# Trauma or Autism? – Understanding how the effects of trauma and disrupted attachment can commonly be mistaken for autism

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## Abstract

**Purpose** - Early bio-psycho-social experiences can dramatically impact all aspects of development. Both autism and traumagenic histories can lead to trans-diagnostic behavioural features that can be confused with one another during diagnostic assessment, unless an in-depth differential diagnostic evaluation is conducted that considers the developmental aetiology and underpinning experiences and triggers to trans-diagnostic behaviours.

**Design** - This paper will explore the ways in which biological, cognitive, emotional, and social sequelae of early trauma and attachment challenges, can look very similar to a range of neurodevelopmental disorders, including autism. Relevant literature and theory will be considered and synthesised with clinical knowledge of trauma and autism.

**Findings** – Recommendations are made for how the overlap between features of autism and trauma can be considered during assessments alongside consideration for interventions to enable people to access the most appropriate support for their needs.

**Originality** – Many features of the behaviours of individuals who have experienced early childhood trauma and disrupted or maladaptive attachments, may look similar to the behaviours associated with autism and hence diagnostic assessments of autism need to carefully differentiate traumagenic causes, in order to either dual diagnose (if both are present) or exclude autism, if it is not present. This has for long been recognised in child and

adolescent autism specialist services but is less well developed in adult autism specialist services.

**Keywords:** Autism; Trauma; PTSD; Complex.

## Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by differences in social communication and social interaction and the presence of stereotyped or repetitive interests or behaviour (American Psychiatric Association [APA], 2013). In contrast, trauma is defined as occurring when an individual is exposed to physical, emotional or psychological harm and/or contradictions to a person's worldview (Horowitz, 1989). As noted by SAMSHA psychological trauma is not limited to diagnostic criteria and is considered by practitioners to be less of a mental disorder but in many cases a part of the normal human survival instinct. However, in extreme cases this can lead to more complex responses to trauma including intrusive memories, re-experiencing, avoidance, heightened threat perceptions, disturbances in self-organisation, emotional dysregulation, a negative self-view, a loss of social resources and disturbances in relationships (ICD-11).

As noted by Haruvi-Lamdan *et al.,* (2017) people with autism may be at an increased risk of exposure to trauma and subsequent PTSD. Thus, it is acknowledged that comorbidity exists between autism and PTSD. However, it is also noted that autism and trauma may exist separately. This paper will explore the ways in which practitioners may experience challenges in differentiating an autistic profile from traumatic and attachment sequelae. This can apply when assessing children and adults for autism and can generate a risk of a 'false positive' diagnosis of autism which has also been noted in other conditions where a person is being assessed for autism (Maddox *et al.*, 2017) using tools such as the ADOS-2 (Grzadzinksi *et al.*, 2016; de Bildt *et al.*, 2016).

The problem of 'false positive' diagnoses of autism have been noted in children (Duvall *et al.*, 2022) due to the level of clinical judgement and experience necessary for the tester to accurately map observed behaviours to underlying autistic disturbances (Fombonne, 2023) even when tools such as the ADOS are used because many atypical behaviours that are linked

to autism are not specific to autism alone (Fombonne, 2023). For example, in their study, Greene *et al.,* (2022) found that trauma-related disorders (i.e. PTSD and other trauma/stressor-related disorders) were the only diagnoses that were more frequent in the false positive group relative to the true positive group in assessments of autism using the ADOS-2. Whilst during childhood, autism assessments can come to include a range of objective observations, carer accounts, school accounts and an opportunity to test developmental plasticity in children with trauma whose development can be rediverted through therapy and support, diagnostic assessments of adults are more challenging and could be susceptible to false positives due to the challenge of differential diagnosis being greater in adult patients (Fombonne, 2023). However, there are currently promising outcomes for trauma-focused therapy for adults both in terms of reducing psychological symptoms and imaging studies showing change in brain activation before/after therapy in adults with PTSD (Santarnecchi *et al.,* 2019). Therefore differentiating autism and trauma has important treatment implications.

Adult autism assessments relying on limited accounts of childhood history, which may be from the adult patient themselves without an opportunity to corroborate accuracy/objectivity, become wholly reliant on the patient's insight, and retrospective analysis of their past and present. Whilst in many cases, this can make for an easier diagnostic interview and offer a longer and more longitudinal history with a wider range of tests of autistic functioning to draw diagnostic inferences from, in other cases, the assessment may be impacted by far more diagnostic 'red herrings' (Havdahl *et al.*, 2016). Further adding to this dilemma is the fact that autism can be subtle and masked (Pearson and Rose, 2021) and significant diversity exists among individuals with autism in terms of their presenting features (Murphy and Broyd, 2023) thus, further creating a challenge for its diagnostic exclusion. Other traumagenic developmental features may be equally broad and subtle and can be difficult to distinguish with certainty.

As a result, many patients may think that their experience may match autism descriptions and use autism language to describe their history to clinicians, filtering their past non autistic experiences through an autism lens as a means of adaptative coping and in an attempt to process their adversarial circumstances (Murphy and Broyd, 2023) and derive positive meaning from them. In turn, clinicians may also find it harder to distinguish such descriptions

from traumatic sequelae. This can lead to a range of decision-making anomalies and biases during diagnosis, including clinicians veering in favour of the least stigmatised label, veering towards the area of expertise and greater confidence, or a hesitance to assign any diagnostic label. Whilst understandable, this can have both clinical and ethical costs in diluting diagnostic integrity and misdirecting subsequent support, management and treatment.

The time pressures operating on diagnosticians limit their capacity to undertake extensive differential diagnostic enquiries when faced with diagnostic uncertainty or gaps in information (e.g. no informant or limited insight/memory, or inconsistent evidence). In order to assist diagnosticians to consider differential diagnostic hypotheses when faced with patients who present for an autism assessment but whom they may suspect have traumagenic explanations for their presentation, the following guidance was produced. This presents examples of the different ways that adverse attachment experiences, trauma, and personality related challenges can mimic autism and lead to a false positive diagnosis of autism in patients who are neurotypical (at birth). The examples are organised along the features of autism that may be mimicked by traumagenic development. For each feature, a brief summary is given of how traumagenic sequelae can better explain the outward behaviour or reported experience that may initially seem autistic but is in fact not. Of course some patients will have both autism and traumagenic development, whilst others may have only autism, and yet others may only have traumatic development and no autism (Cox *et al.*, 2019). It is for the diagnostician to skilfully differentiate these profiles by examining their roots (both historically and experientially), in order to generate a reliable diagnosis that can signpost to the appropriate support and insight. Autism and traumagenic development both have broad trans-diagnostic markers that are often hard to distinguish at the behavioural level, without examining their history and what triggers them, and hence it is important to incorporate such analysis into diagnostic assessments, as both DSM and ICD autism classifications are predicated on the exclusion of alternative explanations and differentiated classifications (Cox *et al.*, 2019).

