Preventing Unmet Need from Leading to School Exclusion: Empowering Schools to Identify Neurodiversity Earlier

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Acknowledgements

Abstract

Background: School exclusion is a key precursor for poor outcomes. The most commonly reported reason for exclusion is 'persistent disruptive behaviour'. One possible driver of disruptive behaviour is unmet need related to neurodevelopmental conditions (e.g. Autism Spectrum Disorder, ASD). However, schools are often unaware of neurodevelopmental needs, whilst clinical services are plagued with lengthy waiting lists. Thus, children's needs are often not identified in a timely, holistic manner. Evidence suggests the Early Years Foundation Stage Profile (EYFSP) may allow schools to identify neurodevelopmental needs. However, a population level, place-based approach is needed to understand local systems and identify potential solutions.

Aims: The first aim was to understand the relationship between ASD and school exclusion across a district. The second aim was to understand how stakeholders and systems can operate cohesively to develop and implement an Electronic Neurodiversity Profiling Tool (ENPT) as a transformative way of working.

Methods: Through mixed methods, the Connecting Lived Experiences with Visualisation of Electronic Records (CLEVER) framework combined analysis of population level data with stakeholder perspectives to offer a holistic understanding of the issues. For the first time in England, routine administrative data from health and education were connected to understand the relationship between ASD and exclusion, employing logistic regression analysis. Discussions across the district pointed towards the utility of an evidence-based profiling tool to support schools to develop a more timely, holistic understanding of children's behaviour. This created an opportunity for the development of the ENPT. Semi-structured interviews were held with 7 professionals involved in the ENPT project to understand associated barriers and opportunities. Data were analysed using Reflexive Thematic Analysis.

Results: Overall rates of exclusion were higher in secondary school, whilst students with pending diagnoses consistently showed a higher rate of exclusion than those with either a confirmed diagnosis of ASD, or no diagnosis at all. A diagnosis of ASD decreased the odds of exclusion in secondary school, but increased the odds in primary schools.

Four main themes were identified from the qualitative analysis: 'Making the Implicit Explicit'; 'Communicating with Each Other'; 'Respect and Recognition';

and 'The Big Picture of Acceptability'. Nine subthemes were identified, spanning both the development and implementation of the tool; the issues, challenges and opportunities were often apparent in both stages.

Conclusions: The results suggest that pupils awaiting a diagnosis of ASD are at an elevated risk of school exclusion. However, a diagnosis alone does not necessarily allow schools to effectively meet the needs of pupils with a neurodevelopmental condition. The findings offer exciting support for an alternative, needs-led way of working which may reduce reliance on pressured clinical services and empower schools to recognise neurodevelopmental needs much earlier, thereby reducing rates of school exclusion. It is hoped that the findings will inform the development of similar solutions beyond Bradford, serving as a 'toolkit' for services shifting towards a more connected way of working.

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Terminology

Language

Throughout this text, I have intentionally avoided the term 'disorder' where possible to avoid locating difficulty within the individual. Instead, I wish to reflect a neurodivergent-affirming stance where difficulty is located in the social context and systems surrounding the individual. Yet, I have also largely avoided the term 'neurodiversity', opting to use the term 'neurodevelopmental condition' for increased precision. This is used as an umbrella term to refer to a range of conditions associated with differences to the development of the brain and/or central nervous system, including but not limited to Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), and communication, speech or language disorders (American Psychiatric Association, 2013). In the quantitative analysis, ASD was used as a specific variable for pragmatic reasons. However, the comorbidity and significant overlap between this and other neurodevelopmental conditions is well-documented (Gillberg, 2010). Consequently, the use of an umbrella term was deemed to be most appropriate.

The term 'special educational needs and disabilities' (SEND), is also frequently used. A child with a neurodevelopmental condition is automatically identified by their school as having SEND. However, identified SEND does not necessarily imply that the child has a neurodevelopmental condition.

Moreover, the behaviour of children and young people with neurodevelopmental needs is a key focus of the thesis. Guldberg et al. (n.d) presented concerns from this group regarding usage of the term 'challenging behaviour', with questions asked about whose perspective drives such terminology. Participants preferred the term 'distress behaviours'. However, the authors considered that not all behaviour perceived by schools as challenging is necessarily reflective of distress, (i.e. 'happy noises'), and, in the context of multiple other perspectives on terminology, called for further consideration of the matter. In this report, I primarily use the term 'behaviours that challenge' to shift the focus to the person or setting that feels challenged by the behaviour (Guldberg et al., n.d.).

Abbreviations

The following table identifies the various abbreviations and acronyms used throughout, along with the page on which each is defined.

Abbreviation	Meaning	Page
ASD	Autism Spectrum Disorder	17
ENPT	Electronic Neurodiversity Profiling Tool	41
EYFSP	Early Years Foundation Stage Profile	42
NEET	Not in Education, Employment or Training	14
SEND	Special Educational Needs and Disabilities	16

Quantitative Study

Introduction: Part 1

School Exclusion

Formally, school exclusion is used as a disciplinary tool "if approaches towards behaviour management have been exhausted" in order to "ensure that other pupils and teaching staff are protected from disruption and can learn in safe, calm, and supportive environments" (Department for Education, 2022a). Government publications report on two types of exclusion, where temporary exclusion (also referred to as suspension or fixed term exclusion) involves exclusion from the school for up to 45 days, and permanent exclusion implies a pupil cannot return to the same school. However, it is well-recognised that official data only tell a partial story. Reports point towards the widespread use of other 'unofficial' or 'informal' forms of exclusion, including children being educated off school registers or simply disappearing from them, (Gill et al., 2017; Power & Taylor, 2020), non-attendance, including school refusal (Totsika et al., 2020), and various other forms that inevitably result in a wholly inequitable experience of education.

With regards to incidence, the latest available statistics reflect the spring term of 2021/22, though this time period was subject to national restrictions due to the impact of the COVID-19 pandemic where in-person school attendance was prioritised for key workers and vulnerable children (Department for Education, 2023). As a result, such data must be interpreted with caution and pre-pandemic data will be discussed here (Department for Education, 2021). In the 2018-2019 school year, national figures show that almost 8000 pupils were permanently excluded and over 438,000 were suspended, at a rate of 0.1 and 5.36, respectively (where 0.1 is the equivalent of 10 exclusions for every 10,000 pupils). Percentages for exclusion rates generally increase with pupil age with the highest rate seen in secondary schools, peaking at age 14 (Year 10) and reducing slightly in Year 11. This trend has shown stability for many years, even during the pandemic (Department for Education 2021; 2023).

With school serving as a springboard for opportunities in life, offering up the skills, knowledge, friendships and qualifications to partake in society, it is unsurprising that school exclusion is a key precursor for a myriad of negative sequalae (Daniels & Cole, 2010; Evans et al., 2009; Feng et al., 2015; Ford et al.,

2018; Graham et al., 2019; Parker et al., 2016). In an analysis of pupils reaching the end of Key Stage 4 in 2015/16, just 7% of those permanently excluded and 18% of children who experienced multiple fixed period exclusions went on to pass their English and maths GCSEs (Graham et al., 2019). Whilst the findings do not imply causality, many parents and carers of excluded children have indeed highlighted the detrimental impact of poorly managed exclusions, and the sub-standard education provided in alternative provisions (Graham et al., 2019). Exclusion may also have a significant impact on the child's psychological wellbeing (Ford et al., 2018; Parker et al., 2016), and this is likely to be sustained in the long-term, along with further poor outcomes in other domains such as involvement in crime and anti-social behaviour, social isolation and lack of social capital (Daniels & Cole, 2010). In addition, over one third of excluded children go on to be not in education, employment, or training (NEET; Evans et al., 2009). This group of young people are at an increased risk of various adverse outcomes, including experiences of depression, anxiety, substance misuse, chronic physical health problems, and lower status occupations even when employment is secured (Feng et al., 2015).

'Persistent disruptive behaviour' is reported as the most common reason for both temporary and permanent exclusion in UK schools (Department for Education 2021; 2023). However, it is well-established that the children most likely to be excluded from school are those who already experience significant vulnerability. Exclusion rates are more than four times higher for pupils eligible for free school meals, a proxy for low household income (Department for Education 2021). Indeed, poverty is highlighted in the literature as a key risk factor for exclusion, along with unsafe or unstable family environments or living situations, family members' mental health difficulties or substance abuse, violence, abuse, bereavements, or the imprisonment of a parent or close relative (Apland et al., 2017; Evans, 2009; Gill et al., 2017).

The mounting scientific evidence linking vulnerability and exclusion is supported by Cole et al.'s (2015) review of government policy, guidance documents and relevant academic literature from 1997 to 2015; the findings highlighted that school exclusion was associated with the experience of significant life challenges for children and young people. Indeed, when factors like poverty are held constant, these types of vulnerability can be some of the most significant risk factors for educational breakdown (Department for Education, 2019). This is referred to by

some as the 'vulnerability gap' (Quilter-Pinner & Gill, 2020). The impact of such vulnerability may be considered in conjunction with data showing the transition from primary to secondary school to be a time of heightened risk for exclusion (Department for Education, 2021; Timpson et al, 2019). It is reasonable to suggest that the smaller school size (John et al., 2022) and the more structured and nurturing support characteristic of primary education may serve as a buffer against adversity experienced outside of school. This level of support typically reduces in secondary education, creating the potential for existing vulnerabilities to be exacerbated. Thus, when entering the next stage in their education, such children are automatically in a position of significant disadvantage. This may lead to them becoming disaffected with the system (Menzies & Baars, 2015), paving the way for disengagement from education. In essence, behind the UK's disproportionate school exclusion rates appears to lie a wider set of inequalities faced by children and young people – outside of the school context and in the family home.

Behavioural Concerns Reflect Unmet Need

Children who experience adversity typically have less access to positive relationships, especially when the adversity stems from a parent or caregiver (Choi et al., 2020). This can result in disrupted attachment relationships (Bowlby, 1988). Attachment is consistently associated with a number of familial experiences, including parenting style, family conflict, marital satisfaction, and intimate partner violence (Liotti, 2004; Sutton, 2019). Change to the family structure is another example, with approximately 10–14% of children between the ages of three and eleven years experiencing family instability in a UK sample (Zilanawala et al., 2019). This has long been an area of interest within child development research, although the way in which it is defined varies considerably. As highlighted by Zilanawala et al. (2019), whilst 'family structure' is one way of operationalising changes in a child's immediate family environment, 'environmental confusion', 'family instability', 'disruptions in multiple domains, including household resources and routine family life', and 'sudden, unexpected, and unintended disruptions' are others. Indeed, recent work has recognised the impact of structural change during a child's upbringing, with dynamic family arrangements predicting later emotional distress (Cavanagh, 2008) and the departure of the father being positively associated with anti-social behaviour (Mitchell, 2013). Moreover, acknowledging the temporal dimension of such changes, the Millennium Cohort Study (Zilanawala et al., 2019)

showed that multiple family environment changes over time predict more internalising and externalising behaviours (whereby the emotional response is directed inwardly and towards oneself, or outwardly and towards others, respectively). In this context, it could be argued that family instability may be particularly relevant in terms of understanding what may drive disruptive behaviour in the classroom.

However, in a review of the literature, Graham et al. (2019) highlighted that drivers of school exclusion are complex and there is potential for various inter-related risk factors to intersect and overlap to create a "multiplier effect" (Gill et al., 2017). Thus, whilst the pathways are complex, it is reasonable to propose that, in many cases, 'persistent disruptive behaviour' is reflective of unrecognised or unmet needs (Paget et al., 2018) 'below the surface'. Indeed, rather than schools meeting the individual needs of its pupils, children and their families are often blamed for 'not fitting in' to school processes, and this often gives way to the attachment of unhelpful labels to child's behaviour (Carlile, 2011). For example, in a review of qualitative research into the experiences of excluded children, Apland et al. (2017) found that excluded children were often described as 'bad' or 'naughty', with a tendency for these labels to remain with them throughout their school career. Whilst some pupils understood how their behaviour had culminated in exclusion, others felt they had been disadvantaged and treated unfairly. Similar findings were reported by Levinson (2016) in their exploration of the experiences of staff and pupils at a Pupil Referral Unit (PRU). Pupils felt that once deemed to be 'troublemakers', their educational prospects had deteriorated.

Consequently, the evidence suggests that exclusion will have no beneficial impact on a pupil's ability to engage with the system; difficulties will persist so long as needs go unrecognised. This points towards the importance of better understanding children's needs - and at a much earlier point in time.

