Routledge
Taylor & Francis Group

Journal of Adventure Education and Outdoor Learning

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/raol20

‘A new adventure’: a case study of autistic children at Forest School

Samantha Friedman, Jenny Gibson, Catherine Jones & Claire Hughes

To cite this article: Samantha Friedman, Jenny Gibson, Catherine Jones & Claire Hughes (2022): ‘A new adventure’: a case study of autistic children at Forest School, Journal of Adventure Education and Outdoor Learning, DOI: 10.1080/14729679.2022.2115522

To link to this article: https://doi.org/10.1080/14729679.2022.2115522

JOURNAL OF ADVENTURE EDUCATION AND OUTDOOR LEARNING
https://doi.org/10.1080/14729679.2022.2115522

'A new adventure': a case study of autistic children at Forest School

Samantha Friedman [a], Jenny Gibson [b], Catherine Jones[a] and Claire Hughes[a]

[a]Centre for Family Research, University of Cambridge, Cambridge, UK; [b]Faculty of Education, University of Cambridge, Cambridge, UK

ABSTRACT

Spending time in nature has benefits for wellbeing in children, but relatively little is known about how autistic children experience nature. Framed by self-determination theory, this case study addresses this gap by exploring the experiences of 25 autistic children participating in a Forest School at their specialist school in the East of England. We used deductive reflexive thematic analysis to analyse participant observation and parent and child interview data. Our results indicated that Forest School benefited these autistic children through opportunities to play, exercise autonomy, and develop practical, motor, and social skills. However, challenges were also evident, including children absconding and conflict between peers. The success of sessions seemed contingent on adherence to routines and the influence of the adults present. Our findings supported the application of self-determination theory to Forest School to promote psychological wellbeing through autonomy, competence, and relatedness in autistic children. We discuss implications for training and practice.

KEYWORDS

Autism; Forest School; nature-based learning; self-determination theory; reflexive thematic analysis

Introduction

Spending time in nature has benefits for wellbeing in children and adults, such as more positive affect after exercise in nature compared with synthetic environments (Bowler, Buyung-Ali, Knight, & Pullin, 2010) and improved mental health and attention (McCormick, 2017). However, relatively few researchers have considered the impact of nature on autistic children's wellbeing. Autism is a heterogeneous neurodevelopmental condition traditionally 'characterised by difficulties with social communication and social interaction and restricted and repetitive patterns in behaviours, interests, and activities' (American Psychiatric Association, 2013). Recently, Bottema-Beutel, Kapp, Lester, Sasson, and Hand (2021) have suggested that to avoid perpetuating ableist perspectives in research, practice, and everyday life, these difficulties are better viewed as differences. The autistic profile also often includes additional sensory needs and a desire for sameness. Autistic people sometimes have co-occurring conditions, including attention deficit hyperactivity disorder (Lai et al., 2019) and intellectual disability (Charman et al., 2011). Importantly, while autistic people experience mental health problems at a higher rate than neurotypical people (Lai et al., 2019; Vasa, Hagopian, & Kalb, 2020), they receive less mental health support (Maddox et al., 2020). Improving wellbeing in this community is therefore a key priority for research.

Reflecting the reduced risk of viral transmission in outdoor settings (Institute for Outdoor Learning, 2021), long-established nature-based learning methods—including outdoor play,

CONTACT Samantha Friedman saf64@cam.ac.uk Centre for Family Research, University of Cambridge, Cambridge, UK
Supplemental data for this article can be accessed online at https://doi.org/10.1080/14729679.2022.2115522

structured environmental education, and Forest School (FS)—have risen in popularity as a result of the Covid-19 pandemic. Findings from quantitative research suggest that time in or near nature benefits children's mental health. For example, Maas et al. (2009) examined general practitioners' electronic medical records for over 47,000 Dutch children (aged under 12 years) and found a negative relationship between residential green space and depressive symptoms. Likewise, in a study of 2909 Scottish children (mean age = 4.85 years), Richardson, Pearce, Shortt, and Mitchell (2017) reported that boys with no private garden access were more likely to experience peer and conduct problems. For girls, more natural space near home was associated with fewer hyperactivity problems, peer problems, and total emotional and behavioural difficulties; interestingly, socioeconomic status did not either amplify or attenuate these positive relationships between access to nature and mental health/child adjustment. More recently, Friedman, Imrie, Fink, Gedikoglu, and Hughes (2021) surveyed parents of 376 young children (mean age = 6.1 years) and found that while most of the children showed an increased connection to nature during the first UK lockdown period of the Covid-19 pandemic, those whose connection to nature decreased in this period also displayed more emotional and behavioural problems.