The authors acknowledge that people with autism may be at an increased risk of comorbid diagnoses of complex trauma due to a number of pathways such as increased vulnerability to traumatic exposure (Haruvi-Lamdan *et al.*, 2018), reduced social networks which act as protective factors when exposed to trauma (Estell *et al.*, 2009) and the potential for genetic

overlap between autism and PTSD (Haruvi-Lamdan *et al.*, 2018; Warrier and Baron-Cohen, 2019). The difficulties and disadvantages of diagnostic labelling of clients are also noted (Cox *et al.*, 2019) and differentiating autism from complex trauma is important in order to provide the most effective and person-centred plan to support the person (Johnstone and Dallos, 2013). Whilst tools such as the Coventry Grid for Adults have been developed (Cox *et al.*, 2019) there has yet to be an opportunity to validate such tools. Furthermore, the literature and mechanisms by which symptoms of trauma and autism are not clearly identified in the tool which was also developed prior to the more recent criteria for autism in ICD-11. Therefore this paper summarises the literature in relation to adult symptom overlap in autism and trauma with a view to assisting clinicians to consider differential diagnoses when undertaking diagnostic assessments.

## Features of Autism that Can be Mimicked by Traumagenic Development

Disrupted attachments and childhood interpersonal trauma can inevitably shape social cognition, social emotions, social behaviour, and all aspects of socio-affective and interpersonal functioning (Cox *et al.*, 2019). Adverse Childhood Experiences (ACE's) affect these aspects of normal development across the developmental stages and the normal development that an individual is born with a capacity for is disrupted and reshaped. This can have bio-psycho-social levels to it and is not simply a cognitive developmental disruption. For example the Neurosequential Model of Therapeutics (NMT) notes how early adversity and trauma impacts upon brain development in terms of sensory integration, self-regulation, relational and cognitive functioning (Perry, 2019). Hence early attachment and traumagenic experiences can reshape all aspects of development from childhood to adulthood. By the time the individual reaches adulthood, their physiological, emotional, (neuro)cognitive and behavioural functioning may resemble a range of other psychiatric, behavioural and neurodevelopmental conditions and unless the origin of such development is known, it can easily be attributed to these other conditions. One such falsely assigned condition is autism. Both clinician and patient may benefit from the knowledge that most if not all autistic indicators that are addressed in standard autism assessments may be mimicked by traumagenic development and when both are possibilities, careful differentiation is a critical aspect of the diagnostic assessment and key basis for the conclusion. An autism assessment

can for example, consider how each autistic feature can be mimicked by traumagenic development, in the following ways:

**Social communication and interaction styles**

Social withdrawal, preference for solitude, flattened or reduced expressivity of emotions/internal experiences/needs and reduced communication, can all arise from childhood trauma and may characterise some children from an early age, and become second nature by the time the child grows into an adult. For example, Vasquez and Miller (2018) noted that a diagnosis of attachment disorder is characterized by severely disturbed and developmentally inappropriate social interactions which can also include social withdrawal and poor socialisation with peers (Vorria *et al.*, 1998). These presentations are effectively the best means to minimise threat for a child whose introduction to relationships and communication is a harmful one, where others may punish their proximity/overtures, communication, or interactions.

They may also learn that social communication and interaction lead to danger by observing others being punished for them (e.g. witnessing physical abuse when an abused parent interacts or communicates with an abusive one). At the very least they may simply not learn to instigate such behaviours as a result of an absence of healthy modelling by adults, in cases where carers are absent, neglectful or may not possess the relevant skills to socially communicate and interact in healthy, sophisticated ways. When basic help-seeking behaviours by the child prove ineffective, this can lead to the child developing an Internal Working Model (IWM) that seeking out others as a source of comfort, resources, or safety, is ineffectual (Vasquez and Miller, 2018). The child may maintain some neurotypical 'social curiosity' but when others are experienced as a source of danger, this can be diverted to a social hypervigilance, where their curiosity comes to serve as a means of looking for threat cues and defending against them (Vorria *et al.*, 1998). This can in turn diminish their healthy forms of social curiosity and they may retreat into solitude and minimal social communication and interaction. For example, childhood trauma has been associated with disrupted attachment development, and difficulties in mentalizing, social imagination and responsivity to others' social cues (Luyten *et al.*, 2019).

Social overtures may also be limited or may be enacted in socially atypical ways due to a lack of learning or maladaptive learning. Where social overtures and interactions are developed, the child and later adult may opt for 'safe' topics such as factual topics instead of socially and emotionally complex topics that may trigger others. Overall, a child may learn that the safest means to survive is to seek a sense of power and control over themselves and their environment (McConnico *et al.*, 2016) by adopting an over-controlled, inhibited, or restricted social communication and interaction style and maintaining this rigidly, as openness to new and flexible experience can bring potential danger. They may also come to associate the absence of social connection/emotional intimacy with safety and become aloof/ disconnected from others as well as misperceiving the intentions and cues of others (Cook *et al.*, 2003). Therefore, a traumatised child's perception and processing of others and their reactions and social behaviours, may all take on psychopathological forms as a result of developmental trauma and neglect. The result may include impaired reciprocity and ability to share, difficulties initiating/sustaining interactions, blunted or atypical communication, difficulty processing and connecting with others and a preference for solitude, either as stable tendencies or else at times of heightened arousal.

As well as leading to inhibited social behaviours, disrupted attachments and inappropriate carer attachment behaviours can lead to the development of the opposite social responses in a child, namely to disinhibited and dysregulated social behaviours that can look like autism and other often co-morbid neurodevelopmental conditions. These can include excessive or inappropriate social overtures, with indiscriminate closeness seeking from strangers and significant others alike. For example, research shows that children with social/disinhibited reactive attachment disorders display a lack of selectivity in choice to attachment figures including showing a lack or complete absence of reticence toward strangers (Gleason *et al.*, 2011). This can mimic the social naivety and lack of discernment of social rules that is associated with autism. Seeking social warmth or care from others through attention-seeking, impulsive or destructive behaviours and emotional dysregulation has also been found in children with trauma (Zeanah *et al.*, 2015) and this can include inattentiveness, restlessness, and hyperactivity (Juffer and Series, 2008), which can mimic symptoms of Attention Deficit Hyperactivity Disorder.

