in rows			5. Object use			9. I find numbers, dates and strings of information fascinating
M	3.6. Smelling, banging, licking or other inappropriate use of toys			9. Taste, smell, and touch response and use		29. Some ordinary textures that do not bother others feel very offensive when they touch my skin 34. The same sound, colour or texture can suddenly change from very sensitive to very dull. 46. The same thing (like clothes or temperatures) can feel very different to me at different times. 67. If I am in a place where there are many smells, textures to feel, noises or bright lights, I feel anxious or frightened. 73. I can't tolerate things I dislike (like smells, textures, sounds or colours).	
I	3.7. Interest in toy parts, such as car wheels						

I	3.8. Obsessed with objects or topics (trains, weather, numbers, dates)	18. People often tell me that I give too much detail.		13. Activity level; Thinking/ Cognitive Integration Skills (HF)		78. People tell me that I give too much detail.	3. I find myself becoming strongly absorbed in something – even obsessional
I	3.9. Spinning objects, self, or fascination with spinning objects					65. It calms me to spin around or to rock in a chair when I'm feeling stressed.	
I	3.10. Restricted interest, (watching the same video over and over)					8. I only like to talk to people who share my special interests 70. I keep my thoughts stacked in my memory like they are on filing cards, and I pick out the ones I need by looking through the stack and finding the right one (or another unique way).	29. I have some very strong interests and get upset if I can't pursue them
I	3.11. Difficulty stopping repetitive "boring" activity or conversation		18.Child lacks common sense	6. Adaptation to change		50. Sometimes a thought or a subject gets stuck in my mind and I have to talk about it even if no one is interested 52. I have never been interested in what most of the people I know consider interesting.	27. If I am interrupted doing something I find it hard to get back to what I was doing before hand
M	3.12. Attachment to unusual objects, (sticks, stones, strings, or hair)		24. Child shows idiosyncratic attachment to objects			17. Others consider me odd or different.	16. I like collecting information about things I am interested in
I	3.13. Stubborn about rituals and routines; resists to change		22. Child has difficulties in completing simple daily activities because of compulsory repetition of certain actions or thoughts	14. Level and Consistency of Intellectual Response		30. I get extremely upset when the way I like to do things is suddenly changed. 41. I keep lists of things that interest me, even when they have no practical use (for example sports statistics, train schedules, calendar dates, historical facts and dates). 42. When I feel overwhelmed by my senses, I have to isolate myself to shut them down. 63. I like things to be exactly the same day after day and even small changes in my routines upset me 75. When I go somewhere, I have to follow a familiar route or I can get very confused and upset.	11. I find it upsetting if my daily routine is upset or changed 2. I prefer doing things the same way - for instance my morning routine or trip to the supermarket

M	3.14. Restricted taste by consistency, shape or form (refuses solids)				10. I always notice how food feels in my mouth. This is more important to me than how it tastes	
I	3.15. Savant ability, restricted skill superior to age group (reads early, memorizes books)	3. I notice patterns in things all the time.	1. Child is old-fashioned or precocious 2. Child is regarded as an "eccentric professor" by the other children 4. Child accumulates facts on certain subjects (good rote memory) but does not really understand the meaning 10. Child is surprisingly good at some things and surprisingly poor at others		40. I can see in my mind in exact detail things that I am interested in.	14. I notice very small changes in a person's appearance
	4. Behavioral Difficulties					
	5. Level of Dysfunction					

Appendix 2: Miscellaneous other Indicators Drawn from Experience with these Items Analyzed in Terms of "Me", "I", and "Self"

- Sensitive undersoles of feet   M
- Use of pronouns (you rather than I)   I & S
- Boys quiet   I & S
- Girls chatty   I & S
- Foods on plate separate   I
- White foods only   M
- Not slimy or gooey foods   M
- Prefer crunchy foods   M
- Order for eating foods   I
- Sensitivity to fabrics   M
- Meltdowns   M & I
- Careful, laboured, thorough thinking process I
- Rules (algorithms)   I
- Reactivity to minor changes   M & I
- Changes of fascinations   M & I

Me: 7 (includes 4 I)
I: 10 (includes 3 Me + 3 Self)
Self: 3 (includes 3 I)