Special Educational Needs. As a specific area of 'need', presence of special educational needs and disabilities (SEND) is also highlighted in the literature as a key risk factor for school exclusion (Graham et al., 2019; Cole et al., 2015; Gill et al., 2017). 'SEND' functions as an umbrella term to capture the specialist needs of pupils who face educational challenges as a result of learning, sensory or physical difficulties or disabilities, and/or from social, emotional and mental health needs (Graham at al., 2019). Children with SEND are disproportionately excluded from

school, irrespective of whether their needs are less complex and necessitating of in-house 'SEND support', or more complex and meeting the threshold for more comprehensive support through an Education, Health and Care plan (EHCP) (Graham et al., 2019). Indeed, national statistics show the permanent exclusion rate for SEND pupils with an education, health and care (EHC) plan (detailing SEND support) to be 0.15, and 0.32 for pupils with SEND and no EHC plan - compared to 0.06 for those without identified SEND (Department for Education, 2021). Such findings are also reflected in the outcomes from the Avon Longitudinal Study of Parents and Children (ALSPAC), one of the few existing studies of exclusion in a UK birth cohort, using large-scale data (n=14,541) and a range of measures to profile the children and young people excluded from school (Paget et al., 2018). Logistic regression models found exclusion by 8 years to be positively associated with the presence of SEND (amongst other factors) and 'psychiatric disorder and social communication difficulties' were identified as a significant risk factor for exclusion at both age 8 and age 16 years.

Indeed, Nye et al. (2016) found that children with identified SEND, where emotional and behavioural needs were apparent, were not only at risk of poorer outcomes individually, but were also perceived as a challenge for mainstream schools. Given the lack of understanding around drivers of 'disruptive' behaviour and the apparent conflation of 'vulnerable' with 'naughty', it may be argued that children with SEND account for an ever larger proportion of permanent exclusions than is recognised, with the needs of many going 'under the radar'.

Autism Spectrum Disorder, School Exclusion and NEET. Exclusion rates for children with SEND vary by type of need. For example, children with Autistic Spectrum Disorder (ASD) are particularly vulnerable to being excluded from school (Autism Education Trust, n.d.). Under the umbrella of SEND, ASD is a neurological and developmental disorder affecting the way in which an individual experiences and makes sense of the world. A diagnosis is based on a multi-disciplinary assessment of observable behaviour and developmental history. As stipulated in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), a diagnosis is based on observation of difficulties with social communication and interaction, along with restricted interests and repetitive behaviours. Moreover, these difficulties should be present across contexts, and generally become apparent in the child's early years.

Recent evidence for the link between ASD and school exclusion (building on the findings from Paget et al., 2019), comes from a retrospective cohort study of children aged 7-16 years in state-funded schools in Wales (John et al., 2022), where attendance and exclusion data were linked to national demographic and healthcare datasets (n=414,637). Pupils with a recorded diagnosis of ASD (along with other neurodevelopmental or recognised mental health difficulties) were identified, and statistical analysis revealed that this cohort were more likely to be excluded from school than peers without a recorded diagnosis. Furthermore, students with ASD (n=486) have been reported as missing over a fifth of school days each month on average, with school exclusion accounting for 9% of this absence (Totsika et al., 2020).

Individuals with a neurodevelopmental condition are also at increased risk of NEET compared to their 'neurotypical' counterparts. Ringbom et al. (2022) explored data from the Finnish Birth Cohort study (n=55,273) and found significant associations between NEET and various neurodevelopmental conditions, with ASD yielding the highest effect size (OR = 17.3, 95% CI 11.5–26.0). Additionally, over two thirds of those who left school early and had an ASD diagnosis later became long-term NEET. Though the reason for leaving school early was not documented, findings demonstrate clear links between ASD, educational disadvantage, educational disengagement (such as school exclusion) and poor longer-term outcomes.

Qualitative studies have identified various factors that autistic children and their families felt had contributed to their exclusion from school. These included the school environment (relating to sensory needs and unpredictability), interpersonal difficulties (including bullying and the demands expected in a large mainstream classroom), lack of staff understanding regarding the child's needs, lack of appropriate support and subsequent failed attempts to manage 'problematic behaviour' (Brede et al., 2017; Sproston et al., 2017). Ultimately, Merry (2020) captured these themes in their discussion of "the price of inclusion for children with autism" in mainstream schools; the current system has considerable physical, psychological, social and educational detriments for children expected to 'fit in' to a system not designed to meet their needs.

Access to (Un)Timely Support: A Broken System

Educational Barriers. From an educational perspective, schools are not well-equipped to identify and effectively meet the needs of children with SEND, including ASD. This is reflected in an analysis of exclusion-related calls from parents to their legal advice service, whereby 80% of the children involved had either suspected or diagnosed SEND (Coram Children's Legal Centre, 2016). Parents often felt that schools were not providing adequate support to their children, having been advised, for example, that it was too early to assess the child. The Children's Commissioner (2013) also found that some schools were unable to provide the support set out in EHCPs and were not allowing children to attend school on the basis that staff were unable to meet their needs.

Martin-Denham (2021) carried out interviews with headteachers to understand their approaches to recognising underlying causes of social, emotional and mental health difficulties (including behaviour that challenges). In line with the aforementioned findings, the study illustrated a sense that children were not coping in school due to lack of timely identification of their needs. Indeed, without the right support at the right time, children are more likely to engage in behaviour that challenges. In turn, this may increase the risk of school exclusion (Martin-Denham, 2020; 2021; Pirrie et al., 2011).

However, Power and Taylor (2019) discuss the way in which government policies push schools to be 'inclusive' in the absence of any adequate resource**.** Recommendations have followed numerous national reviews, including the Bercow Report (Department for Children, Schools and Families [DCSF], 2008); the Lamb Inquiry (DCSF, 2009); the Salt Review, (DCSF 2010) and the Timpson Review (Timpson et al., 2019). Nevertheless, schools continue to be unsupported with regards to the early identification and intervention of children's needs, equipped only to observe behaviour at a visible, surface level – the 'tip of the iceberg' (Holttum, 2015; White et al., 2013; Martin-Denham, 2021).

Indeed, qualitative studies suggest speak to the lack of support available to school staff to empower them to manage such complexity in any effective, meaningful way (Kulz, 2015). Specifically, as discussed by Martin-Denham (2021), schools' inabilities to identify children's needs in sufficient time has been linked to a lack of time to explore drivers of behaviour (Hastings & Brown, 2002; Golder et al., 2009; Hodkinson, 2009; Kulz, 2015), as well as limited staff training, knowledge and expertise (Department for Education, 2015; 2018; Driver Youth Trust, 2015;

Kulz, 2015); in some cases, parents felt that this had contributed to their child's school exclusion (Kulz, 2015).

Moreover, current practices are variable and unreliable. For example, not all children with SEND may be registered (Martin-Denham, 2021); Horridge (2019) suggests that the children most likely to receive the right support, at the right time, are those whose needs are more clearly visible. Relatedly, in identifying children's needs, some teachers rely more on a "gut feeling" rather than the SEND register, with schools attempting, instead, to "piece parts of the jigsaw together" (Martin-Denham, 2021). However, whilst the identification of children with SEND is typically reliant on the immediate perceptions of school staff, it should also be acknowledged that this perception is constructed upon the various structural inequalities that persist within society (Dyson & Gallannaugh, 2008). For example, studies have found ethnic disproportionality in the prevalence of students with SEND, with significant over- and underrepresentation of some ethnic minority groups (Strand & Lyndsay, 2009). Furthermore, SEN continues to be more prevalent in boys and in pupils eligible for free school meals (Department for Education, 2022b), highlighting the roles of both gender and socioeconomic status.

Critically, schools do not have access clear guidance to enable identification of SEND and neurodevelopmental needs in an accurate, timely manner - though arguably, this is the only way to accurately recognise, describe, document and respond to children's needs effectively (Horridge, 2019).

Problems with a Diagnosis-Led Model. Designed to formalise the support that is provided, an education, health, and care plan (EHCP) is a document created by schools in conjunction with parents and other professionals, yet is often contingent on a diagnosis (Martin-Denham, 2021). However, neurodevelopmental assessment services are plagued with long waiting lists and an increasing number of children and young people (CYP) are not receiving timely care. Thus, when a clinical diagnosis of ASD is not easily accessible, potential support and reasonable adjustments in school are even less likely to be implemented (Dockrell et al., 2019). Moreover, given systemic inequalities in service access, unmet neurodevelopmental needs interact with familial adversity, exacerbating the challenges faced by the children with neurodevelopmental needs.

Whilst it could be argued that reducing waiting lists would allow for more timely and effective support, the process remains problematic; assessment and

diagnosis is currently reliant on information often held and interpreted exclusively by clinical services, when intersecting and interacting data are also recorded across multiple other systems (including education). Moreover, John et al. (2022) found that formal SEN status reduced the likelihood of being absent or excluded (particularly for children with a diagnosed neurodevelopmental condition), compared with those with a recorded diagnosis but no SEN status. This suggests that a diagnosis of ASD alone does not necessarily trigger the required supportive intervention needed in school, and highlights the potentially positive impact of educational intervention.

Clearly, current systems and practices within health and education limit the provision of effective, timely, in-school support for children and young people with a neurodevelopmental condition. The literature demonstrates the need for a more unified, connected approach to empower schools to identify children's needs at a much earlier time point and to mitigate the development of harmful sequalae. As suggested by John et al. (2022), integrated school-based and health-care support is paramount. However, there is a need for a population level, place-based approach to clearly document the current landscape.

The 'place' in which this project is focused, Bradford is a vibrant and diverse city in the North of England, stretching from the city centre to the outskirts of the Yorkshire Dales as the fifth largest authority in the UK (City of Bradford Metropolitan District Council, 2022). Bradford is home to a multi-cultural population of approximately 500,000, with individuals of ethnicities other than White British making up approximately 40% of the total population (Office for National Statistics, 2022). The district is home to the second largest proportion of people of Pakistani ethnic origin (25.5%) in England (City of Bradford Metropolitan District Council, 2022).

Whilst being the youngest city in the UK, with over 28% of its population under 10 years old (Office for National Statistics, 2022), Bradford is also ranked as the fifth most income-deprived local authority in the UK (City of Bradford Metropolitan District Council, 2020). As a social mobility 'cold spot', the Department for Education established Bradford as one of twelve 'Opportunity Areas' (OAs). The Bradford OA partnership board continue to focus on demonstrating that factors outside the school gates are critical determinants of educational outcomes, using whole system approaches to tackle the complexities of

social mobility. As a key part of this, the Centre of Applied Educational Research (CAER) was created, based within the Bradford Institute for Health Research (BIHR) and serving as a forum for organisations to connect and utilise evidence to drive positive change (Centre for Applied Education Research, n.d.). This project was completed in collaboration with CAER.

Current Aims

Using the Connected Bradford dataset (Sohal et al., 2022), this study brings together, for the first time in England, routine administrative data from health and education services for 600,000 citizens to address the research question: 'What is the relationship between ASD and school exclusion?'. Two analyses were conducted. The first explored patterns of exclusion on a year by year basis, while the second aimed to compare the patterns of exclusions observed within primary school years (4-11 years old) compared to secondary school years (11-16 years old). The following hypotheses were generated:

1. Historic rates of exclusion will be higher in secondary school than primary school;
2. Historic rates of exclusion will be higher when pupils have a pending diagnosis, relative to those with a confirmed diagnosis.
3. Historic rates of exclusion will be higher when pupils have no diagnosis, relative to those with a confirmed diagnosis.

A Pragmatic Approach

The overall study was underpinned by the theoretical assumptions of pragmatism, whereby researchers employ the philosophical and/or methodological approach that most effectively answers the research question (Tashakkori & Teddlie, 2021). Pragmatists doubt that reality can ever be determined once and for all and believe therefore that philosophical debates are unsolvable (Dillon et al., 2000). In this context, scholars have highlighted the importance of not viewing pragmatism as a philosophical position, but as a set of philosophical tools for addressing real world, genuine and practical problems (Tashakkori & Teddlie, 2021) and generating practical knowledge that can be utilised to make important differences in society (Goldkuhl, 2012; Maxcy, 2003). Pragmatism is therefore a highly appropriate lens for the area of research investigated in the current study.

Analysis 1

Method

   Study Setting and Participants. This was a retrospective data linkage study. Data were collated from the Connected Bradford database; a linked database for over 800,000 citizens across the Bradford district in West Yorkshire, United Kingdom (Sohal et al., 2022). Data were collated from primary care records and Department for Education (DfE) data which covered the school census and reported exclusions.

   Inclusion criteria were individuals appearing in both the DfE census and the Bradford Primary Care datasets between the academic years 2005 and 2019. Before 2005, there were substantially fewer reported exclusions in the DfE data suggesting there to be changes in the reporting of exclusions pre- and post-2005. Consequently, to prevent the validity of the analysis from being compromised, data collected prior to this date year were excluded. As a large proportion of the individuals in the cohort had missing data for one or more of the years of their compulsory education (Reception to Year 11), only individuals with all available years of education at either the primary, secondary or both levels of education were included in the cohort. All years of compulsory education for each person were included.

