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Review

A Scoping Review of School-Based Strategies for Addressing Anxiety, Intolerance of Uncertainty and Prediction in Autistic Pupils

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Abstract: In a typical school day, young people need to do many tasks which rely on the ability to predict. Since prediction underpins cognitive and social skills, difficulties with prediction lead to multiple challenges to learning. In this review, we consider the evidence that autistic people often have difficulty making predictions about other people's behaviour, or understanding what they are required to do, contributing to high rates of anxiety and intolerance of uncertainty. The focus of the review is to consider what we already know about effective strategies used by schools to support learning and social inclusion and to consider how we might build on these approaches. We propose a number of so far unexplored ideas with the potential to build predictive skills and which require evaluation.

Keywords: autism; anxiety; intolerance of uncertainty; prediction; education practice

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1. Introduction

Autistic children frequently experience higher levels of anxiety than neurotypical children [1]. It is imperative for schools to reduce the degree of anxiety experienced since the associated stress forms an impediment to learning, affects quality of life [2] and if compounded into toxic stress can have long-term health implications [3]. Although a number of factors are associated with the build-up of anxiety, they all converge in an Intolerance of Uncertainty (IU) [4]. In this paper we explore the suggestion that IU may stem from a difficulty with prediction which some neurocognitive researchers see as an aspect of autism [5]. Our argument is that if educators understand that prediction may be a challenge for autistic pupils, they may be persuaded to utilise appropriate strategies with greater creativity, consistency and fidelity. The method by which we might teach prediction appears to have received limited focus within the extant literature.

In order to support autistic pupils, schools need to understand the way the environment can present challenges to successful inclusion, so that these can be minimised, and teachers can benefit from an insight into the barriers to learning. We argue that the ability to predict is necessary for successful school inclusion and learning and this understanding could support the development of more effective school support. Navigating through the school day requires students to be able to follow rules, conclude tasks, demonstrate learning, manage the timetable and form and maintain social relationships. Tasks include both low level motor and cognitive tasks, such as queuing in the dining hall, dressing, or matching shapes, as well as higher-order cognitive and social examples all of which rely on the ability to predict. "Understanding what others are doing and what they are going to do next constitutes a major hallmark of social cognition achievement" [6] (p. 1).

Although it could be argued that schools, as rule-bound institutions, reduce the need to predict, this is only the case to a certain point. There is an expectation on pupils to be able to generalise rules to novel situations, both cognitively and socially, and to be able to anticipate expected behaviour. The expectation in early years education is that children will

quickly learn what is expected through observation, understanding of instructions, and applying something learned in one situation to another. Prediction is part of most activities that make up the school day, where consequences of a decision lead to reward or criticism. It starts with simple choices such as the decision to write in pencil so it can be rubbed out, or in pen which is the requirement but may be messy. It continues with a cognitive task such as reading [7] where children are expected to use pictures and their understanding of context to predict an unknown word [8]. Prediction is of prime importance in managing expected behaviour while considering social consequences to, for example, refusing to join in a practical joke.

As children progress through primary school the expectations of behaviour for learning and socially appropriate behaviour increase, and the consequences of falling outside what is acceptable grow. All schools have 'hidden curriculums' which autistic students find very difficult to understand and follow [9]. Autistic students are frequently slower to learn the rules, needing more practice, examples and explanations before they can confidently predict what is expected. Transition into mainstream secondary schools has been shown to be a particular challenge for autistic pupils, e.g., [10,11]. This is related to an unfamiliar environment with expected reduced anxiety once transition is accomplished. Costley, Emerson, Ropar and Sheppard [12] found that anxiety continued, despite familiarity and the considerable efforts of schools to offer appropriate support. This suggests the need for continuance of helpful strategies that make school more predictable throughout education.

