Promoting the independent mobility of young people with SEND: The lived experience of young people with autism, ADHD, and learning disabilities

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ABSTRACT

Introduction: Young people with special educational needs and disabilities (SEND) are at heightened risk of road traffic injury and their caregivers are often concerned about independent mobility and the safety risks it poses. This qualitative research aimed to increase understanding of the facilitators and barriers to independent mobility for 7–10 and 11-13 year-olds with SEND.
Method: Thirteen young people (11 male and two female, six children 7-10 years-old and seven children 11-13 years-old) diagnosed with autism, attention deficit hyperactivity disorder (ADHD), or learning disabilities video recorded three journeys they regularly undertook and then participated in a semi-structured interview with their caregiver. A thematic analysis of travel films and interview transcripts was conducted.
Results: Younger children were typically not travelling independently, but both older and younger children were anxious about independent mobility. Younger and older children with SEND demonstrated unsafe behaviours in the road, had limited awareness at times of road safety, could become overwhelmed, and required longer to process information.
Conclusions: The findings informed recommendations for how to effectively support the independent mobility of young people with SEND. Children are often diagnosed with multiple conditions, and it is the profile rather than the specific diagnosis that impacts their road safety. Targeting specific behaviours rather than specific disorders may therefore be a more effective approach. Road safety was a central concern for caregivers, but it was one aspect of independent mobility and a broad focus on teaching independent mobility was preferable. Support with independent mobility and road safety should be provided by a range of people who come into contact with the young person and education may need repeating at key transition points.

1. Introduction

A crucial part of achieving independence for all children and young people is having a good grasp of road safety skills. Independent

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mobility is associated with a host of positive outcomes, including social inclusion, access to employment, education and other services, improved wellbeing and quality of live and increased autonomy (Berg and Ihlström, 2019; Kaufmann et al., 2004; Thynell, 2017; Vella-Brodrick and Stanley, 2013). Added to this, being able to travel around the local environment provides children with opportunities to develop their cognitive, physical and social and emotional skills (Cox, 2020). However, the number of children travelling independently has been declining; with caregivers often stating traffic, distance to destination and personal safety as barriers (Cox, 2020). There may be some children who experience more restrictions in relation to independent mobility than others, such as children with special educational needs and disabilities (SEND).

Although understanding of the cognitive and behavioural challenges faced by children with SEND in the traffic environment has increased (Williams et al. 2002), there remains a need for research to address the needs of the 3.7% of the school population with an Education, Health and Care Plan (EHCP) (DfE, 2021) who are at most risk, because the road safety education is not sufficiently tailored to address their needs and requirements (O'Toole and Christie, 2019). While independent mobility has increased prominence in the SEND Code of Practice (DfE, 2020), the potential that some children with learning disabilities, autism and attention deficit hyperactivity disorder (ADHD) have of achieving this – and with it social inclusion – is compromised by a lack of awareness of danger, locating potential hazards, and their proneness to impulsiveness or difficulty in thinking and acting in the flexible ways required to navigate and keep safe in the traffic environment (Graham et al., 2005; Williams et al., 2002).

Behavioural road safety training has been found to be effective in improving concept knowledge as well as behaviour and should be carried out from 4 to 5 years-old through to adolescence (Dragutinovic and Twisk, 2006). This research though often does not evaluate the effectiveness of training with SEND populations (O'Toole & Christie, 2019). Research suggests that resources for typically developing children are often modified for use with children with SEND (Williams et al., 2002). Parents have stated that road safety education often fails to provide the extra assistance their children with SEND need and have suggested simpler resources would be beneficial (Graham et al., 2005). However, adapting educational resources for children with SEND is challenging (Klang et al., 2019; Webster and Blatchford, 2015). This reflects the debate regarding whether education more generally needs to be adapted for children with SEND. Many teachers do not feel that they have the skills, experience or resources to effectively educate children with SEND (OFSTED, 2004). The view that tailored pedagogical approaches are needed for SEND has been widely critiqued (Thomas and Loxley, 2001) and there has been a greater focus on identifying inclusive, universal teaching approaches (UNESCO, 1994).