A child exposed to unsafe or inconsistent attachments may find people unpredictable due to this being the reality in their childhood and as they get older, they may pre-emptively worry about and become pre-occupied with others' unpredictability, with unfamiliar people and social spaces triggering a stress response (including a physiological response and cognitive overwhelm as they seek to intellectually/cognitively predict the risk of harm). People and new relationships may therefore seem intuitively difficult to predict, are avoided or else constantly analysed. This is known as clinging and distancing (Masterson, 1976). The individual may also adopt behavioural scripts to ensure they don't bring harm to others and they may prepare how to behave, as a way of imposing the only control and predictability they can affect themselves in an otherwise unpredictable social world.

A key feature of autism in ICD-11 relates to difficulties with social communication (including eye contact), social awareness and imagining and responding to the feelings, emotional states and attitudes of others. Historically this has been referred to as deficits in Theory of Mind (ToM) whereby people with autism were considered to have difficulties understanding and inferring the mental state of others (Baron-Cohen et al, 1999). However more recent approaches to understanding empathy suggest that individual differences may contribute to the differences in the accuracy of mental state inferences. For example, Milton et al., (2022) propose that it is not a case of autistic people lacking empathy but instead experiencing the world differently from neurotypical people resulting in two people making different inferences and both having a lack of understanding of one another as a result. This is referred to as the Double Empathy Problem whereby both sides are not empathising with the other because of individual differences.

This has been captured in the 'Mind-Space' Framework (Conway et al, 2019) which takes into account how individual differences influence multiple representations of others including understanding atypical social cognition. This can include factors such as autism but also experience-dependent factors and atypical experiences including psychiatric conditions (Conway et al, 2019) whereby mind-space experiences cause misunderstandings or breakdowns in social cognition. One example of this includes factors such as traumagenic development whereby the individual may be too overwhelmed and hypervigilant to process information during interactions that feel threatening and may avoid eye contact with or sustained looking at others to avoid others they feel unsafe around (TeBockhorst *et al.*, 2014).

As a result they may miss/misinterpret social cues. For example, research has found that people exposed to complex trauma (CT) have an increased vulnerability to stress and cortisol secretion which moderated Theory of Mind (ToM) skills in terms of understanding false beliefs and the intentions of others (Lee *et al.*, 2022). This has been associated with poor skills at interpreting the emotions of others through facial expressions in children with a history of trauma exposure (Franke, 2014) whereby they may perceive others as hostile or angry even when their face was neutral.

In addition, threat can narrow the information processing field and bigger social contexts may be overlooked. This can mirror atypical attention seen in some autistic individuals who may exhibit attentional narrowing particularly during social contexts (Hochhauser et al, 2021). However, in individuals with trauma this is born out of a situational fear response inhibiting their cognitive processing as opposed to organic (autistic) social cue processing impairment. They may further struggle to read others from implicit non-verbal cues due to their maladaptive or limited learning about human behaviour from carers and they may not be able to read others' intentionality or else may misattribute others' behaviours to negative intent as a result of experiencing negative or harmful early attachments (Nietlisbach and Maercker, 2009). As the sense of threat during interactions is heightened, the individual may seek to predict threat by processing factual details and explicit concrete information about others, if they are unable to read their implicit communication cues. This can mimic autistic preference for 'systemising' and impaired 'empathising'. Furthermore, empathising (or the ability to intuitively read people) in neurotypical children can develop from adaptive communication and feedback from carers about others' needs and validation and labelling of the child's own needs, and an absence of such learning can lead to impaired empathising at all times, and not just during threat, which can mimic the global empathising difficulties associated with autism. This may have implications for the reduced validity of screening tools measuring systemising-empathising for differentiating autism from trauma.

Disrupted attachment can lead to a failure to learn social rules, as well as disrupted development of adaptive skills to read social situations, non-verbal or implicit cues and intentionality in others. Disrupted social development can in turn lead to adverse reactions from others (e.g. at school and in the home) (McConnico *et al.*, 2016) creating a self-

perpetuating cycle of maladaptive social communication and interaction development. Interactions become increasingly challenging and anxiety-provoking and opportunities to learn and adapt from healthy social experiences diminish, leading to increasing social communication and interaction difficulties. Inversely, some children begin to learn more adaptive social behaviours as they meet more people outside their traumagenic home environment and may develop their potential neurotypical skills, but this delayed neurotypical development may be mistaken for compensation of autism.

Overall, trauma and disrupted attachments can give rise to significant impairments in social communication and interaction. Even in individuals who eventually (re)learn more adaptive social behaviours, any residual heightened states of arousal and the need to overthink how to navigate them safety, during social interactions, can cause social and physical fatigue. All of the aforementioned features and their fatiguing effects can resemble social communication and interaction features of autism.

**Pre-occupations, Obsessionality, restricted focus and repetitive behaviour**

Interpersonal insecurity, relational uncertainty and social distress arising from traumatic or disrupted childhood attachments can give rise to a pre-occupation and cognitive hyperfocus, with others or one's own experiences. Maladaptive attachment and lack of safety can lead to intense obsessional relationships or social pre-occupations (e.g. obsessional attachment to parent or peer, or pre-occupation with own or other's behaviour that leads to rejection). An individual with high global intelligence can resort to over-analysis of people and their behaviours, as a means to ensure safety and care. This can collectively lead to repetitive, fixated pre-occupations and social anxiety, both of which may be commonly associated with autism.

Some children with traumagenic histories may retreat into their inner world and mental rehearsals leading to repetitive fantasies and daydreaming (Somer *et al.*, 2020). In some,

these may be acted out in play and such play may be repetitive and stereotypical movements (Schimmenti *et al.*, 2019) due to its anxiety-soothing function as well as solitary, due to others feeling unsafe and retreat into one's own mind feeling safer. This can often be mistaken for autistic fantasy and play.