To some extent, the difficulty autistic children experience with prediction is recognised in the typical supports they receive such as visual timetables, structured tasks, scaffolding and modelling, but even with these supports schools cannot be made completely predictable and therefore remain places prompting high levels of anxiety. The widespread adoption of support strategies suggest they are helpful to many students [13], but there is evidence that even evidence-based strategies are not used consistently and with fidelity in schools (see: [14–16]). Anglim, Prendeville and Kinsella [14] found teachers to lack confidence in teaching autistic students and were left to pursue a 'trial and error' approach to support. Classrooms cannot be made completely predictable, and therefore remain places prompting high levels of anxiety. Lack of fidelity of implementation limits effectiveness and training is not always successful in improving this [16]. Teachers have limited understanding of autism [17] but implementation of appropriate interventions can be increased when teachers have a greater understanding of core components [18]. We argue that awareness of the aspect of prediction as a fundamental skill is not usually foregrounded, leading to missed opportunities for support, both in terms of the use of established interventions, and through the creation of new ones.

2. Causes of Anxiety

Anxiety in autistic school children is pervasive and has a considerable impact on emotional and cognitive adjustment and success [19]. Varying causes for this have been suggested, such as sensory discomfort [20], difficulties understanding other people's behaviour (14) and communication impairment [21]. The relationship between anxiety and autistic characteristics such as repetitive behaviours, rigid thinking and difficulties with emotional regulation (ER) has been mapped in models such as those by Boulter, Freeston, South and Rogers [22] and South and Rodgers [23]. Anxiety is linked with sensory differences and alexithymia, in addition to IU, but debate continues about the nature of the relationship between these features [24]. Boulter et al. [22] suggest that people on the autism spectrum have a susceptibility to IU which leads to high levels of anxiety. They propose that the relevant question then becomes "what makes children with ASD so intolerant of uncertainty" (p. 1398). Their suggested answer to this question is that IU stems from social/environmental factors, rigidity of thought, and difficulty with emotion processing and sensory sensitivities which then lead to restricted and repetitive behaviours and anxiety. South and Rodgers [23] build on this model with the insertion of alexithymia and suggest it as a framework for future studies, with a particular focus on the causal links among the

constructs. They see sensory sensitivities, alexithymia and IU as closely related to each other and as strong predictors of anxiety in ASD.

Intolerance of uncertainty has been studied in the general population in relation to generalised anxiety, social anxiety and obsessive–compulsive disorders where behaviours are seen "as futile attempts to gain certainty about the future" [4] (p. 140). Boulter et al. [22] suggest that IU offers a framework for understanding autism. People experiencing IU react negatively, in terms of emotions, cognitions and behaviours, when faced with uncertainty leading to a belief that "unexpected events are negative and should be avoided" (ibid, p. 1392). Autistic people may then respond to anything which is unclear as threatening and may experience an inability to function described as 'uncertainty paralysis' as well as 'uncertainty distress' [25]. It is proposed that this provides an explanation for the predominance of special interests within the autistic population, being a way to understand everything about a specific topic so that nothing is uncertain. In this model fixed interests would not, therefore, be a core feature of ASD but would result from IU. Hodgson, Freeston, Honey and Rodgers [26] suggested that IU could be a potential mediator between autism and anxiety.

Difficulties understanding the motives and behaviours of others, related to a deficit in Theory of Mind, would contribute to a sense of unpredictability and heightened anxiety [27]. Hyperawareness to what are perceived as threats makes people more susceptible to sensory input, which is experienced as aversive [28] with IU directly impacting children's sensory sensitivities. Wigham, Rodgers, South, McConachie and Freeston [29]) found links between sensory differences and insistence on sameness and repetitive motor behaviours and saw sensory issues predicting anxiety rather than the reverse but leave open the possibility of an alternative order to the sequence. It is possible that the link between IU and sensory sensitivity is circular and potentially a spiral of intensifying difficulties.

Emotion regulation is the focus of Conner et al. [1] who suggest that a difficulty in this regard can be a manifestation of anxiety leading to sensory sensitivity, alexithymia, IU and further anxiety. They therefore suggest a circular link where anxiety is caused by impaired emotion regulation, but that high anxiety may limit regulation, suggesting a focus on improving ER would lead to decreased anxiety. Alternatively, sensory processing difficulties are proposed to increase IU leading to anxiety and repetitive behaviours [26].