Research is needed to identify strategies that address the specific challenges children with SEND face in learning road safety skills (Christie, 1995; Williams et al., 2002), and on effective ways to teach them about road safety. This study aimed to increase understanding of the facilitators and barriers to road safety education experienced by children between 7 and 13 years of age with SEND. Experiences of younger (7-10 y) and older (11-13 y) participants were compared as there is a peak in road injuries around the secondary school transition (O'Toole and Christie, 2018). Further, younger children may not be engaging in the same level of independent mobility due to age. Although there is no legal age for children to walk to and from school unaccompanied in the UK, a survey reported that most people felt this should not be until 10 years-old (YouGov, 2012). The Walk to School Campaign, however, support the view that parents should be responsible for deciding when their child is confident and capable to walk unaccompanied to and from school (https://www.livingstreets.org.uk/walk-to-school). There has been a greater reduction in the number of primary school aged children compared to secondary school aged children walking unaccompanied to and from school since 1970 (Shaw et al., 2012).

Road safety education for children across categories of SEND including learning disabilities (mild or moderate) and developmental disorders (ADHD or autism) was explored. This project aimed to provide a 'voice' to children with SEND and their caregivers by using an inclusive interview procedure. Children were given portable cameras to film three journeys and were then interviewed about these videos along with their caregivers. The video and interview data were used to identify facilitators and barriers to independent mobility and inform effective travel training methods.

Table 1
Sample characteristics.

ID	Gender	Age (years)	Ethnicity	Diagnoses	School
7-10 y					
A001	Male	9	White British	Autism, PDA	SEND
A006	Male	7	White British	Autism, learning disability, sensory processing disorder, hypermobility	Mainstream
AD001	Male	8	White British	ADHD	Mainstream
AD002	Male	10	White British	Autism, ADHD, sensory processing disorder, hypermobility and epilepsy	Mainstream
AD003	Male	9	White British	ADHD	Mainstream
AD004	Female	8	White European	ADHD	Mainstream
11-13 y					
A002	Female	13	White British	Autism, mild LD	SEND
A003	Male	13	Black British	Autism and Non-verbal	SEND
A004	Male	11	White British	Autism and PDA	Mainstream
A005	Male	11	White British	Autism, Polymicrogyria and epilepsy	Mainstream
A007	Male	11	White Asian	Autism	Mainstream
A010	Male	11	White British	Autism, ADHD, dyslexia	Unit in mainstream
A011	Male	13	White British	Autism, learning disability, hemiplegia and epilepsy	SEND

2. Methodology

2.1. Participants

The sample included 13 participants (11 male and two female) between the ages of 7 and 13 years and their caregivers (Table 1). This included six participants between 7 and 10 years-old and seven children between 11 and 13 years-old. Participants were recruited via SEND charities and social media channels. Four participants were diagnosed with autism, two of whom had an additional diagnosis of pathological demand avoidance (PDA); three participants had ADHD; and six participants had a varied profile of disabilities. Six participants had EHCP.

2.2. Procedure

Participants were provided with a wearable camera and asked to record three familiar journeys. Participants and caregivers were then interviewed about the films and road safety and independent mobility more broadly. This project received ethical approval. Informed consent was obtained from caregivers and verbal consent was obtained from participants.

2.3. Journey films

Participants were asked to make and film a familiar journey, as they would usually travel (e.g., independently or accompanied by a caregiver; taking the same route and mode of transport) without modifying their typical language or behaviour. They were asked to focus on walking journeys and to include a school/college journey where possible. The journey was filmed to capture audio and visual data. The camera was either worn by the child (attached to a lanyard around the neck) or operated by the caregiver.

2.4. Semi-structured interviews

Following the filming, children took part in a semi-structured interview about their journeys. Caregivers participated in a separate semi-structured interview about the journey and their child's independent mobility and road safety. Interviews were held within two weeks of filming to facilitate participant recall.

The lead author reviewed the films and captured screenshots of significant scenes from the films, such as those involving examples of safe and unsafe road behaviour, or an incident (e.g. child failing to recognise presence of vehicle in car park, Fig. 1). Each child was asked questions about selected screenshots presented on a computer tablet, and questions on independent travel and road safety (e.g. how do they travel, where to, and who teaches them road safety). There were visual responses to questions on the tablet that children could select, with support from the researcher. Where interviews were conducted via phone/video calling, these documents were presented on screen or sent to the child (via their caregiver) prior to the interview. Interviews with children lasted approximately 10–15 min.