Trauma essentially entails intense and distressing experiences of loss of control. Not surprisingly, coping strategies to restore control often develop, as a means of restoring safety and avoiding (subjective and objective) threat and danger. For example, research shows that exposure to multiple childhood traumatic events increases the risk of developing behaviours related to obsessive compulsive disorder in adulthood compared to individuals who had experienced a single childhood traumatic event (Park *et al.*., 2014). Restrictive or excessive behaviours relating to eating, playing, motor behaviours or object use, can all serve to sooth and afford control during childhood. Miller and Brock (2017) found that childhood trauma was specifically related to compulsions (are associated with repeated behaviours which the person feels compelled to undertake to avert something 'bad' from happening) and serve as a means of control. Hence, the repetitive behaviours as a result of childhood trauma are associated with environmental unpredictability and act as a means to reduce anxiety (Palanza and Parmigiani, 2017). Therefore, rituals, which are a core component of OCD, may be performed to achieve 'pre-existing order' and reduce anxiety as a result of environmental unpredictability (Tonna *et al.*, 2019). Deprivation can also lead to attachment to objects and hoarding behaviours. As the individual gets older, more interpersonal controlling, excessive, restrictive or repetitive behaviours may emerge as the individual gets older and has to navigate and cope with more social and emotional than physical threats. Emotional abuse, physical abuse/neglect, sexual abuse, emotional neglect/abuse have all been positively associated with greater severity of obsessions (Carpenter and Chung, 2011; Kart and Türkçapar, 2019). These types of abuse have been associated with hoarding, checking, cleaning, sexual and religious obsessions (Kart and Türkçapar, 2019; Rukiye and Erbay, 2018). Excessive, repetitive attachment, sexual or emotional behaviours may develop, as well as a range of addictive self-soothing behaviours. Trauma can also impair self-regulation and hence both threat-alleviating as well as reward-seeking behaviours may become excessive,

repetitive, and restricted leading to an increase in ritualistic compulsions (Rukiye and Erbay, 2018).

Restricted social behaviours (e.g. a narrow range of social behaviours and use of social language) may also develop partly due to impoverished carer/adult modelling of a healthy range of behaviours and partly due to fear of unknown/unsafe consequences of trying new behaviours. In extreme cases, a child may appear mute or to have developmental delay in social communication (von Knorring and Hultcranz, 2020).

**Heightened need for routines, structure, predictability and aversion to change**

Trauma and disorganised attachments can generate a heightened need for routine, repetition and sameness and an over-sensitivity and distress at the prospect of unpredictability in people and the environment. This can create anxiety about change and a heightened need for familiarity and sameness may be seen in some children and adults with traumatic histories. This can lead to a preference for or even insistence on the child and parent/carer being in the same place, playing with the same toys, sticking to daily routines or always having objects of attachment and safety. All these behaviours may be mistaken for autistic need for routine and sameness and rigid attachment to familiar objects. Furthermore, safety may be derived in knowing and sticking to details in a pedantic way, following trauma and unpredictable attachment experiences (Mikulincer and Shaver, 2007), and this may mimic autistic rigidity, literalism, pedantry and focus on local detail. For example, Vasquez and Miller (2018) found that in their sample people who had experienced trauma were prone to perfectionism and where this could not be achieved it was associated with high levels of distress and a need to order. In this study people with autism were excluded from participation.

**Sensory sensitivity**

Trauma can lead to hypervigilance that operates across a broad range of neurophysiological and neurosensory levels. As noted by Joseph *et al.,* (2021) sensory modulation occurs when the central nervous system (CNS) balances both excitatory and inhibitory inputs that arise

both internally within the sensory systems, as well externally in the environment (Atchison, 2007). This can result in behaviours such as sensory seeking and sensory avoiding (Brown *et al.*, 2019). When a person cannot modulate their sensory system this may be displayed through impulsiveness, distractibility, increased activity, disorganization, anxiety, poor self-regulation (Ayres 1972; Cohn *et al.*. 2000) and aggression (May-Benson and Koomar, 2010). Sensory modulation disorder is prevalent in 5–16% of typically developing children (Gouze *et al.*. 2009) however, children exposed to trauma have been found to have an increased risk of sensory modulation difficulties due to neuroanatomical changes in the sensory cortex affecting visual and auditory cortices and the limbic system (Stein *et al.*. 1997). This sensory sensitivity can be mistaken for autism related sensory differences. For example feeling anxious and overwhelmed by certain sensory stimuli that are traumagenic may be mistaken for autistic sensory hyper-sensitivity. Inversely, seeking sensory experiences to sooth/regulate or seeking sensory stimulation due to an inability to detect and regulate internal physiological experiences (as adult carers have not coregulated and taught self-regulation) are all possible sequelae of trauma. These may be mistaken for autistic hypo-sensitivity, sensory regulation (modulation and discrimination) difficulties and stimming. In addition research shows that children who have been victims of neglect or exposed to trauma which has left them in a state of flight, fight or fright with high or low arousal for a period of time, may either misinterpret or underreact to important sensory information (Howard *et al.*. 2020). In addition trauma has also been associated with sensory avoidance, hypo-arousal, hyperarousal, anxiety, being tactile defensive, auditory defensive, having an aversion to movement or gravitational insecurity (Alers 2008). They may also have reduced responsivity to pain stimuli (Hood and Badour, 2020).

Inversely, sensory seeking behaviours may arise from conditioning (associations) between safety and sensory input (e.g. child learning that they can only be safe when being held, or feeling temporarily comforted by sensory input during adverse experiences). They may repeatedly seek tactile or other sensory input, for comfort, especially at times of distress (Cermak & Groza, 1998). They may also learn to use motor and sensory behaviour to attract a distant/emotionally absent caregiver's attention. Furthermore, desensitisation to pain and distress during adverse life experiences that give rise to intense danger and sensory/emotional shut-down defences, can look like high threshold for pain, lack of

emotional/body cues and alexithymia in autism. Alexithymia can of course be present in individuals with traumagenic histories who may have not developed adaptive safe experiences of emotions nor adaptive language and communication of inner states (e.g. emotional language/vocabulary) (Dinc *et al.*, 2021). Therefore, traumatic experience can lead to both outcomes that mimic and overlap with autism, albeit arising from a different developmental trajectory.

Trauma can lead to sensory as well as emotional/cognitive shut and dissociative states where responsiveness to the environment is reduced. This can be mistaken for autistic shut-downs. For example, Vasquez and Miller (2018) noted in their study of children exposed to trauma that they would hide from adults and appear to be in their own world (Vasquez and Miller, 2018). In addition, many with severe histories of trauma can develop a 'freeze' response that can resemble autistic catatonia or autistic shut downs. Overall, traumagenic shut downs/meltdowns (Grant, 2019), sensory and emotional flatness, and processing difficulties (especially when they arise in or following exposure to social spaces/interactions) can also mimic autistic features. In some instances, the opposite fight-or-flight responses can arise from trauma, i.e. fight responses, and these may be mistaken for autistic melt-downs when they arise in social or sensory spaces. Children exposed to prolonged trauma have been noted to engage in extreme 'meltdowns', rage and aggression which it is noted is caused by difficulties adapting to environmental demands (Vasquez and Miller, 2017; Rukiye and Erbay, 2018) This can lead to 'meltdowns', self-harming or aggression, as well as impair social and occupational functioning.