3. Prediction

Prediction is a fundamental skill which is seen as the foundation of human development and learning, for example prediction is studied within cognitive neuroscience as underpinning the development of language [30] although the directional relationship between prediction and language is debated by Rabagliati, Gambi and Pickering [31]. Sensory representations within the brain allow the determination of future actions [32] and the brain "works to model its environment, in this way ensuring that it can regulate its internal and external conditions for the sake of survival" [33] (p. 1). Furthermore, Bar [34] proposes "the cognitive brain relies on memory-based predictions, and these predictions are generated continually either based on gist information gleaned from the senses or driven by thought" (p. 280). Through perception of sensation, and by using the motor system as a feed-forward model [6], people learn to generate predictions of what is about to happen, or what is required of them. People first learn to plan their own actions through sensory-motor feedback, and use this to decode the actions of others, allowing us to predict their response to us or the environment based on previous similar experiences.

All people are driven to reduce uncertainty by making predictions and seeking control. Stress is a response to environmental changes where the individual is uncertain about what to do to ensure their wellbeing [3]. The process of learning involves making predictions and comparing to subsequent experience [35]. As we learn we tend to make frequent errors in this process and once an error has increased a stress reaction this diminishes the ability to make a correct prediction. "Clearly, if we experience the world as uncertain or ambiguous,

we want to suspend learning. Conversely, if we experience it as predictable and lucid, we want to consolidate what we have learned" [3] (p. 177).

We constantly utilise our senses to work out what is happening around us and to predict what might happen next, but autistic differences in interpretation of sensory input may limit the ability to understand the environment. Van de Cruys et al. [5] explain the core characteristics of autism i.e., difficulties in executive functioning, theory of mind and central coherence, as stemming from an inability to filter relevant from irrelevant sensory input and giving too much weight to information that typically developing people would learn to deprioritise or ignore. Every situation is experienced as new and unfamiliar, leading to most cognitive resource being focused on making sense of the environment. Autistic individuals, therefore, frequently experience the world as unpredictable, as learning from experience is impeded, which then leads to persistent levels of anxiety that in turn affect day-to-day functioning, including the ability to predict [24,36,37].

Sinha, Kjelgaard, Gandhi, Tsourides, Cardinaux, Patazis, Diamond and Held [38] theorise autism as a disorder of prediction. Lack of predictive ability makes the world constantly uncertain, which leads to feelings of lack of control and the inability to take preparatory actions in any situation. This theory provides an explanation for the key features of ASD i.e., insistence on sameness, sensory hypersensitivity, difficulties in interacting with dynamic objects, difficulties with theory of mind, and islands of proficiency. For example, "rituals and an insistence on sameness may be a consequence of, and a way to mitigate, anxiety arising out of unpredictability" [38] (p. 15221). Similarly, sensory hypersensitivity is explained by a lack of ability to habituate, due to lack of prediction. This would also provide a plausible explanation for the social interaction difficulties experienced by people with autism, since many aspects of communication rely on implicit meaning, and for this people require the ability to predict [35]. Van de Cruys et al. [5], however, disagree that people with ASD have a 'disorder' of prediction; experiments in laboratories demonstrate appropriate prediction when interference, or 'noise', is kept to a minimum. Their alternative theory is that autistic people struggle to discern what are the most salient stimuli to attend to, in order to join incoming sensations with existing knowledge. This view is supported by Amoruso et al. [6] in their comparison of autistic and neurotypical children. Both groups could predict at similar levels when there was sufficient perceptual information present, but the autistic children performed less well than typical controls when the setting was more ambiguous. They conclude that "it is not sensory perception itself which is compromised in ASD but its interpretation" (ibid, p. 6). Amoruso et al. [6] also found that higher levels of anxiety reduced the ability to predict in the autistic participants. They propose that the difficulty their participants had with relying on previous knowledge to make predictions led to a view of the world as unstable which leads to a stress response. Robertson, Stanfield, Watt, Barry, Day, Cormack and Melville [39] cite disorder of prediction as an 'emerging hypothesis' and agree that inability to predict would cause stress. They note that this is worth further exploration, but to our knowledge no one has yet explicitly factored this into existing models of anxiety in ASD. By adopting disorder of prediction as a key factor in ASD we suggest the following working model. This is simplified to include some key aspects of autism, but not all.