Interviews with caregivers were either face-to- face or via phone/video calling using a topic guide that explored caregiver views on their child's independent mobility and road safety, plus their involvement in their child's road safety and support from external parties. Interviews lasted between 30 and 60 min. All interviews were audio recorded and transcribed verbatim.
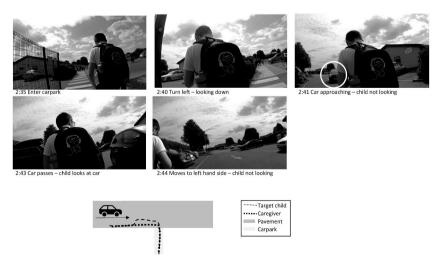

Fig. 1. Screenshots of child participant in carpark

2.5. Thematic analysis

Following Braun and Clarke's thematic analysis approach (Braun and Clarke, 2006), thematic analyses of film and interview data were carried out. This process involved first coding segments of data and then collating these codes in to overarching themes. Journey films were analysed first. Video segments containing both visual and auditory information were coded. These codes were then revised and themes were created from code groupings. This coding framework was then applied to interview transcripts.

3. Findings

Because of the variation in participants' SEND profiles, themes were explored across participants, rather than across diagnoses. Further, it became apparent after analysis had commenced that themes were reflective of the sample as a whole rather than diagnostic categories.

Thematic analysis resulted in three main themes being identified: 1) Independent mobility; 2) Child factors; and 3) Supporting children's independent mobility.

3.1. Independent mobility

Perspectives on independent mobility. Caregivers of younger and older children wanted their child to be independent, including travelling independently, as they moved into adolescence. However, independent mobility and particularly road safety were major sources of anxiety and stress for caregivers. Caregivers felt they as well as their child needed to build confidence.

Younger children were typically not travelling independently, but most were undertaking some preparation towards independent mobility, though this varied greatly. Some younger and older children wanted to start making trips independently, whereas others (mainly diagnosed with autism) preferred to travel accompanied:

> '…I am aware that some of his friends are doing things like going to the park on their own and that's not something I can see myself letting him do for several years because of the roads on the way there...' (Caregiver A004)

Some caregivers felt that their child, unlike their peers, would not be progressing to travelling independently to school or with friends. Some caregivers felt their children were unlikely to travel independently in the future whereas others felt they may eventually be able to travel familiar routes independently.

Road Safety. Both safe and unsafe crossings were seen both at the road and at designated crossings (e.g. Pelican, Zebra) in the video diaries. When crossing minor roads or vehicle accessways children more often failed to follow the highway code. There were incidents of participants stepping into the road to cross when there were oncoming vehicles. A few children reported having serious incidents in the road environment:

> ' … basically I ran across the road because I was excited to go to the park but [a car] was going fast; it slowed down but it didn't stop. It tried to curve around me and that's why I ended up hitting it … I mean I was okay … I was crying but I wasn't crying so bad because it wasn't that much of a hit.' (Child AD003)

Caregivers of younger participants demonstrated inconsistent hand holding in the video diaries. There was a tendency for caregivers to hold their child's hand more often when crossing the road or in busier environments. Caregivers and children also interchanged who was walking roadside.

3.2. Child factors

Awareness. Both older and younger children were thought to understand road safety rules but fail to implement them because they are distracted, consumed by their own interests, or overwhelmed:

> 'She would know that the road is danger but she wouldn't necessarily be thinking about it … ' (Caregiver A002)

This was evident in video diaries as children were seen distracted by phones, magazines or the environment. Caregivers were particularly concerned that children were often unaware of danger, especially in car parks, and had limited understanding of personal safety and personal boundaries. Indeed, in their videos children often walked near other pedestrians and cycled or scooted on the pavement, weaving in-between pedestrians:

> '[He] is very comfortable speaking to adults, loves hugging people and doesn't always think … ' (Caregiver A001)

Anxiety. Younger and older children were anxious about travelling independently as well as about unexpected events, dogs, groups of young people or disorderly behaviour and this at times overwhelmed them and they were unable to focus on road safety:

> 'I think anxiety plays a part … very quickly if the situation isn't as he expects, he will get to panic very quickly, whereas I observe that some of his typical friends would think their way through it. I think his brain gets overloaded and his nervous system kicks off faster … ' (Caregiver A004)

Cognitive abilities. Caregivers reported children required longer to process information and had poor short-term memory. Sensory processing was challenging for children, particularly with autism, and the majority found environmental noise overwhelming.