   Variables.

   Exclusions. Children were categorised as being excluded if their records reported one or more instances of an exclusion (temporary or permanent) during the academic year in question. If a child was excluded, they were marked as "excluded - yes"; otherwise, they were marked as "excluded - no". In instances where there were multiple exclusions on a child's record, only the first exclusion was considered and included in analysis. These data were obtained from the absences data within the DfE dataset.

   ASD Diagnosis. A list of relevant SNOMED-CT codes were created to identify individuals with autism spectrum diagnoses within the Primary Care data. Autism spectrum was coded in SNOMED-CT as "Pervasive Developmental Disorder, SCTID: 35919005" ("Autism Spectrum Disorders" are listed as a secondary preferred term under this code). There were found to be 49 descendant conditions of this code which were also used to indicate autism spectrum diagnosis. Only children with relevant SNOMED-CT codes were included in subsequent analyses. An "age at diagnosis" variable was also created reflecting the date the first

autism spectrum diagnosis code appears in an individual's records. Individual academic years of compulsory education for each individual were observed. If no code was recorded, individuals were categorised as not having a diagnosis. If one or more of the relevant codes for ASD were recorded, individuals were categorised as either "pending diagnosis" or having a "confirmed diagnosis" for that academic year, depending on when their diagnosis had been made. The date at which the first ASD SNOMED code appears on an individual's records was used as a proxy for diagnosis date as date of diagnosis is not explicitly recorded within the Primary Care data. A child who was diagnosed more than six months before the start of the academic year in question was considered to have a "confirmed diagnosis" for that academic year. Conversely, a child who was diagnosed after, or less than six months before the start date of the academic year in question, was considered to have a "pending diagnosis" for that academic year. While this six month cut-off is relatively arbitrary, this period allows time for schools to put into place adjustments to accommodate an individual's needs, as identified by their diagnosis. Prior to this six month period, it is reasonable to assume that a child may not have received enough support to positively impact their behaviours in the classroom.

Ethics. The project was conducted under the governance of the Bradford Institute for Health Research. The data were provided by the citizens of Bradford and district, and collected by the NHS and other organisations as part of their care and support. HRA CAG and ethical approval was granted by the Leeds Bradford Research Ethics Committee for Connected Bradford (IRAS ref: 239924; CAG ref: 18/CAG/0091 and REC ref: 18/YH/0200). The later qualitative exploration was part of a larger programme of research on autism pathways (IRAS ID: 227117; REC reference: 17/EM/0254, IRAS ID: 290135; REC reference: 20/YH/0314) and was part of a clinical audit approved by the Bradford Teaching Hospitals NHS Foundation Trust (IRAS Number: 233328).

Results

  Initial explorations revealed a clear change in the pattern of exclusions between the years of primary education (Reception to Year 6) and secondary education (Years 7 to 11). Table 1 (overleaf) shows the total counts and proportions of exclusions and ASD diagnoses by academic year.

Table 1

School Exclusion Counts and Percentages for the Cohort by Academic Year

Academic Year	Total	ASD Diagnosis (%)			Excluded (%)
		None	Pending	Diagnosed	
R	70235	68856 (98.04)	1290 (1.84)	89 (0.13)	59 (0.08)
1	70012	68648 (98.05)	1205 (1.72)	159 (0.23)	140 (0.2)
2	69964	68607 (98.06)	1129 (1.61)	228 (0.33)	172 (0.25)
3	69934	68584 (98.07)	1064 (1.52)	286 (0.41)	319 (0.46)
4	69940	68590 (98.07)	991 (1.42)	359 (0.51)	494 (0.71)
5	69936	68581 (98.06)	921 (1.32)	434 (0.62)	681 (0.97)
6	69959	68603 (98.06)	835 (1.19)	521 (0.74)	954 (1.36)
7	84632	83537 (98.71)	700 (0.83)	395 (0.47)	2849 (3.37)
8	84664	83565 (98.7)	624 (0.74)	475 (0.56)	4433 (5.24)
9	84574	83477 (98.7)	555 (0.66)	542 (0.64)	5343 (6.32)
10	84800	83704 (98.71)	477 (0.56)	619 (0.73)	6128 (7.23)
11	84673	83571 (98.7)	419 (0.49)	683 (0.81)	4494 (5.31)

Note. Percentages for ASD diagnoses and exclusions are reported as a percentage of the yearly cohort.

Exclusions in the primary years followed a slowly increasing trajectory. In the secondary years, the rate of exclusion increased sharply, reaching a peak in Year 10 and then falling in Year 11. Unsurprisingly, confirmed diagnoses increased over the years of education with a corresponding decline in pending diagnoses.

Figure 1 shows that students with pending diagnoses had a consistently higher rate of exclusion than those with either a confirmed diagnosis of ASD, or no diagnosis at all. However, in Years 10 and 11, the rates for those with pending diagnosis and those with no diagnosis were very similar.

In primary school, the rate of exclusion was higher for students with an ASD diagnosis compared to those with no diagnosis. At the start of secondary school (Year 7), rates were the same for students with a confirmed diagnosis, and students with no diagnosis. After this point, rate of exclusion for those with a confirmed diagnosis fell below the rate for those without a diagnosis.

Figure 1

Proportions of Cohort with an Exclusion by Academic Year Subdivided into ASD Diagnosis Status. Blue line represents pupils with a confirmed diagnosis; orange line represents pupils with a pending diagnosis; grey line represents pupils with no diagnosis.
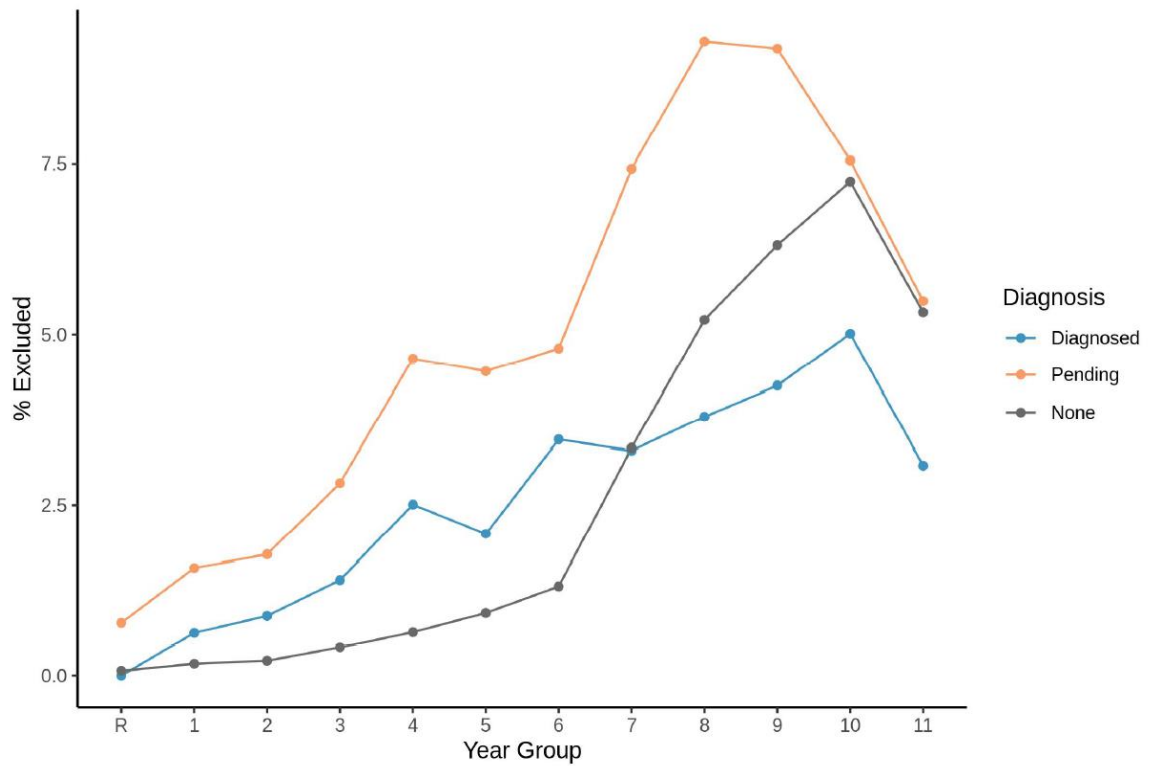
Analysis 2

Method

The study setting and participants were identical to Analysis 1.

Variables.

Exclusions. This variable was derived from the DfE records, based on the presence of one or more instances of an exclusion (temporary or permanent) across all years of primary schools, and then across all years of secondary school. If a child was excluded at any point in primary school, they were marked as "excluded - yes", otherwise, they were marked as "excluded - no" (for the primary school period). Similarly, if a child was excluded at any point in secondary school, they were marked as "excluded - yes", otherwise "excluded - no" (for the secondary school period). In instances where there were multiple exclusions on a child's record, only the first exclusion was considered and included in analysis.

ASD Diagnosis. As with Analysis 1, SNOMED-CT codes were used to identify individuals with ASD within the Primary Care data.

For children who had never been excluded, the assignment of a status was relatively simple. If no SNOMED code associated with ASD was ever recorded in a child's academic record, they were categorised as not having a diagnosis ("none"). If a child had a "pending diagnosis" for all years within a period (primary or secondary), they were given a "pending" status for that period. If a child was diagnosed at any point within a session, they were assigned a "diagnosed" status for that period. For example, if a SNOMED code associated with ASD appeared on a child's record when they were in Year 8, and they had never been excluded, the child would be assigned a "pending" status for the primary school period, and a "diagnosed" status for the secondary school period.

For children who had been excluded at some point, the assignment of status was slightly more complex. While individuals who were never recorded as having ASD were still assigned a status of "none", the assignment of a "pending" or "diagnosed" status depended on when the SNOMED code associated with ASD first appeared within the child's records. An excluded child was categorised as having a "pending" status if, at the point of exclusion, or up to six months before, there were no relevant SNOWMED codes on their record, but they did receive a diagnosis at some point after they were excluded (even if it was later in that same period). If the child had received an ASD diagnosis more than 6 months prior to the point of

exclusion, they were assigned a "diagnosed" status for that period. For example, if a SNOMED code associated with ASD appeared on a child's record when they were in Year 8 and they were excluded in Year 10, they would have a "pending" status for the primary school period, and a "diagnosed" status for the secondary school period. However, if that child had not been diagnosed until Year 11, their status in secondary school would remain as "pending".

Statistical Analysis. Logistic regression was conducted to model the relationship between ASD diagnoses and the likelihood of exclusion. As rates of exclusion are higher in secondary schools compared to primary schools (DfE, 2023), two separate models were proposed: a "primary school" model (including only the exclusions recorded for each individual from Reception to Year 6), and a "secondary school" model (including only the exclusions recorded for each individual from Years 7 to 11).

Results

Overall rates of exclusion were higher in secondary school (16.3% of students excluded) than in primary (2.61% of students excluded). Data for the primary and secondary school periods can be seen in Table 2 and match trends observed in Analysis 1 (Figure 1).

Table 2

School Exclusion Counts from Primary and Secondary Datasets Subdivided by ASD Diagnosis Status and Exclusions

	ASD Diagnosis	Excluded (%)		Total
		No	Yes	
Primary	None	66906 (97.54)	1686 (2.46)	68592
	Pending	746 (86.44)	117 (13.56)	863
	Diagnosed	473 (95.94)	20 (4.06)	493
	Total	68125 (97.39)	1823 (2.61)	69948
Secondary	None	69930 (83.71)	13613 (16.29)	83543
	Pending	331 (72.43)	126 (27.57)	457
	Diagnosed	582 (91.22)	56 (8.78)	638
	Total	70843 (83.70)	13795 (16.30)	84638

Note. Proportions are reported as those observed as excluded yes/no as a percentage of the ASD diagnosis subgroup.

In both primary and secondary school, students with pending ASD diagnoses had the highest rates of exclusion (primary= 13.56%; secondary= 27.57%). When considering only those in primary school, a higher percentage of students with a confirmed diagnosis of ASD were excluded compared to those without an ASD diagnosis (4.06% and 2.46% respectively). Conversely, in secondary school, a lower percentage of those with a confirmed diagnosis were excluded (8.78% compared to 16.29% for those without a diagnosis).

Focussing on the primary school period, a univariate logistic regression demonstrated that students with a pending diagnosis had over six times increased odds of being excluded compared to their peers without a diagnosis (OR = 6.22 [95% CI 5.09, 7.61], p<.001). Students with a confirmed diagnosis had nearly two times increased odds of being excluded compared to their peers without a diagnosis (OR = 1.68 [95%CI 1.07, 2.63], p<.05).