Finally, under-reporting of physical and bodily needs to carers can arise from unsafe or neglectful care-giving, as the child either learns to suppress their needs and avoid communicating them or else fails to develop awareness and the ability to detect or communicate their needs due to adults not attending to or regulating their needs. This under-reporting of bodily and physical needs (need to eat, need to go to the toilet experience of pain or temperature) can be mistaken for interoceptive, pain and temperature hypo-sensitivity or lack of sensory discrimination arising from autism. For example, Durmaz *et al.,* (2017) found increased risk of enuresis in children with a history of trauma. Inversely, a child may feel and express extreme distress when experiencing physical sensations and not learn how to regulate or communicate their needs adaptively due to neglect or aversive reactions

to their needs from carers. This can lead to extreme stress response or externalising behaviour when experiencing physical needs, which is then mistaken for sensory hyper-sensitivity and impaired sensory modulation arising from autism. For example, in their study Strodl and Wylie (2020) found a significant direct association between childhood emotional abuse and cognitive restraint for eating (restricting food), in addition to childhood sexual abuse and emotional eating (eating when not physiologically hungry but in response to emotions). These could be mistaken for food selectivity or 'picky eating' (Baraskewich *et al.*, 2021) or excessive eating in people with autism (Vissoker *et al.*, 2019).

**Neurocognitive Styles**

Neurocognitive styles associated with autism, though not diagnostic, may be important to consider during diagnosis as they not only underpin some diagnostic features of autism but also assist to differentiate autism from other conditions that look similar at the behavioural level. However, traumagenic experiences in early childhood may give rise to neurocognitive styles and processes that can mimic those associated with autism such as rumination and cognitive rigidity (Haruvi-Lamdan *et al.,* 2017). Examples are provided to illustrate this point.

Theory of Mind impairments are often associated with autism but are not exclusively autistic neurocognitive features. Disrupted emotional and psychosocial development arising from trauma can lead to impaired theory of mind at both a behavioural and neurobiological level (Luten *et al.*, 2019), either temporarily or in some permanently. The ability to mentalise (introspect into one's own experience and to guess what others may be thinking) develop through nature and nurture and when a child's own mental states are not recognised, labelled and responded to, they may not develop the aptitude to do this themselves, in relation to themselves and others. This disruption in neurocognitive development is secondary to trauma and attachment processes rather than ASD (Serafini *et al.*, 2014) but the two may be difficult to distinguish, at face value.

Disrupted attachments and maladaptive social modelling can lead to a learnt lack of flexibility in behaviour whereby the insecurely attached individual has a strong tendency to hold on to attachment templates even when it is not confirmed by others (Luyten, 2009). In addition, this can impact on mentalising and theory of mind abilities in people with a history of trauma because of the way in which developmental trauma can impact frontal executive

development (Fonagy and Luyten, 2009). This can give rise to cognitive and behavioural rigidity, concreteness and narrow focus that are trait like. Such traits can become accentuated during states of threat or fight-or-flight (which is often a frequent experience in those with traumatic history), as the amygdala takes over and frontal executive control diminishes, leading to cognitive and behavioural rigidity, more concrete reasoning / perseverance, and a narrowed focus on immediate detail (of threat). For example, studies have found trauma to be associated with various aspects of rumination (e.g., Michael *et al.*, 2007), amygdala hyper-reactivity to emotional stimuli (Teicher and Samson, 2016) and alterations in the functional connectivity of the amygdala and prefrontal cortex (Grant *et al.*, 2011; Mazefsky *et al*., 2013). Such cognitive traits and states can often look like autistic rigidity, perseverance, and frontal executive challenges but when trauma induced may respond more positively to approaches such as NMT. Whilst research exists which establishes fMRI differences between neurotypical adults and adults with autism (Zhang *et al.,* 2020) this has not extended to compare adults with autism in comparison to those with trauma. In addition, the practicality of assessors being able to access such screening is also questionable. As such differentiating autism from traumagenic responses is heavily reliant on the knowledge and skills of the practitioner. Ways in which they could be supported with this are made subsequently.

## Summary and Conclusions

Both autism and traumagenic histories can lead to trans-diagnostic behavioural features that can be confused with one another during diagnostic assessment, unless an in-depth differential diagnostic evaluation is conducted that considers the developmental aetiology and underpinning experiences and triggers to such behaviours at the present time. Many features of the behaviours of individuals who have experienced early childhood trauma and disrupted or maladaptive attachments, may look similar to the behaviours associated with autism and hence diagnostic assessments of autism need to carefully differentiate traumagenic causes, in order to either dual diagnose (if both are present) or exclude autism, if it is not present. This has for long been recognised in child and adolescent autism specialist services but is less well developed in adult autism specialist services. The diagnostic assessment itself may differ across the ages and different profiles may lend themselves to greater or lesser differential clarity. It is important that adequate resources and expertise are

provided to adult autism diagnosticians, as they conduct a highly complex and intricate differential diagnostic assessment that needs to have both sensitivity to each of autism and trauma and the specificity to reliably detect each condition and discriminate from the other. Historically, clinicians anecdotally reported and research showed false negative diagnoses of autism, where autism was missed or misdiagnosed. Over recent years, the encouraging increase in awareness and social acceptability and celebration of neurodiversity, have led many to access online and offline information on autism. Many of the behaviours associated with autism are similar to those arising from traumatic histories and it is inevitable that some individuals with the latter may interpret their experiences as indicators of autism and seek an autism assessment. In order to do justice to the needs and experiences of those individuals, diagnosticians need to guard for both positive negatives and positives alike, to provide the most accurate formulation possible, whether this ends up in an autism diagnosis or conclusion of traumagenic developmental sequelae. The latter are often labelled as attachment disorder in childhood or complex PTSD and personality disorders in adulthood and clinicians need to identify such profiles of needs and distinguish them from autism, where possible using compassionate language that is sensitive to stigma (e.g. personality functioning, attachment styles, traumagenic sequelae). In either scenario, an accurate and nuanced formulation can best serve the interest of the patient as well as maintain the integrity and fidelity of diagnostic constructs.