Children with autism were often described as very rules focused and followed the rules rigidly:

> 'If there was one thing I don't really like it is most probably like all the people in cars … because they are like quite loud and it disturbs me.' (Child A010)

Impulsivity. Children's impulsivity reduced caregivers trust in their children's ability to manage crossings independently. Caregivers, typically of younger children, discussed that they could not always trust their children in the road environment because they would run off or run across the road. Some children repeatedly asked caregivers if they could cross even when there were oncoming vehicles or repeatedly pressed the button at Pelican crossings:

> ' … he knows what to do but I wouldn't trust him to do it on his own yet. Because he just wouldn't have the patience – if he saw a gap I think he would just go … ' (Caregiver AD001)

3.3. Supporting Children's independent mobility

Caregivers thought that road safety should be taught when children were motivated, in a practical manner when they were out with children, and in small stages as it was easier for children to focus and learn the lessons. Caregivers felt that teaching road safety would be a gradual and sequential process and would involve reinforcing and repeating lessons to ensure that children could remember road safety rules:

> ' … if they're sitting in a class and they're like talking and obviously it's not going in, I think it should be like more of a practical session like they do with like bike riding and that sort of thing.' (Caregiver AD003)

Caregivers coached children how to identify safe places to cross and how to safely cross different road types and use road crossings. At crossings, caregivers often reminded participants to wait, look, and ensure that vehicles had stopped prior to crossing. Caregivers engaged with children; asking what they needed to do when crossing the road/using a crossing, enabling children to demonstrate their knowledge and abilities. Caregivers felt independent mobility required a lot of preparation, especially preparing their children for unforeseen circumstances as they felt this would cause their anxiety and reduce their ability to safely manage the situation.

Caregivers did not consistently teach children how to safely cross the road at each crossing, despite highlighting the need for consistency in their interviews. There were occasions where parents led the crossing and did not coach the participant. This may be because caregivers often mentioned that children needed to be motivated to engage in road safety. Caregivers may be tailoring their support based on child need:

> 'I do try and get him to do it but it depends where he's at emotionally. He'll often be like, "Uh, I'm not doing it," particularly on the way to school or the way [home] from school.' (Caregiver A004)

Variability. Caregivers felt that children diagnosed with the same condition may vary considerably and therefore it is not always appropriate to teach everyone in the same manner. Caregivers felt that children's level of hyperactivity and concentration could vary across the day or day to day and would alter the level of freedom they offered children in the road environment:

> ' … at the end of the day he'd be exhausted and it's then sometimes irrational behaviour could come out.' (Caregiver A010)

There was a slight tendency for caregivers of children attending SEND schools to report road safety was not being taught or to be unsure whether it was covered. A couple of caregivers of children at SEND schools did report the school supporting children with accessing the community and felt it may be covered as part of this. Participants attending SEND schools were more often in secondary school and this may account for the lower engagement with road safety as it is more often a focus in primary schools.

Resources. Caregivers were not using any road safety resources. Caregivers felt that school support with travel training was valuable as children were more likely to listen to their teachers:

> ' … that it's being taught not just by a parent but by a teacher … children have selective hearing to parents.' (Caregiver A010)

Some caregivers and children reported the school did not teach road safety and some said the school had taught road safety as part of social development or in more formal lessons. Some caregivers were unsure whether the school had taught road safety or not.

Others. Family relatives also taught children road safety when they were out with them, including grandparents and siblings, providing other role models. However, siblings were seen running ahead, running across the road, texting while crossing the road, or walking on the edge of the pavement. Children ran across the road when there was a crossing patrol officer. Caregivers and grandparents were seen cycling on the pavement.