Similarly, when focussing on the secondary school period, a univariate logistic regression demonstrated that students with a pending diagnosis had nearly two times higher odds of exclusion compared to their peers without a diagnosis (OR = 1.96 [95%CI 1.59, 2.40], p<.001). However, students with a confirmed diagnosis had decreased odds of exclusion at secondary level when compared to peers with either a pending diagnosis or no diagnosis at all (OR = 0.49 [95%CI 0.38, 0.65], p<.001).

Discussion

Overall Discussion of Findings

Analysis 1. For the first time in England, school exclusion data were linked with routine administrative healthcare data to understand the relationship between ASD and school exclusion. Overall, analysis 1 illustrated some clear trends across the years of compulsory education (Reception to Year 6). Mirroring national statistics (Department for Education, 2021), a difference in rates of exclusion between primary and secondary school was clear and also evidenced in analysis 2; confirming the **first hypothesis**, the odds of exclusion were significantly higher in secondary school than primary school, echoing findings from John et al. (2022).

The overall rate more than doubled between Year 6 to Year 7 at the point of transition from primary to secondary education, with a particularly sharp increase apparent for those with a pending diagnosis. From an acute perspective, transition, change and unpredictability alone are known to be experienced as difficult for individuals with ASD. However, from a wider perspective, the transition from primary to secondary school typically entails a significant reduction in the level of structured support received, combined with the experience of additional social and environmental demands (Brede et al., 2017; John et al., 2022; Sproston et al., 2017). Indeed, the nurturing primary school environment may be protective for children with a neurodevelopmental condition and the slow increase in rates of exclusion across the primary years may also be reflective of this. Yet, arguably, this

automatically places this group of children in a position of significant disadvantage post-transition (Menzies & Baars, 2015), where "the price of inclusion" (Merry et al., 2020) is (too) high. The elevated rates of exclusion seen at the secondary school level may therefore be explained by increased distress, manifested as behaviour perceived by school staff as naughty, challenging (Apland et al., 2017; Nye et al., 2016), or 'persistently disruptive' (Department for Education, 2021), and therefore increasing risk of exclusion.

It is also noteworthy that at the point of transition, the rate of exclusion for those with a confirmed ASD diagnosis falls lower than the rate for peers with no diagnosis, thus the **third hypothesis** cannot be rejected. This suggests that whilst the cohort with diagnosed ASD may be relatively supported in secondary school, there is clearly another group of vulnerable children whose behavioural difficulties are underpinned by other unmet needs, i.e. those not (necessarily) related to a neurodevelopmental condition. Indeed, links between exclusion and a myriad of other vulnerabilities are well-documented in the literature (e.g. Cole et al., 2015; Paget et al., 2018; Quilter-Pinner & Gill, 2020). However, this finding should also be considered in the context of systemic inequalities in service access, whereby potentially unidentified neurodevelopmental needs interact with familial adversity, exacerbating the challenges faced by children with complex backgrounds and potentially blurring the picture of their needs (Berg et al., 2016; 2018; Moran, 2010; Russell et al., 2011). In this regard, it is possible that the needs of many excluded, undiagnosed children have been misunderstood, missed entirely, or identified too late. This points towards the importance of schools offering needs-led support, across a whole spectrum of need, rather than support being reliant on a clinical diagnosis.

The overall rate of exclusion peaked in Year 10 before falling in Year 11, again mirroring national statistics (Department for Education, 2021). However, upon closer investigation, the peak varied with diagnosis status. The rate for pupils with a pending diagnosis peaked higher (in line with **second hypothesis**), and earlier, in Year 8. This suggests that the impact of a pupil's neurodevelopmental needs being unmet is greatest in their early secondary school years, perhaps reflective of the acute accumulation of stress associated with trying to adjust to the demands of secondary school.

Conversely, the rate for pupils with a confirmed diagnosis peaked lower and later (Year 10). On one hand, this suggests a positive impact of having a confirmed diagnosis; this may serve a protective function, allowing for adjustments to be made to create a more inclusive and accessible classroom experience for children with a neurodevelopmental condition. On the other hand, the finding that exclusion rates for this group continued to increase up until the penultimate year of compulsory education highlights the need for more effective intervention at a much earlier time point. This is particularly important in the context of findings from Ringbom et al. (2022) suggesting that individuals with neurodevelopmental needs are at increased risk of NEET compared to their neurotypical peers; it is reasonable to argue that exclusion towards the end of the secondary school period would increase a pupil's risk of NEET and poor long term outcomes, given the limited time for alternative solutions or provisions to be arranged and implemented. In line with findings from John et al. (2022), this also suggests that diagnosis alone does not necessarily translate into supportive intervention for children with a neurodevelopmental condition; it may be that schools need other frameworks or guidance to effectively meet the needs of this group. Indeed, it is well-documented that currently, schools are not well-equipped in this regard (Coram, 2016; Children's Commissioner, 2013; Martin-Denham, 2021).

Analysis 2. Analysis 2 built on the findings from analysis 1. In common with analysis 1, pupils with a pending diagnosis had the highest odds of exclusion (compared to those with a confirmed diagnosis, or no diagnosis at all) at both primary and secondary school level, offering further support for the **second hypothesis**. Compared to those without a diagnosis, the odds increased sixfold in primary school, and almost doubled in secondary school. This key finding suggests that schools are not equipped to identify and meet the needs of children with a neurodevelopmental condition who are yet to receive a diagnosis. Once more, the findings highlight the reliance of schools on a clinical diagnosis, as discussed by Martin-Denham (2021). Similarly, Dockrell et al. (2019) demonstrated that children with a diagnosis of ASD were more likely to receive support from schools, independent of factors such as behaviour. The current findings support the same notion that diagnosis-led provision curtails the effective support of children with a neurodevelopmental condition and points towards the inequitable and untimely allocation of resources for this group (Dockrell et al., 2019). In the absence of the

right support at the right time, children with neurodevelopmental needs are more likely to engage in behaviours that challenge, contributing to disruptions in their education and increasing the risk of school exclusion (Martin-Denham, 2020; 2021; Pirrie et al., 2011).

Matching the trend observed in analysis 1, the **third hypothesis** (that rates of exclusion would be higher when pupils have no diagnosis, relative to those with a confirmed diagnosis) was only partially confirmed in analysis 2 due to differences found between primary and secondary school. Pupils in *secondary* school with a confirmed diagnosis had lower odds of exclusion than those with either a pending diagnosis or no diagnosis at all. This finding sits in contrast to others in the literature (e.g. Paget et al., 2018, John et al., 2022). However, this logically follows on from the above, suggesting that a diagnosis supports (secondary) schools to make adjustments to meet children's neurodevelopmental needs.

Conversely, the opposite was true for *primary* schools where the odds of exclusion for pupils with a confirmed diagnosis were nearly double the odds for peers with no diagnosis (but still lower than the rate for peers with a pending diagnosis). This may be explained by the fact that in a child's changing developmental profile their early years means that difficulties with social communication and interaction may not appear to be problematic until they begin school, where their capabilities might then become exceeded by the demands of the school environment. In this context, it is possible that a significant proportion of the children excluded from primary schools are those whose needs would always have been better met in special education – regardless of their already confirmed diagnosis of ASD. However, this finding does offer some support to other studies reporting that pupils aged 7-16 years with: (i) a recorded diagnosis of ASD (John et al., 2022); (ii) 'presence of SEND' at age 8; or (iii) 'psychiatric disorder and social communication difficulties' at 8 or 16 years (Paget et al., 2018), were more likely to be excluded than those without a recorded diagnosis. In combination, these findings suggest that schools require more than just a diagnosis to meet the needs of children with a neurodevelopmental condition, and that current practices do not sufficiently equip teachers with the requisite skills (Children's Commissioner, 2013; Coram Children's Legal Centre, 2016; Martin-Denham, 2021).

Implications for Policy and Practice

The findings echo the narrative in the literature that pupils with a neurodevelopmental condition are not receiving the right support in a timely manner. The (very limited) support schools are currently able to provide is contingent on a formal, clinical diagnosis, yet waiting times for a neurodevelopmental assessment are lengthy. With their needs unidentified and unsupported, children with neurodevelopmental needs are likely to communicate their increasing levels of distress through behaviour which, poorly understood, attracts negative labels in school and increases the risk of exclusion. In this context, the significantly high rate of exclusions for pupils with a pending diagnosis of ASD indicates that **the current diagnosis-led model of support is not optimal.** Instead, it is reasonable to argue that **schools require additional tools and guidance to identify and meet the needs of children in-situ, without reliance on clinical services.**

The results also suggest that **more support is required *prior* to transition** for children who demonstrate a range of behavioural difficulties. Whether such difficulties are reflective of a queried neurodevelopmental condition, or a response to adversity or familial factors for instance, **the importance of being led by *need* as opposed to diagnosis (or lack of)** is clearly indicated. This may entail specific preparatory efforts in Year 6, along with good co-ordination and linkage between key primary and secondary school staff to facilitate a 'joined up' transition. In turn, this may empower vulnerable children, particularly those not *yet* identified as having a neurodevelopmental condition, to navigate and manage the demands associated with secondary school. It is anticipated that this may reduce levels of distress and therefore reduce the likelihood of behaviours that may increase the risk of exclusion.

The findings also suggest that even **a confirmed diagnosis does not necessarily translate into children receiving the right support at the right time**; a confirmed diagnosis (compared to no diagnosis) increased the odds of exclusion in primary school, and rates for this group only began to fall in the penultimate year of secondary school. **Once more, this implies that schools need much more than a diagnosis to be able to meet the needs of pupils with a neurodevelopmental condition.** The findings highlight a need to **provide support at a much earlier time point** given the elevated risk of NEET for this group, to reduce the risk of pupils becoming disengaged from education in a period so critical to their future.

Limitations

The use of real word data creates several limitations for the study. For example, the data were reliant on clinical diagnostic information and formal school records, and were therefore not inclusive of the experiences of children whom had not yet had contact with neurodevelopmental assessment services, or whose exclusion had gone unrecorded. Consequently, underestimation or overestimation of the prevalence and impact of ASD and exclusions in the cohort is possible. Similarly, individual differences such as gender, ethnicity, or possible comorbidities such as ADHD or learning disability, may have mediated or moderated the effect of ASD status on exclusion likelihood.

Moreover, the analysis only considered an individual's first exclusion, raising questions about the trends that may have been observed amongst individuals who had been excluded more than once. Relatedly, both permanent and temporary exclusions were included in the analysis. However, as discussed by Paget et al. (2018), permanent exclusions are usually preceded by temporary exclusions, thus it can be reasonably assumed that both are reflective of similar trajectories of educational disengagement.

Finally, use of quantitative, observational data meant that relationships between ASD status and exclusion likelihood were not established; the analysis did not offer an understanding of the underlying mechanisms or processes that led to exclusions. Indeed, there is a dearth of research into the perspectives of students with a neurodevelopmental condition on classroom behaviour (Roberts et al., 2016), resulting in a limited understanding of which aspects of the school environment are experienced by as particularly challenging.

Despite such limitations, it is reasonable to conclude that schools are not equipped to meet the neurodevelopmental needs of pupils in a timely manner and this elevates the risk of school exclusion, particularly for those without a confirmed diagnosis. The findings call for the development of guidance and tools to empower schools to provide the right support at the right time, irrespective of diagnostic status. To build on the findings, future studies might establish which interventions or supports are effective. Through empowering school staff, it is expected that this would mitigate the risk of exclusion and/or maximise the chances of excluded pupils re-engaging with education. Moreover, it may be fruitful to further explore the exclusions data in connection with other datasets available within Connected

Bradford (Sohal et al., 2022). This would allow for a more detailed understanding of the local landscape.

Qualitative Study

Connecting Lived Experiences with Visualisation of Electronic Records (CLEVER).The previous study highlighted the immense potential of connected routine administrative datasets (including education and health), clearly demonstrating relationships between ASD diagnosis and school exclusion. However, traditional approaches to data analytics have relied on the identification of patterns subsequently interpreted through input from domain specific experts, such as clinicians in health services, or teachers in schools. Unfortunately, this approach is not fit for purpose when the complexities of human lives means that data intersects and interacts with multiple services. Information is thus distributed across multiple stakeholders and every domain specific expert will have a strong (implicit) 'prior' that can cause cognitive biases to distort the way information is interpreted, resulting, for example, in a potentially fragmented or narrowly focused picture of a child's needs. Furthermore, in order to develop deeper insights into patterns observable within the data, the routine administrative data must to be calibrated with 'lived experiences'.