There are many ways of engaging with nature at school, and nature-based learning (i.e. educational experiences that take place in natural spaces) offers many benefits (MacQuarrie, Nugent, & Warden, 2015). For instance, instruction in outdoor settings has been linked to higher academic attainment in core academic subjects, including science and maths (Khan, McGeown, & Bell, 2020) and reduced 'off task' behaviour (Largo-Wight et al., 2018). In a study of 35 Turkish 5-year-olds who completed a 10-week outdoor education programme, Yıldırım and Akamca (2017) reported substantial improvements in cognitive, linguistic, social-emotional, and motor skills. However, there are also many barriers to engaging with nature at school, including cost, available space, and the attitudes of adults (Waite, 2011). Implementing a formal nature-based programme with trained practitioners, such as FS, may be one way of overcoming the hesitancy that some classroom teachers feel towards taking children outside at school while allowing children to experience an ethos that differs from the formal educational environment.

FS is a child-centred, holistic ethos that embraces a constructivist approach to learning through the natural world (O'Brien & Murray, 2007). Possible session activities include fire building, tree climbing, den building, and various types of play (Knight, 2011). One aim of FS is to counter the typical position of power that adults hold over children in educational contexts; FS leaders are formally trained and responsible for tailoring sessions and materials to children's interests (O'Brien & Murray, 2007). This training process varies depending on the training provider but typically takes around one year to complete and involves both hands-on, in-person skills assessment, a written portfolio, and delivery of FS sessions observed by the trainer. In the UK, the Forest School Association monitors the adherence of provisions and sets standards regarding the frequency, length, and location of FS sessions (Knight, 2011). FS offers a range of benefits to children, including a break from typical indoor instruction (Coates & Pimlott-Wilson, 2019), opportunities to build relationships with nature and peers (Harris, 2017), and to develop social and physical skills (Dabaja, 2021). This research demonstrates the potential opportunities offered by FS to support children in many ways; however, existing research often relies on short time periods and relatively homogenous groups, such that more longitudinal research that includes diverse samples is needed.

In particular, the impact of FS programmes on children with additional needs has, as yet, received very little research attention. This is a striking omission, given that nature-based learning is a promising way to promote wellbeing at school for this group by fostering self-regulation, relationship building (both with places and with peers; McCree, Cutting, & Sherwin, 2018), and attuning to individual needs (Tiplady & Menter, 2020). Evidence from the limited research on nature-based learning for autistic children suggests that outdoor education enhances communication (Morrier & Ziegler, 2018; Zachor et al., 2017) and reduces stress (Friedman & Morrison, 2021). Roe and Aspinall (2011) examined the impact of FS for children classified as showing either 'poor' (n = 12) and 'good' (n = 6) behaviour and found that FS had a restorative effect on anger,

energy, stress, and hedonic tone (effect sizes were small to medium but stronger for the 'poor' behaviour group). In a case-bounded qualitative study that, for the first time, captured autistic children's experiences of FS, Bradley and Male (2017), interviewed four autistic children and their parents and teachers and concluded that FS helped support relationship development and risk taking.

One reason to consider wellbeing-promoting nature-based learning methods, including FS, for autistic children is because these students often have difficult experiences at school (e.g. Mitchelson, Adams, & Simpson, 2022; Pellicano, Bölte, & Stahmer, 2018) that are related to exacerbated mental health problems (Goodall, 2018). In mainstream settings, autistic young people report unmet needs, misunderstandings from staff and peers, and distressing sensory environments, amongst other challenges (Brede, Remington, Kenny, Warren, & Pellicano, 2017; Goodall, 2018). Autistic children and young people frequently report being bullied, perhaps because of social differences from peers (Cappadocia, Weiss, & Pepler, 2012). School-based social skills interventions often aim to shape autistic children's social interactions to appear more normative and vary in how successfully they produce the intended outcomes (Bellini, Peters, Benner, & Hopf, 2007; Einfeld et al., 2018). In a longitudinal study of 1364 American teenagers, Ansari, Hofkens, and Pianta (2020) found that strong student-teacher relationships during the primary years were cumulatively and uniquely related to academic outcomes and social-behavioural skills in early secondary school, underpinning the positive impact that these relationships can have. By contrast, Blacher, Howell, Lauderdale-Littin, DiGennaro Reed, and Laugeson (2014) found that autistic students (n = 36) had considerably poorer relationships with their teachers when compared with either neurotypical peers (n = 91) or intellectually disabled peers (n = 38).

Specialist provisions may offer a positive alternative for some autistic students. Brede et al. (2017) report that for the nine autistic adolescents they interviewed, the students felt more understood and able to engage at their specialist school. The authors also note that specialist provisions are sometimes more able to incorporate flexible strategies for supporting students; these include supplementary nature-based programmes such as FS. These curricular activities may provide an opportunity to attune to child interests and intrinsic motivation in ways that formal educational contexts may not.