The current guidance is a small step towards affording often over-stretched diagnosticians a summary they can use to guide their differential diagnostic thinking and formulations. It focusses solely on how traumagenic sequelae can mimic autism as this is felt to be the least well published area of knowledge and guidance in adult autism services at present. The guidance can be used to elicit and interpret childhood history and adult functioning, when carrying out diagnostic assessments of autism in adults who have a history of trauma and disrupted attachments. It is of utmost importance that a detailed developmental history is obtained and where this is felt to be unachievable, extensive granular assessment of adult functioning and collation of observations and as many informant insights as possible, are central to diagnostic reliability. Finally, it is important that any decisions made by clinicians, including those informed by the information in the current papers, are communicated clearly with patients and the rationale for their diagnosis or non-diagnosis is well articulated, in order

to empower patients to gain self-knowledge, sense of efficacy, and hopefully resolution of their challenges and improved quality of life.

**Implications and Recommendations for Practice**

1. An in-depth differential diagnostic evaluation should be conducted in line with NICE Guidance that considers the developmental trajectory and underpinning experiences and triggers to trans-diagnostic behaviours.
2. When undertaking assessments for autism all other possible explanations of behaviour should be considered, including those linked to a trauma history.
3. Diagnostic assessments of autism need to carefully differentiate traumagenic causes, in order to either dual diagnose (if both are present) or exclude autism, if it is not present. These should be undertaken by clinicians who are trained in the diagnosis of mental illness, personality and neurodiversity and not by individuals who are solely trained in one area of diagnostic speciality (e.g. autism). This is so that diagnosticians can understand the potential overlaps in behaviours and mitigate the risks of false positive and false negative diagnoses.
4. Adequate resources and expertise should be provided to adult autism diagnosticians, as they conduct a highly complex and intricate differential diagnostic assessment that has both sensitivity to each of autism and trauma, the complexity to detect their interaction, and the discriminative acuity to tell them apart. This could include: diagnosticians being assigned more time to conduct assessments; ensuring historical records from medical and non-medical professionals can be accessed; focussing some of the historic interview on the sequelae of traumatic events and not just their occurrence.
5. All assessments of autism should adopt a person-centred, trauma-informed and culturally sensitive approach to the assessment. This can make the elicitation of disclosures of trauma histories more sensitive whilst remaining responsive to possible autism features.
6. A detailed developmental history should be obtained and where this is felt to be unachievable, extensive granular assessment of adult functioning and collation of observations and as many informant insights as possible, are central to diagnostic reliability. The assessment process should compile a holistic view of the patient that is

inclusive of strengths rather than adopting a sole focus upon deficits. This can generate information on neurotypical strengths and abilities as well as autistic ones, and help distinguish autism from trauma.

7. Any decisions made by clinicians, including those informed by the information in the current papers, are communicated clearly with patients and the rationale for any diagnosis or non-diagnosis needs to be well articulated, in order to empower the patient to gain self-knowledge, strengthen their sense of efficacy, autonomy and mastery and hopefully feel closer to finding resolution of their challenges and ways to improve their quality of life and thrive.
8. Where it is determined that trauma may pose a more suited explanation for a patient's presentation, they may be supported to access Trauma Informed Care (TIC) (LeBel and Champagne, 2010) and the Neurosequential Model of Therapeutics (NMT). For example, this may still include sensory modulation approaches as part of multidisciplinary programmes. As noted by Warner *et al.* (2009) the neurological, behavioural, and relational dysregulation seen in victims of trauma requires a combination of professional expertise to ensure the treatment plan is holistic (Da Silva, 2011).
9. Future research could seek to establish validated tools which would support diagnosticians to better differentiate symptoms of autism from trauma.

**References**

Alers, V. 2008. A comparison of the Neuro-physiological aspects of trauma and sensory integration concepts. *SAISI Newletter, 18(3), 17–18.*

Ayres, A.J., 1972. Sensory integration and learning disorders. *Western Psychological Services*.

Baraskewich, J., von Ranson, K.M., McCrimmon, A. and McMorris, C.A., 2021. Feeding and eating problems in children and adolescents with autism: A scoping review. *Autism*, *25*(6), pp.1505-1519.

Carpenter, L. and Chung, M.C., 2011. Childhood trauma in obsessive compulsive disorder: The roles of alexithymia and attachment. *Psychology and Psychotherapy: Theory, Research and Practice*, *84*(4), pp.367-388.

Carthy, E. and Murphy, D., 2021. Comorbid autism spectrum disorder and antisocial personality disorder in forensic settings. *The journal of the American Academy of Psychiatry and the Law*, *49*(4), pp.462-469.

Cohn, E., Miller, L.J. and Tickle-Degnen, L., 2000. Parental hopes for therapy outcomes: Children with sensory modulation disorders. *The American Journal of Occupational Therapy*, *54*(1), pp.36-43.

Cox, C., Bulluss, E., Chapman, F., Cookson, A., Flood, A. and Sharp, A., 2019. The Coventry Grid for adults: a tool to guide clinicians in differentiating complex trauma and autism. *Good Autism Practice*, *20*(1).

de Bildt, A., Sytema, S., Meffert, H. and Bastiaansen, J.A., 2016. The Autism Diagnostic Observation Schedule, Module 4: Application of the revised algorithms in an independent, well-defined, Dutch sample (n= 93). *Journal of Autism and Developmental Disorders*, *46*, pp.21-30.

Da Silva, K., 2011. The Sensory Treatment Approach in Dealing with Trauma in Children: Does it Work? Social Work Theses. 76.

Durmaz, O., Kemer, S., Mutluer, T. and Bütün, E., 2017. Psychiatric dimensions in mothers of children with primary nocturnal enuresis: A controlled study. *Journal of pediatric urology*, *13*(1), pp.62-e1.

Duvall, S., Greene, R., Phelps, R., Markwardt, S., Rutter, T., Grieser Painter, J., ... & Fair, D. (2022). Factors associated with unconfirmed/inaccurate community-based ASD diagnosis in a research referred sample. In International Society for Autism Research Annual Meeting. Austin, TX, USA.

Egner, J., 2022. # ActuallyAutistic: Using Twitter to Construct Individual and Collective Identity Narratives. *Studies in Social Justice*, *16*(2), pp.349-369.

Estell, D.B., Farmer, T.W., Irvin, M.J., Crowther, A., Akos, P. and Boudah, D.J., 2009. Students with exceptionalities and the peer group context of bullying and victimization in late elementary school. *Journal of Child and Family Studies*, *18*, pp.136-150.