The Connecting Lived Experiences with Visualisation of Electronic Records (CLEVER) framework was created as novel methodology to address these issues. The framework combines analysis of population level data, such as that held by health and education, with the information perspective of a stakeholder in order to provide an accurate and holistic picture of the system, empowering policymakers and practitioners to make better informed decisions. The CLEVER framework therefore provides a powerful approach to take advantage of data driven insights, formalise these insights using well established qualitative scientific techniques, and then combine the quantitative and qualitative information in a robust manner.

A Pragmatic Approach: Continued

Pragmatism offers a strong philosophical footing for mixed methods research in the fields of the social sciences (Morgan, 2013). A mixed methods design is not only seen as acceptable, given the importance placed on the research question (Bryman, 2006), but *necessary,* in order to address the question and generate useful findings. For example, Pappas (2017) discusses the way in which mixed methods studies rooted in pragmatism can facilitate the interdisciplinary and cooperative research required to exploring complex, multifaceted systemic issues.

However, despite the clear case for a mixed methods design, there was an initial lack of clarity regarding the way in which the lived experience of others could build on the quantitative data within this study. Relatedly, critics of pragmatism have discussed the limitations of the paradigm's contextual, problem-centred nature, arguing that this creates problems for the identification of social problems; someone who is not directly affected may not necessarily consider them to be problematic and worthy of inquiry (Thompson, 1996). For this reason, the headteacher of a local primary school was consulted to harness their knowledge, experience and expertise in the field. As a board member of the 'Bradford Opportunity Area' group, they are involved in work aiming to understand and tackle the various challenges faced by children and young people in the district. As such, it was felt that they could offer valuable insight into schools' approaches to preventing school exclusion.

Primarily, it was felt that risk of exclusion could be lowered if the child's needs are identified at a much earlier point in time. However, in the context of enabling prediction, the difficulty of operationalising and capturing familial factors, specifically, was discussed. The headteacher stated that schools are primarily working with *behaviour* - the 'tip of the iceberg' - with lesser knowledge about the contributory factors or the capacity to disentangle what plays out the classroom. As a result, rather than excluding children, empowering schools to develop an evidence-based understanding of behaviour – along with the means to support vulnerable children through other, more inclusive means – would be wholly preferable alternative.

In the same vein, the headteacher reflected that the value of using data proactively and for preventative function is only just beginning to be recognised:

"I think we're just at the starting point of being able to… there's a difference between recording something for almost like quality assurance or safety purposes, the minute to minute management of crises or situations... And recording something because it's valuable in terms of establishing a pattern or a risk."

They also reflected that there exists a stark lack of integration and connectedness with regards to the information held by services in relation to

vulnerable children and associated adversity in their lives, and that this is a key barrier to the needs of those children being addressed in a timely, effective way:

> "…think of it as fishing floats or buoys as identifiers. You know, he is carrying a swarm of them, but, but, the the the points, the moments at which those red flags get aligned or connected, they happen at certain sort of career stages in a child's either learning, or crisis."

Their view was that the greater the child's level of need, the more "fraught" communication between services often becomes, whilst the chance of connecting the "red flags" to inform supportive intervention reduces. Whilst the utility of Education and Health Care Plans (EHCP) was acknowledged, they explained that the process of bringing professionals and parents together to develop a holistic picture of the child's needs is particularly challenging, such that EHCPs are relatively rare. Challenges were also identified with regards to inconsistent information recording and lack of an accurate, professional discourse to inform when, why, and which information might need to be captured.

They suggested that a key question would be "how is it that you can use those red flags as pre indicators or risk factors for potential crises further down the line?". They spoke of the utility of a possible resource, "almost like a risk list", that could be "predictive rather than reactive…without it leading to demoralisation". This pointed towards the value of an evidence-based profiling tool that would support schools to develop a better understanding of behaviour that challenges and the needs underlying this, thus empowering them to deliver the right support at the right time. Testing out this notion through engagement with professional groups across the district indicated a clear appetite for such a tool, with the potential for this to be transformative for the system.

Introduction: Part 2

From Problem to Solution

Early Years Foundation Stage Profile (EYFSP). In line with calls for a system-wide approach to predicting and identifying need in a timely manner, Wright et al (2019) conducted a retrospective data linkage study using data from the Born in Bradford longitudinal cohort (n=13,857). The study investigated whether children's

Early Years Foundation Stage Profile (EYFSP) score was associated with a future diagnosis of ASD, testing the feasibility of linking education and health data through the process. The EYFSP is designed to measure a range of educational, socioemotional, communicative and developmental factors (thus covering key features of ASD), scored by the teacher at the end of the reception school year to compare the child's development against expected norms. Prior to the study, a sub score was developed by a small group of expert ASD clinicians, comprising of items chosen from the main diagnostic criteria according to WHO (1992; social reciprocity, language and communication, imagination delays and repetitive and stereotyped patterns of behaviour). Logistic regression revealed that children with a low sub score on the EYFSP were ~50 times more likely to later receive an autism diagnosis than those without a low sub score (scores dichotomised for purpose of analysis). This suggests that the EYFSP may be an effective tool in the identification of neurodevelopmental need, and could lead to earlier intervention to prevent the poor associated outcomes.

Moreover, Atkinson et al. (2022) demonstrated that the EYFSP could also be used to identify individuals who may go on to have special educational needs (SEN) more generally. Binary logistic regression models were conducted to investigate whether a holistic school readiness measure within the EYFSP (the 'good level of development' outcome) predicted SEN status. The measure was highly predictive of SEN status, though appeared to overidentify the number of children 'at risk' (Atkinson et al., 2022). Thus, rather than serving any diagnostic purpose, this suggested that the measure may be a useful *screening* tool to identify children for further monitoring, with findings highlighting the importance of additional observation and use of professional judgement. Ultimately, the study evidenced the potential for a standardised tool to identify the unmet needs not only of children who would meet criteria for SEN (including ASD), but also of children who would not meet the formal or clinical thresholds to warrant intervention.

The Electronic Neurodiversity Profiling Tool (ENPT).

Aims. On the basis of the EYFSP, the Electronic Neurodiversity Profiling Tool (ENPT) was developed to guide teachers and Special Educational Needs Co-ordinators (SENCOs) to more accurately identify the learning and support needs of the child and, from there, to sources of guidance, advice and tools; as the SEND code of practice makes explicit, "the purpose of identification is to work out what

action the school needs to take" (Department for Education, 2014, p. 97). Existing independently of clinical services, the tool does not aim to reduce referral rates. On the contrary, it is expected that demand for clinical services will increase, given that the needs of more children will be identified and acknowledged through school. The tool will not replace a formal, clinical assessment and diagnosis, and this will remain important and valuable to many children. However, regardless of whether or not they are referred for assessment, it is hoped that the implementation of the tool will open up support for children without delay. Moreover, it is expected that children with higher levels of need, such as those who communicate nonverbally or have a particularly heightened sensory sensitivity, for example, will have *already* been recognised by schools. In this context, whilst there may be a myriad of ways through which support for this group might be improved, the tool is not expected to be used to identify such a level of need. Instead, the tool specifically hopes to identify the needs of children with a neurodevelopmental condition who may not clearly meet formal diagnostic thresholds, but may otherwise have been described by others as 'badly behaved' or 'unable to concentrate', for example.***Development.*** The tool was co-developed by researchers and health professionals affiliated with the Centre of Applied Education Research (CAER) and Bradford District Care NHS Trust along with the expertise of Educational Psychologists. The initial version was developed locally on the basis of information derived from a neurodevelopmental screening tool used in the United States. However, concerns were raised regarding its fitness for purpose, with questions surrounding its effective identification of children with a neurodevelopmental condition, fit with the wider literature, and general usability. Subsequently, other readily available tools were reviewed, as outlined below.The Professional Association of Teachers of Students with Specific Learning Difficulties (Patoss) aims to maintain links between professionals working in the field of specific learning difficulties (SpLD), helping people with SpLD in their education by nourishing the professionals who teach, assess and support them. Patoss developed a tool with a diagnostic aim, identifying possible indicators of neurodevelopmental need. However, whilst this included many useful components, the tool did not extend to informing the type of support a child might need in order for them to thrive in the classroom.

Meanwhile, under the SEND local offer in Portsmouth, a Neurodiversity Profiling Tool has now been approved for use across the city. Created primarily by

Educational Psychologists, the tool usefully links observable classroom behaviour with conversations that can take place between teachers, SENCOs and parents in order to meet the needs of children in a more timely way. However, questions were raised around the scientific backing of the tool, the evaluation of the tool, and the way in which conversations would map onto support.

The Electronic Neurodiversity Profiling Tool (ENPT) represents an amalgamation of the above, combined with various elements of the Early Years Foundation Stage Profile (EYFSP).

Functionality. The ENPT exists as a questionnaire in a 'branched' format, thus for some children, fewer questions will be necessary. Staff will be asked to rate the child's abilities in multiple broad areas in line with typical age-related expectations. If need is identified in an area, further questions become available in order to gather more detail and 'pinpoint' the need more specifically. In comparison with the Portsmouth tool, which reportedly necessitated 2 hours of teachers' time, the ENPT will create a much shorter conversation whilst still eliciting rich information to be shared across the system.

Eventually, it is hoped that flagging need will automatically feed into tailored recommendations and sources of support to help the child in the classroom, whether these are 'light touch' adjustments, or more in-depth interventions. It is expected that this will both increase staff's understanding of children's behaviour, and reduce exclusion rates for children with a neurodevelopmental condition.

Future Directions. Given the digital nature of the tool, it is hoped that the information obtained can be linked into a connected dataset (such as Connected Bradford; Sohal et al., 2022) to be shared with other parts of the system as appropriate. For example, every referral made for a clinical assessment could contain valuable information collected by the tool, resulting in significant savings in terms of clinical time and cost, and improved convenience and quality of assessment. In support of this, through an evaluation of a programme designed to support vulnerable families, White et al. (2016) suggested that partnership working could enable practitioners to collaborate more efficiently, minimise duplication between services, and allow data to be shared more securely. This may improve families' experiences of the system whilst supporting children's engagement with school, with the potential to reduce risk of exclusion. Longer term, if the ENPT is

deemed to have retained a sufficient proportion of the EYFSP, the tool may be introduced as an alternative to this for further improved efficiency.

Current Aims

In the context of the disproportionate rates of school exclusion for children with unmet neurodevelopmental needs, this study explored a potential solution to the problem. In order to develop a holistic understanding of the landscape, the study aimed to gain insight into the lived experiences and perspectives from different organisations working towards a shared goal. Specifically, the development and implementation of the ENPT was explored through the different lenses, contexts and standpoints of each stakeholder group. With each bringing a very different set of cultures, priorities and ideas, a myriad of opportunities, barriers and challenges were anticipated with such an innovative way of working.

Given the potential of the ENPT to transform the wider system through national deployment, this study hoped to capture the learning in relation to the way in which stakeholders can interact and work together cohesively to co-produce solutions; it was anticipated that effective co-operation would be a key determinant of the project's success. Importantly, it is expected that the findings will inform the development of similar solutions beyond Bradford, serving as a 'toolkit' for systems shifting towards a more connected way of working. Ultimately, it is hoped that this will allow the needs of children cross-nationally to be met in a more effective, timely way, reducing, in turn, the risk of detrimental outcomes for children, such as school exclusion.

The study therefore aimed to address the following research questions:

1) What are the issues associated with creating an electronic tool to identify children with a neurodevelopmental condition?

2) What are the barriers and opportunities associated with implementing an electronic tool to identify children with a neurodevelopmental condition?

Method

Participants

A total of seven professionals were recruited from the ENPT project. The project was funded by the Centre of Applied Education Research (CAER). Recruitment followed an expert (purposive) sampling strategy given the exploratory nature of the research. Participants were clearly identifiable by virtue of their shared

professional goals, and, all directly involved in the ENPT project, had a high level of knowledge and experience in the subject area. As a result, they were deemed to be the most suited to answering the research questions.

Three different 'groups' of participants were recruited to reflect the diversity in the professions involved in the project. Firstly, representatives for 'Research' involved two Postdoctoral Research Fellows from CAER, along with the Assistant Director for Autistic Children's Services within Bradford District Care NHS Trust. The second group comprised of two Educational Psychologists from the City of Bradford Metropolitan District Council. The third group consisted of two Special Educational Needs Co-ordinators from two separate schools in Bradford.

I was linked to CAER by virtue of my supervisor's senior position in the organisation and wider systems. This enabled smooth contact with participants through email. Whilst I was situated only on the periphery of CAER and only for the purpose of the study, it should be noted that there was, by default, at least some prior relationship between myself, as interviewer, and the two researchers based within CAER.

Procedure

I explained the aims of the study (i.e., to understand the issues, barriers and opportunities associated with creating and implementing the ENPT, situated within the wider context of preventing school exclusion) and obtained verbal, fully informed consent from all participants. Verbal consent was deemed to be sufficient given participants' prior consent and commitment to being involved in the ENPT and related work. Participants were encouraged to ask any questions to ensure researcher and participant reciprocity in the data collection process.