Self-determination theory (SDT) considers the importance of social and environmental contexts in influencing psychological outcomes (Ryan & Deci, 2000). A key tenet of SDT is that intrinsic motivation encompasses 'people's inherent growth tendencies and innate psychological needs that are the basis for their self-motivation and personality integration' (Ryan & Deci, 2000, p. 68). In other words, SDT considers the factors that contribute to an individual's ability to thrive psychologically and motivate themselves; according to the Basic Psychological Needs mini-theory, the three main needs are autonomy, relatedness, and competence (Ryan & Deci, 2017). Social contexts differ in how well they meet these three needs, impacting motivation and wellbeing.

Researchers have suggested that SDT and its associated framework align well with a variety of nature-based learning philosophies from garden-based education (Skinner, Chi, & The Learning-Gardens Educational Assessment Group 1, 2012) to outdoor adventure courses (Wang, Ang, Teo-Koh, & Kahlid, 2007). Barrable and Arvanitis (2019) were the first to propose that SDT aligns with the FS approach (see also Petrigna et al., 2022); empirical exploration of this idea thus far is promising (Egan, 2020). When FS is carried out in a form true to its ethos, it should, ideally, provide a social context that supports autonomy, competence, and relatedness and, therefore, promotes psychological wellbeing and intrinsic motivation. As SDT is commonly applied to research with autistic people (e.g. Goldfarb, Golan, & Gal, 2021), it makes sense to apply SDT when considering the impact of nature-based learning techniques on autistic children. While there are alternative theories available to explain the benefits of FS (e.g. attention restoration theory, Kaplan & Kaplan, 1989; stress recovery theory, Ulrich et al., 1991), SDT aligns with the child-centred philosophy of the FS approach more closely to explain potential benefits beyond exposure to nature stimuli.

Summary

Despite the known relationship between nature and wellbeing, few researchers have formally considered autistic children's experiences in nature. Moreover, SDT has not yet been used to evaluate the experiences of autistic children at FS. As such, the present study is both empirically and conceptually novel. In this ethnographic case study (Merriam, 1998), we applied the lens of SDT to answer the following questions: What are the participatory experiences of autistic children at FS? How does FS impact wellbeing in autistic children? What are the perceptions of parents of autistic children taking part in FS regarding how FS supports their child's wellbeing? How might SDT explain the factors which contribute to successful FS sessions?

Methods

Study design

The data sources for this case study include: (a) three months of narrative observation notes; and (b) transcripts of interviews with 10 parents and nine children. Our choice of a case study approach to investigate a group of students' experiences at one FS programme in England was justified by the clear boundaries around this case, the variety of data collection methods available, the differing perspectives included (child, parent, and researcher), and the extended time spent with the participants. As focusing on just one data source would yield an incomplete picture, we triangulated the data sources to enhance the complexity of our conclusions (Tracy, 2010).

Participants and procedure

Parental consent was obtained to observe 25 autistic children (mean age = 9.8 years old at time of observation) while they participated in FS and during their indoor academic lessons. The children and their parents were also invited to participate in interviews: 10 parents agreed to participate and for their child to also be interviewed (see Appendix 1 for child ages and pseudonyms). All but one child agreed to be interviewed; observational data but not interview data are available for the child who did not assent. Appendix 2 presents interview questions for both parents and children.

The primary researcher undertook data collection, following training in safeguarding and in the research methods used. Interviews with parents were conducted in autumn 2020 while child interviews were conducted in April 2021. Following advice from parents, child interviews took place in person on the day of the FS sessions in a location of the child's choosing, including the FS site, the school playground, a sensory room indoors, and an open concrete space near the school building. Interviews were semi-structured as we allowed participant engagement to guide the interview. To make their participation feel enjoyable, the primary researcher asked about child interests to build rapport and moved on from questions that were not eliciting a detailed response or that seemed to frustrate the child. The familiarity between the children and the primary researcher likely made the child interviews easier to facilitate. To adhere to social distancing guidelines in place in the UK at the time, parent interviews were conducted via Zoom or phone call.

Observation notes for all 25 children in the study were based upon observations conducted between September and December 2020. During this time, the primary researcher attended approximately 75% of FS sessions and observed the children in their classrooms several times; this extensive contact enabled informal within-child comparison between general behaviour indoors versus at FS, although indoor observation was less frequent due to risks from the ongoing Covid-19 pandemic. The primary researcher wrote narrative field notes (Allen, 2017) about children whom we had consent to observe following each FS or indoor classroom session. In the first few weeks of observation, a focus child was selected for each session and more detailed notes were taken on this

child (with less-detailed information being noted about other children). As time went on, however, we opted to divide time for observing the consented children equally. Additional contextual notes were taken, keeping other children anonymous, to provide a clearer picture of what was observed. Upon returning home from the school each day, the primary researcher typed these notes into a document and expanded upon them while the observations were still recent. Field notes were separated by class session and written in bullet points, with some points being full paragraphs and others being shorter statements. Appendix 3 presents a sample of these field notes.