Fombonne, E., 2023. Is autism overdiagnosed?. *Journal of Child Psychology and Psychiatry*, *64*(5), pp.711-714.

Fombonne, E., Green Snyder, L., Daniels, A., Feliciano, P. and Chung, W., 2020. Psychiatric and medical profiles of autistic adults in the SPARK cohort. *Journal of autism and developmental disorders*, *50*, pp.3679-3698.

Fonagy, P. and Luyten, P., 2009. A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Development and psychopathology*, *21*(4), pp.1355-1381.

Franke, H.A., 2014. Toxic stress: effects, prevention and treatment. *Children*, *1*(3), pp.390-402.

Gleason, M.M., Fox, N.A., Drury, S., Smyke, A., Egger, H.L., Nelson III, C.A., Gregas, M.C. and Zeanah, C.H., 2011. Validity of evidence-derived criteria for reactive attachment disorder: Indiscriminately social/disinhibited and emotionally withdrawn/inhibited types. *Journal of the American academy of child & adolescent psychiatry*, *50*(3), pp.216-231.

Gouze, K. R., Hopkins, J., Lebailly, S. A., & Lavigne, J. V., 2009. Re-examining the epidemiology of sensory regulation dysfunction and comorbid psychopathology. *Journal of Abnormal Child Psychology, 37(8), 1077–1087.*

Grant, M.M., Cannistraci, C., Hollon, S.D., Gore, J. and Shelton, R., 2011. Childhood trauma history differentiates amygdala response to sad faces within MDD. *Journal of psychiatric research*, *45*(7), pp.886-895.

Greene, R.K., Vasile, I., Bradbury, K.R., Olsen, A. and Duvall, S.W., 2022. Autism Diagnostic Observation Schedule (ADOS-2) elevations in a clinical sample of children and adolescents who do not have autism: Phenotypic profiles of false positives. *The Clinical Neuropsychologist*, *36*(5), pp.943-959.

Grzadzinski, R., Dick, C., Lord, C. and Bishop, S., 2016. Parent-reported and clinician-observed autism spectrum disorder (ASD) symptoms in children with attention deficit/hyperactivity disorder (ADHD): implications for practice under DSM-5. *Molecular autism*, *7*(1), pp.1-12.

Haruvi-Lamdan, N., Horesh, D. and Golan, O., 2018. PTSD and autism spectrum disorder: Co-morbidity, gaps in research, and potential shared mechanisms. *Psychological trauma: theory, research, practice, and policy*, *10*(3), p.290.

Havdahl, K.A., Bal, V.H., Huerta, M., Pickles, A., Øyen, A.S., Stoltenberg, C., Lord, C. and Bishop, S.L., 2016. Multidimensional influences on autism symptom measures: implications for use in etiological research. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*(12), pp.1054-1063.

Hood, C.O. and Badour, C.L., 2020. The Effects of Posttraumatic Stress and Trauma-Focused Disclosure on Experimental Pain Sensitivity Among Trauma-Exposed Women. *Journal of traumatic stress*, *33*(6), pp.1071-1081.

Howard, A. R. H., Lynch, A. K., Call, C. D., & Cross, D. R. (2020). Sensory processing in children with a history of maltreatment: An occupational therapy perspective. Vulnerable Children and Youth Studies, 15(1), 60–67

Ingram IV, P.B., Lichtenberg, J.W. and Clarke, E., 2016. Self-stigma, personality traits, and willingness to seek treatment in a community sample. *Psychological Services*, *13*(3), p.300.

Karaca Dinç, P., Oktay, S. and Durak Batıgün, A., 2021. Mediation role of alexithymia, sensory processing sensitivity and emotional-mental processes between childhood trauma and adult psychopathology: a self-report study. *BMC psychiatry*, *21*, pp.1-10.

Kart, A. and Türkçapar, H., 2019. The effects of childhood emotional abuse on aggressive obsessions among patients with obsessive compulsive disorder may be mediated by symptoms of depression and anxiety. *Psychiatry and Clinical Psychopharmacology*, *29*(4), pp.411-417.

Johnstone, L. and Dallos, R., 2013. Introduction to formulation. In *Formulation in psychology and psychotherapy* (pp. 1-17). Routledge.

Joseph, R.Y., Casteleijn, D., van der Linde, J. and Franzsen, D., 2021. Sensory modulation dysfunction in child victims of trauma: A scoping review. *Journal of child & adolescent trauma*, pp.1-16.

Juffer, F. and Series, W.A.C., 2008. THE EFFECTS OF EARLY SOCIAL-EMOTIONAL AND RELATIONSHIP EXPERIENCE ON THE DEVELOPMENT OF YOUNG ORPHANAGE CHILDREN. *Monogr Soc Res Child Dev*, *73*(3), p.295.

Luyten, P., & Fonagy, P. (2019). Mentalizing and trauma. In A. Bateman & P. Fonagy (Eds.), *Handbook of mentalizing in mental health practice* (2nd ed., pp. 79–88). Washington, DC: American Psychiatric Publishing Inc.

Maddox, B.B., Brodkin, E.S., Calkins, M.E., Shea, K., Mullan, K., Hostager, J., Mandell, D.S. and Miller, J.S., 2017. The accuracy of the ADOS-2 in identifying autism among adults with

complex psychiatric conditions. *Journal of autism and developmental disorders*, *47*, pp.2703-2709.

Mazefsky, C. A., Herrington, J., Siegel, M., Scarpa, A., Maddox, B. B., Scahill, L., & White, S. W. (2013). The role of emotion regulation in autism spectrum disorder. Journal of the American Academy of Child & Adolescent Psychiatry, 52, 679 – 688. http://dx.doi.org/10.1016/j.jaac .2013.05.006

Masterson, J., 1976. Psychotherapy of the Borderline Adult New York: Brunner.

May-Benson, T.A. and Koomar, J.A., 2010. Systematic review of the research evidence examining the effectiveness of interventions using a sensory integrative approach for children. *The American Journal of Occupational Therapy*, *64*(3), pp.403-414.

McConnico, N., Boynton-Jarrett, R., Bailey, C. and Nandi, M., 2016. A framework for trauma-sensitive schools. *Zero to Three*, *36*(5), pp.36-44.

Michael, T., Halligan, S.L., Clark, D.M. and Ehlers, A., 2007. Rumination in posttraumatic stress disorder. *Depression and anxiety*, *24*(5), pp.307-317.

Mikulincer, M. and Shaver, P.R., 2007. Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological inquiry*, *18*(3), pp.139-156.