Three interviews were held with each group, each lasting one hour and taking place via online videoconferencing software for convenience. An interview schedule was loosely followed to ensure the study's aims were addressed, though discussions were generally guided by what I interpreted to be meaningful. This meant that the interviews often weaved in and out of different areas of thought. Relatedly, the interviews were semi-structured to allow space for rich individual expression and to allow for reciprocity between the interviewer and the interviewee (Galletta, 2012). This created space for follow-up questions to be asked, tailored to the responses of the participant. Indeed, as described by DeJonckheere and Vaughn (2019), in order to collect quality data, interviews should not adopt a transactional question-answer

approach, but an unfold in a way that allows for iterative interactions to develop. In line with the pragmatist stance, this also allowed the conversation to remain focused in terms of eliciting data relevant to research questions, whilst also offering sufficient space for detailed insights to be collected and the contextual complexities of stakeholders' accounts to be captured.

The interviews were audio recorded and stored in a secure online space, supplemented with my own notes about my experiences, observations and assumptions of each group. Supported by the transcription function within the videoconferencing software, each interview was transcribed verbatim. Due to the nature of the data collected, whereby participants frequently referenced their specific professional viewpoints, anonymisation was neither possible nor appropriate.

Analysis

Thematic analysis (TA) methods are viewed by many as a useful method for exploring individual perspectives, identifying similarities and differences between participants' accounts, and generating novel, often unexpected insights (Braun & Clarke, 2006). In their six phase model, Braun and Clarke (2006) presented TA as an approach to identifying, analysing, organising, describing, and reporting themes found within a data set. However, the authors went on to acknowledge that the model was somewhat incomplete and open to interpretation, with scholars tending to cite the article whilst failing to adhere to the approach, thus the term 'reflexive thematic analysis' was subsequently developed and demarcated from other approaches to TA (Braun & Clarke, 2019).

Reflexive thematic analysis (RTA) sits amongst various methods under the TA umbrella, on a continuum from coding reliability approaches, to codebook approaches, to reflexive approaches (Clarke & Braun, 2021). At one end, coding reliability TA is thought to reflect 'small q' qualitative research (Kidder & Fine, 1987), whereby (post)positivist research values (idealising objective, generalisable, reliable and replicable knowledge) underpin qualitative technique (e.g. Ponterotto, 2005). At the opposite end of the spectrum, RTA exemplifies 'Big Q' qualitative research (Kidder & Fine, 1987), whereby qualitative tools and techniques are situated, instead, within a qualitative values framework which typically views researcher subjectivity as an asset, and meaning and knowledge as partial, situated and contextual (Clarke & Braun, 2021). In this context, RTA is conceptualised as a reflection of the researcher's interpretive analysis of the data, and it is therefore

expected and appreciated that no two researchers will arrive at the same analytic output. Subsequently, accounts of 'accurate' or 'reliable' coding are not pursued, given that the method explicitly rejects the notion of any single, 'correct' answer; instead, reflective and thoughtful engagement with the data and analytic process is emphasised (Clarke & Braun, 2021). For the current study, my supervisor was briefly consulted in relation to the analytic output, though the purpose of this was to sense-check ideas in a reflexive manner, aiming to enrich interpretations of the data, rather than to seek consensus (Clarke & Braun, 2021).

Theoretical Assumptions. With pragmatism granting use of whichever philosophical and/or methodological approach most effectively answers the research question, the analysis took place through the specific ontological lens of critical realism, with the assumption that whilst a single truth exists (ontological realism), it is impossible to directly access (epistemological relativism). Critical realism arguably adopts a pragmatic position, acknowledging that human practices shape how we experience and know reality, giving rise therefore to perspectival and contextual truths (Clarke & Braun, 2021). In this context, critical realism is a highly appropriate theoretical underpinning for RTA, whereby the researchers' own experiences, attitudes and assumptions are explicitly named and form an important part of the analytic process. I have included 'reflexivity boxes' throughout the document to shine a light on decisions and developments that have likely been influenced by my experiences in this regard. Indeed, I engaged with the data through the lens of a Trainee Clinical Psychologist and reflect on my perspective in more depth at the end of this section.

Moreover, given the need to develop a clear, in-depth understanding of a very novel area, a primarily inductive or 'data-driven' analytic approach was adopted to produce codes and themes that solely reflected the content of the data, without use of pre-existing theory or frameworks. It was deemed that this approach would best capture the meanings communicated by participants (Clarke & Braun, 2021). However, deductive analysis was also employed to some degree to ensure that the analysis resulted in themes that offered relevant meaning in the context of the research question. Similarly, semantic coding was prioritised over latent in order to focus on the information communicated by participants at surface-level, though, latent coding was also employed to ensure that I could interpret any level of meaning deemed relevant to the research question.

Ultimately, the theoretical flexibility of RTA facilitated a pragmatic approach to answering of the research questions. RTA paved the way for of a rich, in-depth understanding of the data, where meaning could be built up from the data and researcher subjectivity could be used as an asset, rather than a flaw, in the process of understanding the topic area.

The Six-Phase Analytical Process. Braun and Clarke (2006) outline a six-phase process for RTA, as outlined below. The phases are referred to as 'phases' rather than 'steps' to highlight the increasingly recursive and non-linear nature of the analytic process (Braun & Clarke, 2021).

Phase 1: Familiarisation with the Data. Audio recordings were of each interview were listened to multiple times to allow for intimate familiarisation with the entire dataset. To begin with, the first playback involved 'active listening'. The second playback involved listening to the recordings alongside reading the rough transcripts produced by the videoconferencing software. Pausing and resuming the playback as needed, the transcripts were cleaned to correct any errors. Once all transcripts were finalised, I read each in turn. At this stage, I made notes of observations and potentially interesting areas in the context of the research questions: 'what are the issues associated with creating an electronic tool to identify children with a neurodevelopmental condition?' and 'what are the barriers and opportunities associated with implementing an electronic tool to identify children with a neurodevelopmental condition?'. Included in these notes were reflections on my thoughts and feelings about the data which formed the foundations for the subsequent stages of analysis. An example of such notes can be found in the online supplementary material.

Phase 2: Generating Initial Codes. Working systematically through the dataset, relevant, interesting or useful data items were coded with succinct descriptive labels in relation to the research questions. The process was conducted electronically via NVivo 12, a qualitative analysis software programme. Coding of the dataset was a necessarily iterative process, with codes amended and redefined frequently where they were too vague, for example, and as familiarisation with the dataset increased. *Phase 3: Generating Themes.* Codes were grouped into some initial, broad themes and sub-themes, with the focus of the analysis having shifted from individual data items to interpretation of meaningfulness across the dataset. This involved, for example, collapsing multiple codes that shared similar meanings

or underlying concepts, or recognising single codes as being representative of an overarching theme or sub-theme in the data. As Braun and Clarke (2021) emphasised, rather than the themes 'emerging' from the data, I played an *active* role in interpreting and construing relationships between different codes and began to develop a narrative that I felt communicated something meaningful in the context of the research questions.***Phase 4: Reviewing Potential Themes.*** The utility and appropriateness of the themes were evaluated both in terms of their reflectiveness of the dataset, and the relationships between the data and codes that form each themes and sub-theme – all in the context of the research questions. This stage was supported by a series of questions proposed by Braun and Clarke (2012) encouraging thought around: the theme's suitability as a theme rather than a code; the quality of the theme in terms of its ability to capture something useful about the dataset; the boundaries of the theme and what it includes and excludes; the depth of the theme in terms of sufficient meaningful supporting data, and the diversity and range of the theme and whether or not it lacks coherence. Through this process, codes and themes were refined until a final set of conceptually distinct themes and subthemes were decided.

   Phase 5: Defining and Naming Themes. Themes and subthemes were given names to reflect the "essence" of each (Braun & Clarke, 2006). Quotes from participants were used where they were meaningful, memorable, catchy and reflective of the underlying data items. Figure 2 shows the final thematic map.

Phase 6: Producing the Report. Rather than completion of the report being a distinct, separate phase, the whole process of the analysis was interwoven with its write-up, which therefore also necessitated a recursive approach. Iterations made throughout the process were documented in a reflexive journal. Within the report, the data was both synthesised and discussed in the same section, as recommended by Clarke and Braun (2021).

Reflexivity Box

Both my disciplinary context and my own positionings and life experiences have undoubtedly influenced the sorts of questions I am, or have been, drawn towards. I have worked in a range of clinical settings with adults experiencing mental health difficulties, where early adversity and unmet need in childhood are common themes; perhaps unsurprisingly, I have found myself drawn towards research relating to early intervention and strategies to improve long-term outcomes for children. I was interested particularly in the work ongoing at CAER and their ethos of striving to connect systems and data in order to improve outcomes for children in Bradford and beyond. From a pragmatic perspective, I aligned myself with local priorities and already established areas of research in the hope that this would allow my project to have particular impact and utility.

From a professional perspective, I spent time working in a neurodevelopmental assessment service on a clinical placement during my training, and went on to conduct a service evaluation project in the same service to explore parents' and carers' experiences of supporting their child through the assessment. These experiences offered me an appreciation of the impact of many years of awaiting a diagnosis, but perhaps most importantly, their sense of desperation and helplessness owing to the lack of post-diagnostic support available for families; I recall one parent likening this to winning the lottery, but the money being in pesos. Reflecting on my experience of interviewing parents and carers, I believe there was a parallel process taking place in that I connected with a pull to want to be able to help, signpost, or advise - yet the absence of any real provision left me, too, with my own sense of helplessness. This experience has undoubtedly been a motivator for connecting with such a topic area and moving forward with this particular project.

Results and Discussion

In answer to the research questions 'what are the issues associated with creating an electronic tool to identify children with a neurodevelopmental condition?' (RQ1) and 'what are the barriers and opportunities associated with implementing an electronic tool to identify children with a neurodevelopmental condition?' (RQ2), four themes were identified: 'Theme 1: Making the Implicit, Explicit', 'Theme 2: Communicating with Each Other', 'Theme 3: Respect and Recognition' and 'Theme 4: The Big Picture of Acceptability'. Nine subthemes were developed across the themes (Figure 2). Each will be presented in turn with discussion included as a 'bookend' to each overall theme. Themes 1 and 2 more clearly offer insights into RQ1 (creation) and Themes 3 and 4 relate more directly to RQ2 (implementation). However, insight into both research questions can be found across all four themes. Supporting data can be found in the online supplementary material.

Figure 2

Final Thematic Map
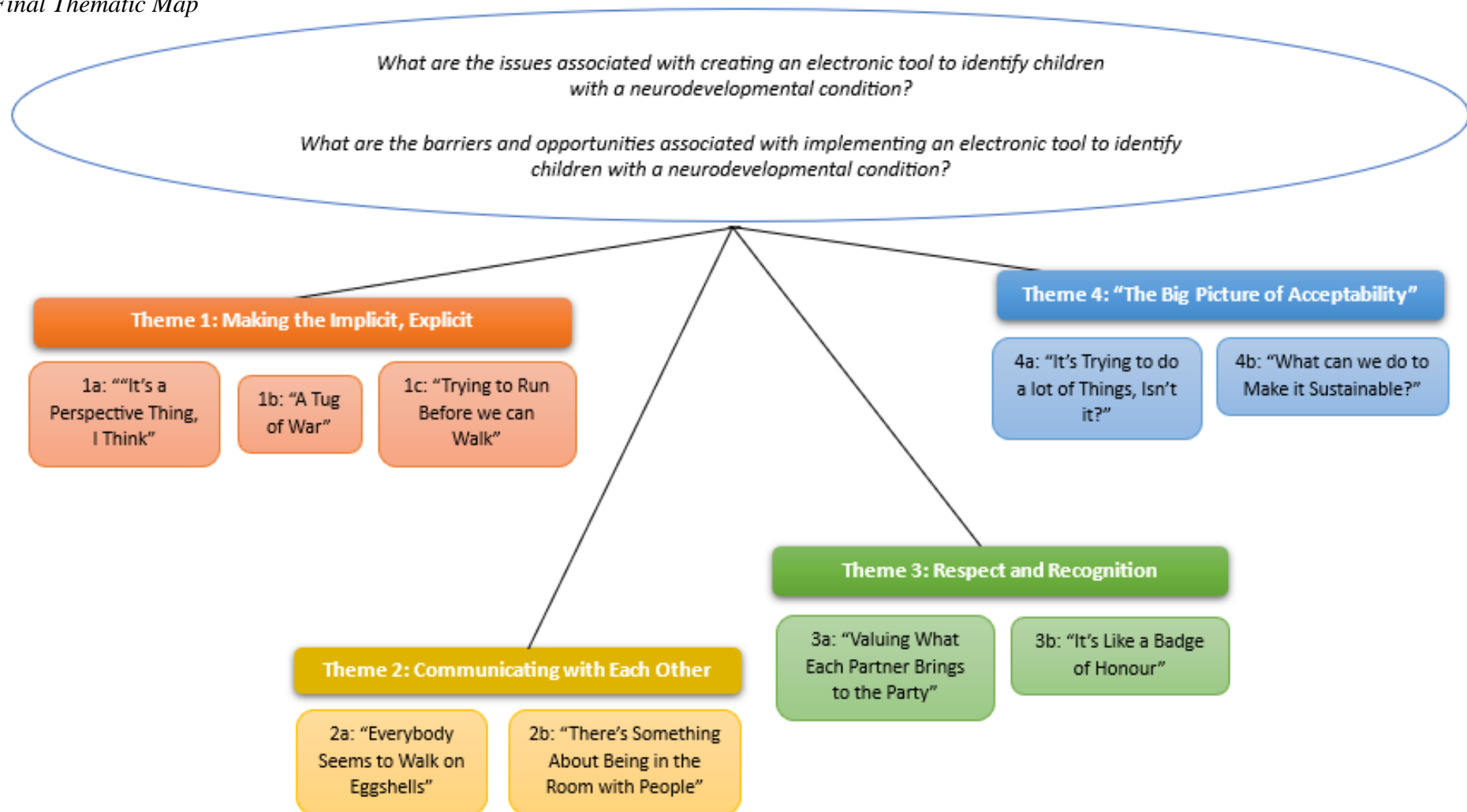
Theme 1: Making the Implicit, Explicit

Participants felt the project lacked a shared, solid foundation to develop from. Participants' understanding of each other's perspectives and professional 'givens' was unclear; ownership, was not clearly defined, and there was an absence of a robust, supportive framework. This created tension between the groups.