In our simple model (Figure 1), lack of focus of attention on the most salient input leads to errors in prediction, leading to a classic autistic profile of someone who struggles to understand the motives and communication of others, and who is highly anxious in social situations, which present as unpredictable and frightening. The lack of certainty and difficulties with theory of mind lead to anxiety which, in turn, leads to, and intensifies in a circular route, manifestations of autism such as repetitive behaviours and ER difficulties. Although in this model sensory difference and disturbance is seen as the outward manifestation of errors in prediction, it is also suggested that it is differences within the sensory-motor feedback loop that starts the entire process [27,32]. We recognise, in this model, that some students, perhaps those with less capacity for self-reflection, may experience IU and difficulties with theory of mind, leading to typical autistic characteristics,

but without associated anxiety. The importance of the model in educational terms is in providing insight into strategies targeting different stages of the process.

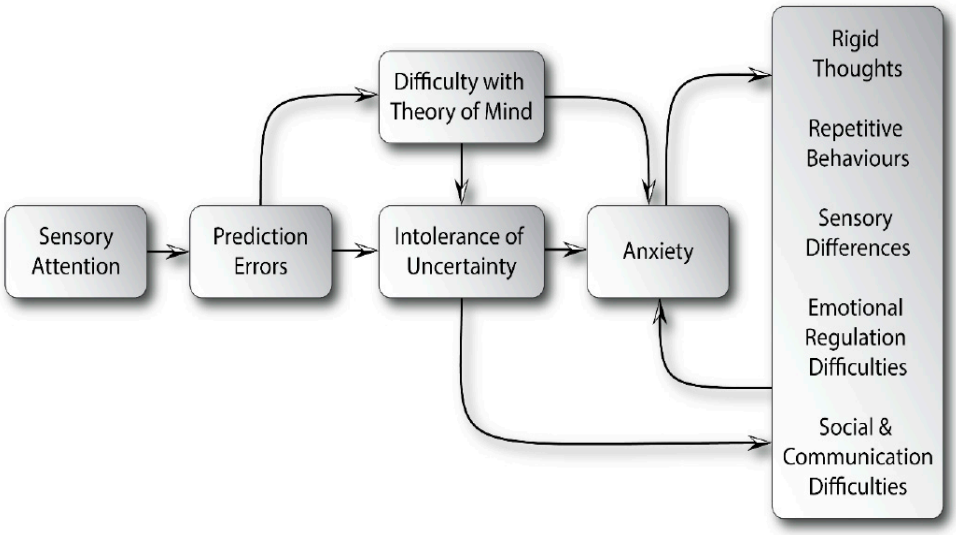

Figure 1. Simple model of the impact of disorder of prediction in autism.

The work of Van de Cruys et al. [5] proposing a specific difficulty with prediction, together with intolerance of uncertainty [26], as a potential mediator between autism and anxiety is particularly important as we try to understand and plan support for students. Many autistic people endorse the view of autism as a difference, rather than a disorder, and the use of both 'neurodivergent' and 'neurotypical' have been widely adopted. To add an additional 'disorder' could be seen to be a retrograde step; however, if we are to develop effective education that supports the cognitive and social development of autistic students, teaching the ability to predict would appear to be important. We therefore justify the somewhat uncomfortable focus on impairment, in order to reach an understanding of what may lead to optimal educational outcomes for autistic students. A consideration of prediction as a key skill does not preclude the strength that many autistic people have of being able to focus intently when the situation is right for them, hypothesised to lead to considerable skill and aptitude.