Miller, M.L. and Brock, R.L., 2017. The effect of trauma on the severity of obsessive-compulsive spectrum symptoms: A meta-analysis. *Journal of anxiety disorders*, *47*, pp.29-44.

Milton, D., Gurbuz, E., & López, B. (2022). The 'double empathy problem': Ten years on. *Autism*, *26*(8), 1901-1903.

Murphy, D. and Broyd, J.G., 2023. Suspected feigning of autism in adults: a clinician survey, indications and proposed guidelines. *Advances in Autism*, *9*(1), pp.29-41.

Nietlisbach, G. and Maercker, A., 2009. Social cognition and interpersonal impairments in trauma survivors with PTSD. *Journal of Aggression, Maltreatment & Trauma*, *18*(4), pp.382-402.

Nietlisbach, G. and Maercker, A., 2009. Effects of social exclusion in trauma survivors with posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *1*(4), p.323.

Orsini, M. and Smith, M., 2010. Social movements, knowledge and public policy: the case of autism activism in Canada and the US. *Critical policy studies*, *4*(1), pp.38-57.

Palanza, P. and Parmigiani, S., 2017. How does sex matter? Behavior, stress and animal models of neurobehavioral disorders. *Neuroscience & Biobehavioral Reviews*, *76*, pp.134-143.

Park, S., Hong, J.P., Bae, J.N., Cho, S.J., Lee, D.W., Lee, J.Y., Chang, S.M., Jeon, H.J., Hahm, B.J., Lee, Y.M. and Seong, S., 2014. Impact of childhood exposure to psychological trauma on the risk of psychiatric disorders and somatic discomfort: Single vs. multiple types of psychological trauma. *Psychiatry Research*, *219*(3), pp.443-449.

Pearson, A. and Rose, K., 2021. A conceptual analysis of autistic masking: Understanding the narrative of stigma and the illusion of choice. *Autism in Adulthood*, *3*(1), pp.52-60.

Perry, B. D. (2019). The neurosequential model. *The handbook of therapeutic care for children: Evidence-informed approaches to working with traumatized children and adolescents in foster, kinship and adoptive care*, *137*.

Rukiye, A.Y. and Erbay, L.G., 2018. Relationship between childhood trauma and suicide probability in obsessive-compulsive disorder. *Psychiatry research*, *261*, pp.132-136.

Santarnecchi, E., Bossini, L., Vatti, G., Fagiolini, A., La Porta, P., Di Lorenzo, G., ... & Rossi, A. (2019). Psychological and brain connectivity changes following trauma-focused CBT and EMDR treatment in single-episode PTSD patients. *Frontiers in psychology*, *10*, 301661.

Schimmenti, A., Sideli, L., La Marca, L., Gori, A. and Terrone, G., 2020. Reliability, validity, and factor structure of the maladaptive daydreaming scale (MDS–16) in an Italian sample. *Journal of Personality Assessment*, *102*(5), pp.689-701.

Serafini, G., Pompili, M., Borgwardt, S., Houenou, J., Geoffroy, P. A., Jardri, R., … Amore, M. (2014). Brain changes in early-onset bipolar and unipolar depressive disorders: A systematic review in children and adolescents. European Child and Adolescent Psychiatry, 23, 1023–1041.

Somer, E., Abu-Rayya, H.M. and Brenner, R., 2021. Childhood trauma and maladaptive daydreaming: Fantasy functions and themes in a multi-country sample. *Journal of Trauma & Dissociation*, *22*(3), pp.288-303.

Stein, M.B., Hanna, C., Koverola, C., Torchia, M. and McCLARTY, B.L.A.K.E., 1997. Structural brain changes in PTSD. Does trauma alter neuroanatomy?. *Annals of the New York Academy of Sciences*, *821*, pp.76-82.

Strodl, E. and Wylie, L., 2020. Childhood trauma and disordered eating: Exploring the role of alexithymia and beliefs about emotions. *Appetite*, *154*, p.104802.

TeBockhorst, S.F., O'Halloran, M.S. and Nyline, B.N., 2015. Tonic immobility among survivors of sexual assault. *Psychological trauma: theory, research, practice, and policy*, *7*(2), p.171.

Teicher, M.H. and Samson, J.A., 2016. Annual research review: enduring neurobiological effects of childhood abuse and neglect. *Journal of child psychology and psychiatry*, *57*(3), pp.241-266.

Tonna, M., Marchesi, C. and Parmigiani, S., 2019. The biological origins of rituals: An interdisciplinary perspective. *Neuroscience & Biobehavioral Reviews*, *98*, pp.95-106.

Vasquez, M. and Miller, N., 2018. Aggression in children with reactive attachment disorder: A sign of deficits in emotional regulatory processes?. *Journal of Aggression, Maltreatment & Trauma*, *27*(4), pp.347-366.

Vissoker, R.E., Latzer, Y., Stolar, O., Rabenbach, A. and Gal, E., 2019. Eating problems and patterns among toddlers and young boys with and without autism spectrum disorders. *Research in Autism Spectrum Disorders*, *59*, pp.1-9.

Von Knorring, A.L. and Hultcrantz, E., 2020. Asylum-seeking children with resignation syndrome: catatonia or traumatic withdrawal syndrome?. *European child & adolescent psychiatry*, *29*, pp.1103-1109.

Vorria, P., Wolkind, S., Rutter, M., Pickles, A. and Hobsbaum, A., 1998. A comparative study of Greek children in long-term residential group care and in two-parent families: I. Social, emotional, and behavioural differences. *Journal of Child Psychology and Psychiatry*, *39*(2), pp.225-236.

Warner, E., Koomar, J. and Westcott, A., 2009. Arousal regulation in traumatized children, sensorimotor interventions. In *International Trauma Conference*.

Warrier, V., & Baron-Cohen, S. (2021). Childhood trauma, life-time self-harm, and suicidal behaviour and ideation are associated with polygenic scores for autism. *Molecular psychiatry*, *26*(5), 1670-1684.

Zeanah, C.H. and Sonuga-Barke, E.J., 2016. The effects of early trauma and deprivation on human development–from measuring cumulative risk to characterizing specific mechanisms. *Journal of Child Psychology and Psychiatry*, *57*(10), pp.1099-1102.

Zhang, Z., Peng, P., & Zhang, D. (2020). Executive function in high-functioning autism spectrum disorder: a meta-analysis of fMRI studies. *Journal of autism and developmental disorders*, *50*, 4022-4038.