1a: "It's a Perspective Thing, I Think".A lack of shared understanding or appreciation of the requirements of the different groups was apparent. This sounded to feed into a very specific tension with regards to both the creation and implementation of the tool, whereby researchers and Educational Psychologists (EPs) felt tightly bound by their professional contexts and assumptions. For example, the research team spoke of the need for scientific rigour and the importance of working flexibly to ensure the project satisfied this. EPs spoke of the underlying philosophy of education and the way in which this often clashes with a "data-driven approach". They were particularly concerned with the lack of capacity in schools; whilst recognising the value in the data schools might be able to provide, they expressed a sense of not wanting to burden staff with additional demands, including a nervousness around introducing a tool still in development. Interestingly, albeit emphasising the importance of this being done in "snippets", SENCOs recognised the importance of a live, 'work in progress' approach. Ultimately, participants acknowledged the existence of different perspectives and the way in which various factors might "feel a lot bigger from the other side" (CAER), it was felt that this should have been discussed explicitly from the outset of the project. The value of cementing this into a formal, written document was also suggested.

> **Reflexivity Box**
>
> That education and health services are overstretched and under-resourced systems stood out clearly to me in the transcripts. This made me think about systems as psychological entities. I reflected on ideas from Cognitive Analytic Therapy (Ryle & Kerr, 2020), as applied to stress and adversity experienced in systems - including the way in which stress is held within systems, and the unseen 'relational tangle' that might underpin this. Under pressure, I know that, on one level, individual reflective capacity reduces and it can be difficult to hold others' perspectives in mind. On another level, I know that perspectives can become fragmented, and one can struggle to find the 'grey area' or 'middle ground'. My knowledge in this regard likely influenced my decisions to develop 'perspectives' as a particular theme; I wondered about the impact of systemic pressures – which are undoubtedly felt by participants in the study - on their ability to work together cohesively. I noticed a personal sense during my analysis of wanting to and encourage reflective capacity, and perhaps this sub-theme serves as an outlet for this.

1b: "A Tug of War". For the researchers and the EPs, ownership was unclear and this resulted in an additional layer of tension and confusion around the direction of travel during the development process. Such lack of clarity contributed to blurred roles and responsibilities and lack of accountability. For example, unexpected shifts in the work had resulted in previous efforts feeling "not quite obsolete" (EP), but no longer entirely relevant, creating a sense of frustration and deflation. Relatedly, lack of clear authority was also problematic, resulting in an "understandable nervousness to act and get stuff going" (CAER) and a significant amount of time being spent attempting to justify decisions or "no-go lines" (CAER). Again, both groups agreed that explicitly discussing and documenting these assumptions would have been valuable. Alongside clearer agreements for ownership and control, this included clarification around what was envisioned for the project which would allow for more transparent decision-making and, rather than a 'power struggle', an increased sense of cohesion across the project team.

1c: "Trying to Run Before We Can Walk". Participants reflected on a lack of time spent "scoping out the job" (CAER) and sketching out strategic plans for the project. Specifically, the importance of setting and adhering to accurate, realistic timelines was raised, along with the need for more explicit requirements from each group in terms of criteria for progress at each stage. Unsurprisingly, timelines were deemed to be critical for schools wherein advance planning is required, along with consideration of fluctuating staff morale in the context of the academic calendar and

the varying demands placed on staff at different points throughout the year.
However, limits to planning were acknowledged across all groups to some extent as
a result "ever-evolving" nature of the project (CAER), and the possibility for plans
to be delayed or shifted by unknown factors.

Discussion. That so many factors in the development process were simply
assumed, unshared, unclear or overlooked is perhaps unsurprising in the context of
the stark lack of guidance generally available to support the system in identifying
and meeting the needs of children with a neurodevelopmental condition (Kulz,
2015). Moreover, the apparent tension across the different perspectives,
responsibilities and priorities perhaps makes sense, given the traditional, siloed
systems and structures and domain-specific ways of working, now recognised as
being not fit for purpose.

As suggested by John et al. (2022), the integration of systems (such as health,
education and research) and a more unified, connected approach to providing
support is paramount in order to effectively meet the needs of children and young
people. However, the findings here suggest that such integration can only grow from
carefully prepared, fertile ground, including an appreciation for the whole system
and a clear, collective understanding of the needs of each of its constituent parts.
Combined with more explicitly defined roles and responsibilities, this might allow
for more cohesive and transparent strategic planning and, in turn, more effective co-
ordination with the school timeline.

Theme 2: Communicating with Each Other

Communication posed a significant challenge for the development of the tool.
This sounded to be driven by fears of conflict or ruptures, and unclear, inconsistent
or ineffective communication strategies.

2a: "Everybody Seems to Walk on Eggshells". Seemingly driven by a fear of
causing offence or rupturing relationships, communication was fragmented and
duplicated, taking the shape of circular, "back and forth" (CAER) conversations.
This created multiple different consequences. Whilst there were mixed views on the
surface regarding the usefulness of the 'mediator' role, it appeared that this had only
fostered more of a divide between the research team and EPs, deepening each side's
sense of feeling either misunderstood, dismissed or uninformed. Conversations both
within and between groups were duplicated as a result. Perhaps in another attempt to
avoid conflict, communication had sometimes collapsed entirely, with decisions and

changes not shared nor communicated to the whole team. For some participants, this created a sense of self-doubt where they questioned their own understanding of the project. Consequences also extended to the impact on relationships with schools, whereby communication strategies had not been clearly agreed or adhered to.

2b: "There's Something About Being in the Room with People". Modes of communication were varied, including individual phone calls and emails. This made it difficult for all participants to be "on the same page" (CAER). There was a clear preference from both CAER and EPs for meetings, where these were viewed as "constrictive", "exciting" and "challenging" (EP). Specifically, EPs valued face-to-face meetings and the way in which being in the room together allows for a more "instinctive response" to each other's perspective. However, outside of meetings, both groups recognised a drift or deterioration in communication, where progress was not shared across the team, or actions were reversed in the context of privately aired concerns. This suggests that whilst meetings were the preferred mode of communication, barriers to effective, transparent communication still existed.

Reflexivity Box

As a Trainee Clinical Psychologist, it's perhaps unsurprising that I have deemed 'communication' important enough to be a theme in itself. I was struck by the impact of communication on participants' experience of working on the project, and really connected with feelings of frustration, confusion and disappointment. I reflected on my own experiences of communication as a psychologist, including those where communication has contributed to difficult ruptures in the therapeutic relationship. Now, I strive to adopt a transparent approach to working with people, paying close attention to the process of the work and tending to narrate this aloud, often sharing my dilemmas about the work with the client. This extends to the very first meeting with a client wherein it's important for us to think not just about goals for therapy, but about how we will talk together and navigate potential difficulties, with therapeutic alliance being a key predictor of change (Flückiger et al., 2018). This has undoubtedly influenced the ideas I attended to in the data.

Discussion. The findings suggest that direct, whole-group communication was lacking, and that more of this would have minimised the risk of fragmentation, strengthened the group's shared understanding of the project's development, and optimised efficiency. However, fear of conflict appeared to be a significant barrier to this, even when whole-group meetings took place. Ultimately, there appeared to be an underlying idea about safety: what is safe to communicate, to who, and how?

Such findings could be made sense of in light of the previous subtheme (2a) and the lack of an explicit 'contract' for how the group would work together effectively.

Furthermore, the utility of regular 'review' meetings might be highlighted here: a protected (and perhaps externally facilitated) space to pause, connect and reflect on the process (as opposed to the content) of being part of such transformational but unchartered work. This may empower the group to adopt a transparent approach to communication.

Theme 3: Respect and Recognition

With all stakeholders working towards the same goal, the importance of recognising and making space for one another's unique contributions was discussed, and participants reflected on the power of feeling a sense of belonging within the work.

3a: "Valuing What Each Partner Brings to the Party". Participants spoke of opportunities for growth and learning from one another, with the "strength and wealth of expertise" creating the potential to develop something "really powerful" (CAER). Specifically, EPs appreciated the strong academic front afforded to the tool as a result of working in collaboration with CAER. However, it was felt that their own experience and knowledge of school systems was sometimes undervalued and not incorporated into decisions, leaving them in a difficult position of having to manage the fallout with schools and work to repair relationships. Moreover, participants highlighted the importance of recognising the inherent professionalism and willingness of teachers and the adjustments that they likely already, innately, make. This was deemed to be critical in ensuring that teachers feel respected and empowered, rather than alienated, to be an ongoing part of whole system change.

Reflexivity Box

Having worked in busy clinical services for some time, I have an appreciation for how difficult it can be to carry out research in such settings, and the myriad of practical and ethical challenges that can arise. I also reflected on services wherein psychologists have had to work tactfully and strategically for their voices to be heard or valued, in the context of more medically dominated teams, for example. It is possible therefore that I felt an affinity here with the EP's perspectives and experienced a possible subconscious 'striving' to represent their position more favourably. To counter this, I spent to revisiting the transcript to ground myself in the views and ideas of *all* participants.

3b: "It's Like a Badge of Honour". In discussions around the implementation of the tool, the importance of identity was apparent. For example, SENCOs spoke to the way in which feeling part of the project would likely increase staff's drive to participate in it. Within this, visible recognition of the work was important, such as through logos and email signatures. It was felt that this would not only advertise the work across the system, but also help staff to remain cognisant and proud of what they are representing. On the other hand, EPs also recognised the challenges that this may present for teachers, including the confidence required to identify possible neurodevelopmental needs as well as the shift in language associated with moving away from a diagnosis-led model of support. Moreover, participants related ideas around identity and recognition also to the opportunities the tool hopes to create for children, including understanding and celebrating individual strengths, and accepting and welcoming difference.

Discussion. The findings raise an important a question about what it means 'to value' or 'be valued', perhaps pointing towards the importance of ideas being recognised in a way that feels *meaningful* - rather than just voiced, or surface-level. Relatedly, and in line with the findings from Martin-Denham (2021) highlighting teacher's reliance on "gut feeling" to support pupils, the need to recognise the innate professionalism of teachers suggests that sensitive, thoughtful consideration is required to ensure teachers feel *genuinely* valued and respected.

Moreover, feeling connected to and proud of the work may be a key facilitator of teachers' engagement; the findings highlight potential utility in developing a brand or identity to represent the project and empower teachers to embody the assumptions underpinning the work. In the context of the tendency for children with neurodevelopmental needs to be labelled as "bad" or "naughty (Apland et al., 2017) or perceived as a challenge (Nye et al., 2016), the findings also reflect an optimism that the tool will bring about a sense of welcome and acceptance for all.

Theme 4: "The Big Picture of Acceptability"

The success of the tool in schools was thought to be dependent on both feasibility in the short-term, and sustainability in the long-term.