We have considered the cognitive challenges people may encounter that impact learning and social functioning. In addition, there are the considerable emotional impacts on autistic people of constantly having to negotiate school and society which is not constructed for their needs and may be experienced as uncomfortable, hostile or even abusive. The constant struggle to fit into a neurotypical world, as well as leading to anxiety, can lead to feelings of failure and lack of self-esteem. Autistic children require families and schools that have insight into their experiences and seek to gain mutual understanding, linked to the 'double empathy' concept [40]. The focus for the rest of the paper is on strategies that manage sensory input and remove the need for prediction skills alongside ways to potentially build the ability to predict.

4. The Role of Schools

A scoping literature review of strategies for teaching prediction, both in relation to neurotypical and autistic students, yielded few results. Google Scholar was used with keywords such as 'teach, learn, predict, skill, meta-cognition'. Most combinations yielded no or few relevant articles, with the majority of papers retrieved focusing on factors which would predict another factor. All publication dates were included, titles from the first 3 pages scanned and abstracts of anything which appeared to be relevant read. A total of 7 papers which made some suggestions about how prediction might be taught or developed were identified. Citations in and of these papers were also used to identify a few more

sources. All established ideas that would seem to support prediction development are included here, along with some suggestions, from experience, for potential practice.

4.1. Managing Sensory Input

Most UK schools which include autistic pupils understand the need to avoid sensory overwhelm. It is an ongoing challenge for schools to address sensory sensitivity since classrooms, corridors, dining rooms and playgrounds are inevitably noisy, full of movement and rife with different smells. In many schools the need for children to avoid the sensory overload of crowded corridors is enacted in passes to leave classes earlier. The social minefield of the playground, with its myriad uncertainties, is frequently avoided by autistic secondary school students who, for example, retreat to a club with like-minded people or take refuge in a support centre. It can be argued that schools respond to the most evident observable sensory assaults but may miss other aspects of sensory experience that impact learning. "Sensory differences, particularly within the auditory and tactile domain have a profound impact on learning. Responses from parents and teachers suggested that unpredictability and lack of control over stimuli caused specific challenges for pupils with ASD" [19] (p. 11).

To date the focus of many accommodations for autistic pupils is avoidance of problematic situations and environments, such as through the use of noise cancelling headphones to reduce discomfort and allow improved attention. Recognition of the role of sensory overwhelm contributing to anxiety and IU means it is essential that schools continue and build on these practices. What is less discussed is the potential of explicitly teaching autistic pupils to know the most salient sensory input to attend to, addressing the issue at its foundation. Technology may offer opportunities to practise focus on salient information and ignoring of distracting environments.

4.2. Reducing the Need to Predict

Most strategies implemented in mainstream schools to support autistic students have at least an element of building certainty. These often take away the need to predict by laying out what will happen at a given time of the day. The use of timetables and planners helps students know what to expect each day [11]. The TEACCH programme [41] provides highly structured tasks within a reduced distraction environment to allow focus and predictability. Another approach with an evidence base is Social Stories [42] which helps autistic students to understand what is likely to happen and what is expected in a specific context. These need to be implemented not just reactively, when a student has demonstrated their difficulty in a specific situation, but also as a means of teaching prediction. It is key that teachers clearly scaffold tasks, and provide clear, differentiated instructions for all tasks, along with time for processing [5,43]. To help students to learn appropriate social behaviour, clear instructions need to be provided for each situation, preferably in written form, and consequences for errors in expected behaviour should be teaching opportunities rather than leading to punishment or withdrawal of privileges.