4. Discussion

Providing early support with independent mobility for children with SEND has a significant social and economic impact; providing opportunities to socialise, engage with the community, and travel to places of study or employment. In line with the finding that fewer primary school aged children are walking to school (Cox, 2020), younger children were not travelling independently in the present study. However, younger and older children were anxious regarding travelling in their local community. There were few age-related differences. Overall, younger and older children with SEND demonstrated unsafe behaviours in the road, had limited awareness at times of road safety, may become overwhelmed, and required longer to process information. The presence of SEND may result in a

more protracted course of development of the cognitive and social skills required for independent mobility. This is a pattern that may be more characteristic of children with SEND. Typically developing children evidence gains in their cognitive and behavioural control as they approach adolescence (Prencipe et al., 2011), but children with SEND often continue to find cognitive and behavioural control a challenge, which can impact their road safety (Tabibi et al.2021).

Building on prior work that suggested inclusive universal education approaches are effective (UNESCO, 1994), this research suggests that independent travel training should focus on behaviours that children are presenting that may impact road safety and independent mobility (e.g. anxiety or awareness of danger) across SEND diagnoses, rather than focusing on specific SEND groups. Although there were some disorder specific behaviours (e.g. running ahead was more common in an ADHD profile and wanting to be accompanied in the roads was more common in an autism profile), these behaviours were not universal and children often had multiple diagnoses with overlapping profiles and impacts on road safety. Further, the presentation of these behaviours may vary with age (Steinberg et al., 2008). For example, impulsivity in younger children may present as running across the road and in older children as repeatedly pressing the button at the crossing. However, their impacts on safety are the same e.g. crossing before it is safe to do so.

The findings highlighted some recommendations for effective travel training methods. Caregivers wanted to support their children to be independent but felt they needed to build their confidence and trust in their child's ability. Caregivers, generally, are worried about the dangers of their children travelling in the local environment (Cox, 2020). This may be a more prominent concern for caregivers of children with SEND due to the impacts of their conditions on their road safety. Parents of children with SEND, unlike parents of typically developing children, report that they are anxious of the impact of SEND on children's road and personal safety (O'Toole and Christie, 2019). Further, children themselves, particularly those with autism, were often highly anxious about independent mobility and resistant to travelling independently. Children needed to be emotionally ready and motivated for travel training and training needed to be tailored to an individual timeline. Children may be more engaged when they are autonomously motivated (Reeve, 2002). That is, children will be more engaged and perform better in independent travel training if their internal goals surround being independent. This raises questions around whether parents and children themselves perceive independent mobility as possible or safe in the context of their diagnoses; this is an important question for future research.

Teaching road safety while out walking and in short bursts was felt to be the most effective method in the context of children's limited attention, challenges with abstract constructs, and limited information processing and memory capacity. Caregivers felt children often knew how to cross the road but failed to implement this knowledge if they were distracted, impulsive, or overwhelmed. Indeed, children with ADHD take longer to decide when to cross and demonstrate more unsafe crossings than typically developing children (Tabibi et al., 2021), indicating that failure to implement road safety knowledge is heightened in children with SEND. Unforeseen circumstances (e.g. late bus) were sources of anxiety for caregivers and children. Providing children with opportunities to practice road crossing and manage unforeseen circumstances under the supervision of an adult may assist children in being able to consolidate and adapt to different scenarios - an approach found to be effective with typically developing children (O'Toole and Christie, 2019).

Caregivers, particularly those of children attending SEND schools, often reported a lack of awareness of whether road safety was covered at school. Fantuzzo et al. (2004) found that building links between school and home in teaching independent mobility may be effective as caregivers believed children were more likely to listen to their teachers. Providing caregivers with informal updates (e.g. via school diaries/parents evening) in relation to road safety skills taught at school, especially if this is linked to aims and targets of being independent in the child's EHCP, may facilitate these links. There were examples of the school reinforcing road safety lessons when the caregiver reported an incident on the route to school. To further support home-school links, 'homework' tasks could be set for families to complete in relation to independent mobility (Ávila Daza and Garavito, 2009). These should be reflective of family's needs (Howland et al., 2006) and could be easily undertaken during the walk to school (e.g. child identifies which directions to look for cars when crossing).