4a: "It's Trying to do a lot of Things, Isn't It?". Variety was apparent in participants' accounts of what level of need the tool would aim to identify, and what the process of doing so might look like. Reference was made to both children who experience significant difficulty in accessing the classroom, and children whose

needs are perhaps less obvious, and participants reflected on the potential for the tool to flag large proportions of the class; indeed, SENCOs spoke to the risk of the tool becoming an cumbersome to teacher's workloads, citing this a potentially critical barrier to the success of the project. Emphasis was placed on the need for the tool to remain "manageable" and "easy to use" for teachers (EP). In this context, EPs speculated about the tool triggering a range of different responses from teachers, from encouraging reflection and "real time problem solving", to the more holistic, in-depth profiling conversation.

4b: "What Can we do to Make it Sustainable?". In order for the tool to be feasible for schools in the long-term, participants reflected on the need to embed the tool in a "community of school" (SENCO) and, potentially, within ideas and structures already existing in the system. SENCOs emphasised the importance of being able to delegate the tool to teachers and teaching assistants alike in order to increase buy-in across the school. Moreover, participants discussed the risk of teachers feeling isolated with the tool, fearing making mistakes. In this context, the value of "connecting people" (SENCO) was apparent; reference was made to the need for clear support structures and reflective spaces for all staff, as active, valued contributors to the project, to "bounce ideas from" (SENCO). Participants also speculated about the possibility of building the tool into the established model of teaching (beginning with 'quality first teaching', followed by SENCO input or local authority support, as appropriate) and existing "wellbeing" priorities in order to prevent it from becoming "othered" (EP).

Discussion. Use of the tool to identify and support a range of different levels of need is supported by Graham et al's (2019) reporting that children with *any* level of SEND (including ASD) are disproportionately excluded from school. This is exacerbated by the fact that not all children's needs are perceived as significant or visible enough to meet SEND criteria (Martin-Denham, 2021), creating a group of vulnerable children who, unrecognised and unsupported, resort to expressing their needs or distress through behaviour that attracts harmful, negative labels and outcomes (Horridge, 2019; Brede et al., 2017). Participants' responses, in conjunction with the literature, suggest that the ENPT must capture a whole spectrum of need in order to be useful. In this context, with the ENPT's grounding in the Early Years Foundation Stage Profile (EYFSP), the high sensitivity of the EYFSP (Atkinson et al., 2022) gives promise to the ability of the ENPT to identify

children whose needs may otherwise fall beneath the radar, as well as those whose needs are more visible.

The risk of the tool becoming unmanageable however is also reflected in the literature; the absence of effective, meaningful support for teachers (Kulz, 2015) and their lack of time to explore drivers of behaviour (Hastings and Brown 2002; Golder et al., 2009; Hodkinson 2009; Kulz 2015) is clear. This highlights the importance of the tool being used flexibly and on a needs-led basis. However, participants' responses suggest that the success of this in the long-term is dependent on the tool being woven into the fabric of the whole school network, rather than being held as a separate task by class teachers in isolation; the findings highlight the importance of connection between involved staff members to empower and to sustain buy-in to this new way of working.

> **Reflexivity Box**
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> In the earlier stages of my theme development, the concept of 'connection' was a theme in itself. However, as my analysis continued, I began to see connection in multiple other themes and subthemes which led me to question its utility as a standalone theme. I reflected on the myriad of ideas I personally associate with connection, or outcomes I have seen connection facilitate through my work, including: support, understanding, safety, validation, creativity, reflection, learning, growth, restoration, regulation, belonging…an almost endless list. Reflection allowed me to recognise connection not only as a fundamental part of my professional life, but also as an important value to me on a personal level; this undoubtedly shaped my analytic thinking in those early stages. As I refined my themes, it later made more sense to me to conceptualise connection within the broader subtheme of 'sustainability'; the 'coming together' of people is seemingly a broadly important determinant of the project's success and longevity.

Overall Discussion of Findings

Themes spanned across both the development and implementation of the tool, with the issues, challenges and opportunities identified often apparent in both stages.

Firstly, the findings demonstrated that the different professional standpoints of stakeholders created tension and lack of understanding across participants. In order for stakeholders to come together cohesively, **it is important that implicit information is discussed and negotiated explicitly and transparently** from the outset of the work. Such information might include professional assumptions, ideas, capacities, goals, priorities, roles, responsibilities, boundaries, and needs.

A further challenge to the work involved indirect and inconsistent approaches to communication and a lack of felt 'safety' in this regard which contributed to fragmentation across the group. The findings highlight **the importance of considering the *process* of engaging in this work**, in addition to the content, and **the need to agree consistent, inclusive forums for communication** that allow decisions and updates to be shared by or with the whole group. Given the evolving nature of the project, and that school staff will become increasingly involved as the project moves into the implementation stages, it may be useful to review these points on a regular basis.

Moreover, fostering a sense of mutual, meaningful respect and recognition for all involved appears to be crucial for both the successful development and implementation of the project; this emerged as both an issue and a potential opportunity. Specifically, the findings highlight the significance of ensuring that **the contributions of all stakeholders are acknowledged and valued,** and the **importance of building a culture or sense identity** to underpin the project, whereby involvement in this work is something to be proud of.

Finally, the importance of buy-in in both the short and long term was evident. For example, the potential vastness of the tool was highlighted. Whilst this may create much opportunity with regards to identifying varying levels of need, this was also identified as a potential challenge in the context of schools' extremely limited capacities. Critically, the findings point towards the need for **flexibility in terms of expectations around teachers' usage of the tool**, in addition to the creation of **strong inter- and intra-school networks** whereby staff can feel connected, supported and empowered.

Whilst the findings offer some rich insights into barriers, challenges and opportunities associated with the project, the analysis did not come without limitations. Primarily, the decision to recruit a small sample consisting of stakeholders who were closely involved with the work was a pragmatic one. The sample offered a useful, 'live' snapshot of the work during a window of opportunity in between the development and implementation stages as they were already engaged in the project and therefore readily contactable and available. However, whilst Educational Psychologists and SENCOs were able to act as proxies for schools, it would have been useful to have additional representation from class teachers to gain a more in-depth sense of the challenges and opportunities that might

be associated with implementing the tool. In this regard, it will be crucial to hear the views of class teachers as the project progresses; the findings highlight the importance of connecting and engaging with staff to inform the implementation of the tool and empower staff to use it.

Similarly, the voice of children and young people with a neurodevelopmental condition were missing from the study. Indeed, Guldberg et al., (n.d.) discussed the importance of this in all stages of the project; young people in their focus groups emphasised that neurodiverse pupils are a huge resource of experts by experience, although one scarcely drawn upon (Roberts et al., 2016). The involvement of this perspective should therefore be considered in the next stages of the project to offer an additional expert lens on the implementation of the tool.

General Conclusions

School exclusion is associated with a myriad of poor outcomes, including increased risk of NEET and engagement in anti-social behaviour, lack of social capital and connections, and reduced psychological wellbeing (Daniels & Cole, 2010; Evans et al., 2009; Feng et al., 2015; Ford et al., 2018; Graham et al., 2019; Parker et al., 2016). Yet rates are highest for those *already* experiencing significant vulnerability and life challenges such as low household income, family mental health difficulties, or unsafe or unstable family environments (Apland et al., 2017; Evans, 2009; Gill et al., 2017). Whilst the most commonly reported reason for exclusion is 'persistent disruptive behaviour' (Department for Education 2021; 2023), the disproportionate figures point towards a wider set of inequalities faced by children and young people in the family home. Indeed, prior research has demonstrated the detrimental impact of family instability on children's behaviour (Cavanagh, 2008; Mitchell, 2013; Zilanawala et al., 2019). However, the complexity and intersectionality in risk factors for exclusion is clear, and the literature highlights the utility of recognising behaviour that challenges in a broader sense, as an expression of 'unmet need'.

As a specific type of need, children with SEND are disproportionately excluded from school, irrespective of whether their level of need. Falling under the SEND umbrella, children with a diagnosis of ASD are also reported to be at an elevated risk of exclusion in comparison to their neurotypical peers (John et al., 2022; Totsika et al., 2020). Studies have generally attributed this to way in which schools are not equipped to meet the needs of this group, with limited knowledge, training and guidance and a reliance on intuition. Schools are reliant on a clinical diagnosis, yet long waiting lists for a neurodevelopmental assessment have resulted in many children and young people (CYP) not receiving timely support. Arguably, this exacerbates the challenges faced by children with neurodevelopmental needs, who become labelled as simply 'misbehaving'.

However, a population level, place-based approach was required to understand local systems and identify potential solutions. Through investigating the relationship between ASD and school exclusion, the quantitative study revealed high rates of exclusion amongst children awaiting a clinical diagnosis. This suggests that difficulties communicating, interacting, and managing in the school environment, coupled with lack of timely support, manifests as behaviour perceived as

challenging and disruptive by school staff. Significantly, the sharp rise in rates of exclusion at the point of transition may be reflective of the particular challenges faced at this time by children whose neurodevelopmental needs are not well understood. However, the current findings suggest that this may not translate into effective support even when a diagnosis of ASD is confirmed. Accordingly, the importance of being led by need rather than by diagnosis status, in a timely manner, is clear. Such findings have particular significance in the context of Bradford's poor levels of social mobility, wherein the 'vulnerability gap' (Quilter-Pinner & Gill, 2020) alone *automatically* disadvantages pupils. Arguably, unmet neurodevelopmental need will likely only exacerbate the significant barriers to opportunity that already exist for many. However, as documented in the literature, it is evident that schools require additional tools and guidance to be able to provide effective support (Golder et al., 2010; Hastings & Brown, 2002; Hodkinson, 2009., Holttum, 2015; Kulz et al., 2015; Martin-Denham, 2021; Power & Taylor, 2019; White et al., 2013).

Adopting a pragmatic approach, consultation with a local headteacher underlined the difficulty with operationalising and capturing familial factors. Instead, emphasis was placed on the importance of identifying need at a much earlier point in time. The challenges associated with bringing professionals and parents together to develop a holistic picture of the child's needs were also discussed, along with inconsistent information recording in relation to behaviour and lack of an accurate, professional discourse around this. The value of an evidence-based profiling tool was suggested, with clear enthusiasm for this clearly apparent from subsequent consultation with professionals across the district.

The Early Years Foundation Stage Profile (EYFSP) has been shown to be an effective tool in the identification of both neurodevelopmental need, and SEN more generally, including the needs of children who may fall slightly below the formal or clinical thresholds (Atkinson et al., 2022; Wright et al., 2019). On this basis, an Electronic Neurodiversity Profiling Tool (ENPT) was developed as a needs-led resource to guide schools to more accurately identify the learning and support needs of the child without delay, regardless of their diagnosis status. Utilising the CLEVER framework to calibrate the quantitative data with the lived experience of stakeholders, the qualitative study explored the ENPT as a potential solution to the problem of the disproportionate rates of exclusion for children with unmet

neurodevelopmental needs. Specifically, the study aimed to understand how professionals and systems can operate cohesively to develop and implement the tool. Reflexive thematic analysis of semi-structured interviews with professionals highlighted the importance of transparent discussions from the outset of such a project to develop a shared understanding of different professional perspectives, ideas and needs in relation to the work, and to gain clarity about the process of working together. Relatedly, the need for consistent, inclusive modes of communication was identified to ensure a joined up, connected approach. Valuing and respecting the contributions of all stakeholders in a meaningful way was also deemed crucial, as was building a culture or sense of identity to empower and engage teachers in the project. Finally, in order for the tool to be experienced as acceptable for school staff, the need for flexibility with regards to usage of the tool may be critical to its success, along with space for staff to connect and reflect on their experiences of using it. Despite the place-based nature of this study, such an emphasis on 'connection' and the very human process of 'coming together' means that the findings will, arguably, have universal relevance for local authorities across the country.

Overall, the findings offer exciting support for an alternative, needs-led way of working which may reduce reliance on clinical services. Strengthening the existing knowledge of teachers, it is expected that the Electronic Neurodiversity Profiling Tool will enable staff to feel more informed and skilled to recognise neurodevelopmental need in a much more timely manner, empowering them to make a range of adjustments to meet the needs of pupils. It is expected that this will correlate with a reduction in behaviour that challenges, along with decreased rates of school exclusion and improved long-term outcomes for children and young people with a neurodevelopmental condition. It is anticipated that the findings will also inform the development of similar solutions beyond Bradford, serving as a 'toolkit' to allow clinicians, teachers and parents to come together in a transformational way of meeting neurodevelopmental need. Ultimately, it is hoped that this will facilitate an equitable experience of education whereby neurodiversity is understood supported, and embraced, thus bridging the gap between vulnerability, and opportunity.

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Supplementary Material

Supplementary material can be accessed via the following link:

https://www.dropbox.com/sh/z3scygg1mrqv6sw/AACafPBkq-Ra-FKVgLCHtvuka?dl=0