4.3. Teach the Hidden Curriculum

A whole-school approach to teaching the hidden curriculum could assist students in reducing anxiety, not just for autistic students. Teachers and students appreciating that not everyone thinks in the same way or arrives with the same knowledge could help to create a supportive inclusive culture. Smith-Myles and Simpson [9] suggest a systematic approach "through a process of instruction and interpretation" (p. 281). They note that when children lack foundational understanding of social requirements they learn how to behave by rote, leading to poor generalisation. They suggest analysis of pupil skills followed by direct instruction through a six-step process including explanation, modelling and evaluation. They promote the sort of simulation provided by acting lessons and specific self-esteem building along with other targeted interventions.

4.4. Prediction Used in Teaching

As the ability to predict is the basis of all learning, students can be aided by utilising their extant prediction skills [44]. For example, teachers often use analogies as a process of drawing inferences in order to predict what one situation can tell us about another [45]. Prediction both facilitates learning and provides an insight into individual understanding and process [44]. Asking students to predict helps uncover their prior knowledge and identifies misconceptions, providing an insight into their internal schema. "Our ability to predict or anticipate allows us to engage in thought experiments and make conjectures" [44] (p. 1240). In many subjects, and particularly in science teaching, student engagement can be encouraged by asking them to predict, which encourages the utilisation of prior knowledge. When discussing maths education Lim et al. [44] suggest using prediction extensively with multiple benefits such as noticing structural features. In the current British education system secondary school children are taught about mathematical prediction, in the form of probabilities which are rule-bound and different from the typical predictions needed within social interactions. The knowledge of how to apply previous experience, and probabilities, to estimate whether something is likely to happen, is not currently explicitly taught and all students are expected to learn this vicariously. We advocate an awareness of the need to teach what we term 'situational prediction', which needs to be embedded in the curriculum for all students, in recognition that even if this were a specific difficulty for autistic students, many students would benefit from learning to predict to guide them, particularly through their teenage years.

4.5. Teaching Prediction

The focus of most research is how to use the skill of prediction to teach other aspects, rather than in how we might teach prediction itself. Cannon, O'Brien, Bungert and Sinha [46], in their review of 47 prediction papers, found no evidence that predictive difficulties can be improved through training. They cite papers that suggest explicit instruction may be effective, as identified by Brigham and Hartman (2010) in their study of teaching prediction to deaf students to improve their reading skills. Their explicit instruction comprised a time-line, constructivist approach to teaching and repetition with different material [47]. Similarly, Afflerbach (1990) suggests the use of cues, prior knowledge, and modelling of 'comprehension monitoring prediction strategies' (p. 146) for students developing reading comprehension [48]. It appears that little has been written about how we might teach students to predict, other than in relation to specific aspects of knowledge. Strategies highlighted in research include visual aids, imitation and sensory awareness.

Additional visual aids are frequently used in the teaching of reading where students are overtly instructed to use visual cues to make inferences about the words they are seeking to decode. To improve comprehension and formulate ideas, Kucukoglu [8] suggests ways to teach prediction include "teacher modelling, predicting throughout the text: with partners, with a graphic organizer, or using post-it notes throughout the text" [8] (p. 710). Pupils predict at specific points as they read, consider the accuracy of their prediction and revise if needed. This would be a form of teaching the student to predict by guiding them through the process of understanding where to place their attention and how to piece together relevant information. Using notes within the text would assist working memory so that each 'clue' can be identified and thought of separately, before being assimilated into a hypothesis of what is likely to happen. In this scenario the teacher is likely to remind the individual of a relevant prior experience that they can relate to. In this way teaching prediction is a form of making evident the usually automatic process we go through when decision making, and modelling this process to the student.

There is evidence for the effectiveness of video modelling and imitation as successful interventions for autistic pupils. Video-modelling is seen as successful for a number of factors, including that it provides a restricted field of focus helping the viewer to know what to pay attention to [49]. It also offers repetition of the same material, and precise actions, making the optimum environment for retention. It could be that this affords another route

to learning prediction—a 'learning by doing'. Davachi and DuBrow [50] propose that sequential learning of commonly encountered events allows the forming of predictions and subsequently the planning of future actions.