Bridging home-school links would further ensure children are receiving correct and consistent messages. Caregivers did not always coach children at every crossing and at times incorrectly used crossings or demonstrated unsafe crossing behaviour. However, it is important to differentiate between unsafe behaviour and higher-level road safety ability. An individual may cross at a Pelican crossing without relying on the lights but cross safely. This may evidence higher skill. Though, incorrect crossing use was often instigated by caregivers and not child led, suggesting that it was not always evidence of children's skill progression. Thus, it is vital to assess the skill level of the child to determine whether ideal crossing always needs to be modelled and adhered to. A further reason for inconsistent behaviour in the road environment may be due to child motivation to learn. Road safety education may provide a practical context for children to develop cognitive, emotional and social skills. Thus, children's impulsivity and enthusiasm may be chanelled in safe and productive way. For instance, when children are learning self-regulation strategies (at school or home), road safety coaching may provide a real-world practice context.

Other individuals, such as siblings, wider family, and crossing patrol officers, may represent important role models/educators of road safety. Engaging with wider family and crossing patrol officers to promote road safety may enable more consistent road safety messages to be passed onto children. Prior research has found that parents often look to the school to provide road safety education and there are often challenges in recruiting enough caregivers to support school-based road safety training (O'Toole and Christie, 2019). Enlisting wider family and crossing patrol officers would therefore address this issue. Future research exploring parent views around who is responsible for teaching road safety (e.g. parents or schools) and identifying motivations and barriers to parent road safety education would assist in unpacking this finding.

Limitations.. The sample was diverse in relation to difficulties and disorders which prevented needs-specific analysis, so the study may have overlooked the extent to which behaviours such as impulsivity or attentiveness are a greater factor in the road safety education of children with a specific need (e.g. ADHD) versus others. Further, visual and auditory impairments were not considered in

this project and the authors acknowledge that specific adjustments to independent travel training may be required in relation to these impairments (Sauerburger and Bourquin, 2020). The majority male sample reflects the gendered nature of SEND, which may mean gender differences have been missed. We note, however, that in the general population males are more likely to be killed or seriously injured on the roads (O'Toole and Christie, 2018). In addition, the study did not include a control group of typically developing children. Future work should compare the road safety behaviour of children with and without SEND in order to explore the similarities and differences in more depth.

Conclusions and Policy Implications. Targeting specific behaviours may be a more effective approach of teaching road safety than teaching to a particular need. That said, there is value in further research involving a larger sample of children and young people to understand how behaviours and traits such as impulsivity, distractibility and assessing risk, interact with road safety, and use this evidence to inform a broader based road safety curriculum that is more attentive to the needs of those with SEND. With the specific reference to independent mobility in the updated SEND Code of Practice, greater support may be provided by schools (DfE, 2020). Promoting home-school links in relation to independent mobility may reinforce lessons and ensure consistency. In line with the key point in the SEND Code of Practice (DfE, 2020) that 'the transition to adulthood is not a one-off activity', independent mobility education may need to be repeated throughout the child's life, especially at key transition points (e.g. transition to college) as they may face new challenges. In this sense, road safety education for children and young people with SEND is a process, not an event. It requires schools/caregivers to provide on-going training, coaching and opportunities to practice road-crossing, in addition to whole school or whole year group sessions. A number of actions would support children safe independent mobility such a:

- Developing an assessment of child competence for caregivers and professionals to track children's road safety level.
- Identifying others who can reinforce road safety lessons (e.g. siblings, crossing patrol officers, teaching assistants).
- Providing a guide on skill areas to develop and how these may be impacted by specific behaviours.

These recommendations are not necessarily specific for SEND populations. For example, repeating road safety lessons across the lifespan, ensuring role models provide consistent examples of safe behaviour and practical and gradual exposure to the roads have also been found to be effective methods of teaching road safety to typically developing young people (O'Toole and Christie, 2019). However, the benefits may be greater for young people with SEND as they often demonstrate greater challenges processing when it is safe to cross and more risky behaviour than their typically developing peers, especially in complex traffic situations (Tabibi et al., 2021).

Author statement

Sarah E. O'Toole: Conceptualization; Data Curation; Formal Analysis; Funding acquisition; Methodology; Project administration; Writing - original draft; Writing - review and editing, **Rob Webster:** Methodology; Writing - review and editing, **John Butcher:** Methodology; Writing - review and editing, **Nicola Christie:** Conceptualization; Funding acquisition; Methodology; Writing - review and editing.

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