Given the role of sensory awareness and focus as an aspect of prediction we propose teaching the meta-process of paying attention to the necessary information within a specific context, an idea that Cannon et al. [46] suggest may have traction. Van de Cruys et al. [5] stress the value of opportunities to learn experientially, through gradually scaffolded guidance, and virtual reality, since avoidance of social learning will lead to further social difficulties. They also highlight the role of imitation as a useful way to learn, giving an advantage to children in mainstream schools with typically developing peers. Imitation in the form of echoed speech has been found to benefit minimally verbal children in developing their communication skills [51].

4.6. Social and Emotional States and Relationships

Building and sustaining positive relationships can be challenging for students, and much more so when anticipating how someone may behave, or what they may want from you, is difficult. Schools need to educate staff and pupils to build understanding of the need for clear explanation, avoidance of idiom and metaphor without explanation, patience with those who struggle to understand or regularly make social 'faux pas'. Some indications of how to support students with their emotional development come from studies of Cognitive Behaviour Therapy (CBT) to treat anxiety. In a review of studies Lin, Wood, Storch and Sze [52] identified the importance of including visual aids such as cartoons, drawing, photography and video modelling to help students both gain insight, build control and generalise skills. Research supports the breaking down of abstract ideas, clear and explicit instructions and supporting the child to recognise their emotional state. This included helping them to be aware of the physical signs of anxiety. Within CBT, as in teaching, the use of the child's own special interests was found to act as motivators and vehicles for learning and practising coping skills.

4.7. Understand Accommodations

Some characteristics of autism can be seen to serve a positive function for autistic students. The theory of 'monotropism' [53], which has been adopted by many autistic researchers, regards a strength of focus and attention where someone is able to reduce sensory overload through a hyperfocus on a particular sensation or activity. Allowing students to learn through their interests helps to reduce anxiety by increasing predictability, and by reducing arousal has a positive impact on well-being [54]. Palmer et al. [33] suggest that repetitive movements, frequently discouraged as a behaviour, bring about increased predictability.

5. Conclusions

There is agreement among researchers that anxiety and IU are closely linked. Seeing IU as leading to anxiety, as proposed by Hodgson et al. [26], we offer a difficulty with prediction as the answer to Boulter et al. [22] asking what causes IU. Schools already make considerable efforts to alleviate pupil anxiety but without complete success, due to a lack of fidelity of implementation, and our limited knowledge of how to teach prediction. A double-pronged approach by schools to both reduce the need to predict and teach prediction appears to be worthy of examination as a means to enhance learning and improve mental well-being.

Although schools show awareness of the use of appropriate strategies, the level of insight into IU is unclear. Research suggests that staff training does not provide the depth of knowledge that would be desirable to fully support the development of prediction to counter IU. "Conceptual barriers not only hinder novel ways of thinking about learning" [55] (p. 2) but impact on teachers' abilities to overcome constraints on progress. It is possible that a greater understanding of this concept by all school staff, and pupils, would

lead to greater adherence to support strategies and a more conducive culture where the need for certainty would lead to adaptations to systems and staff behaviour. We suggest there needs to be an increased depth of understanding of the lived experience of autism; for example, knowing that a student finds noise difficult to tolerate needs to lead to an awareness that autistic pupils are likely to be in a state of heightened arousal from the time they leave home in the morning as they are concerned about what they cannot predict. The routine provision of a quiet place to allow a calm entry to school could be beneficial for many students.

We are keen to work within the concept of neurodiversity and advocate Universal Design for Learning [56] to support all students; however, we also suggest that it would be helpful for educators to consider and investigate the predictive abilities of autistic students. This is not in order to stigmatise, but rather to build more effective supportive strategies. Our understanding is that prediction, as a life skill that helps all of us to feel more certain in even an unfamiliar setting, is not currently taught in schools. A greater ability to predict is likely to be an important life skill, enhancing resilience and well-being. Research needs to focus on both the role of prediction in autistic students and the development of effective teaching of prediction.

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