Ethical approval and procedures

Ethical approval was received from the University of Cambridge Psychology Research Ethics Committee for all parts of the case study. Parent consent was provided for the participant observation, parent interviews, and child interviews. Child assent was gathered from the children prior to starting the interview. Child assent, through the form of behaviour or vocalisations indicating that they did or did not want people around them, was respected during participant observation. Parents received Participant Information Sheets about all three parts of the study; we also sent a child-friendly version of the information sheets (see Appendices 4 and 5).

Data analysis

Both observation notes and interview transcripts were coded and analysed thematically using Braun and Clarke's (2006, 2019, 2021) reflexive approach. Data were deductively analysed by the primary researcher using SDT as a broad theoretical guide. This began with the transcription of the parent and child interviews, the first step of data familiarisation. Following transcription, the primary researcher conducted close re-readings of the transcripts with the research questions in focus while listening to the audio recordings. This enabled a list of initial ideas about the data to be generated, yielding codes that, having revisited the transcripts, were then sorted into candidate themes. The primary researcher developed thematic maps to make sense of the themes and ideas before revisiting the full data set and re-reading all interview transcripts to identify any changes that needed to be made to the list of themes. The same in-depth process was followed to analyse observation notes. Rather than presenting the themes from each data source independently, similar themes from the data sources were integrated together into one coherent picture.

The primary researcher then defined and refined the list of themes. This process helped to ensure that the themes were all clearly delineated before writing up. To enhance the rigour of the work, and in line with recommendations from de Kleijn and Van Leeuwen (2018) and Flick (2014), two researchers (SF and CJ) audited the data. SF and CJ met to discuss the data and analytic choices, with CJ serving as the auditor as she has disciplinary expertise (developmental psychology and wellbeing) but also objectivity given her distance from the specific topic of research.

As noted by Braun and Clarke (2021), acknowledging the researchers' positionality in a reflexive way is core to this type of thematic analysis and, indeed, important for qualitative research more generally. SF designed the study alongside JG and CH, collected the data, and carried out the analysis, with support from JG, CJ, and CH. SF is a researcher in the fields of Education and Psychology, with a background working with autistic people. She is also a qualified Level 3 Forest School leader and so believes in the value of nature-based learning. SF aligns with a constructivist epistemology (Constantino, 2008) and a critical realist ontology (Braun & Clarke, 2021; Stutchbury, 2021). These perspectives and experiences shape the findings in the present study.

Findings

Context

The FS at the specialist school is accredited by the Forest School Association and run by a qualified Level 3 FS practitioner, Julie (all names are pseudonyms), and a Level 2 FS assistant, Heather. At the time of the study, both Heather and Julie had at least five years of experience working with autistic children and at least three years of experience working in FS contexts. Students in the primary grades at the school accessed FS on a weekly basis across the entire school year. Two features of this FS deserve note. First, the FS staff were employed by the school and had expertise in both the FS approach and in working with autistic children. This combination of skills is uncommon and offered an opportunity to consider how autistic children experience nature when surrounded by other autistic children and supported by FS staff with extensive knowledge of autism.

Second, the FS was located within school grounds, approximately a three-minute walk away (see Appendix 6). The site had two log circle areas (noted by stars in Appendix 6), various trees, nettles, and plants, and a pond. After meeting the FS leaders at the school gate, each class walked to the FS site, were let into the site by a teacher, and sat around the log circle for the opening meeting. The children were then released to do whatever they wanted. The sessions ended with a bird call from the FS leaders that indicated that children should come back to the log circle for a closing meeting. The FS leaders examined the site daily for potential hazards, and children were taught to assess for risk as they engaged in activities like climbing trees and playing near the pond. Children who wanted to use tools (e.g. hammers, knives, pull knives, and spades) had to first ask an adult, who would review the rules of the tool with the child and monitor the child's use of the tool throughout. Adults at the FS used walkie talkies to call for assistance or to alert others if children absconded from the site. The FS leaders had updated wilderness first aid training and carried a first aid kit and any medications the students might need (e.g. inhalers and EpiPens).

Based on interviews with autistic children and their parents and three months of participant observation both in Forest School and inside, several themes were developed to answer the research questions: excitement and freedom of being beyond four walls; FS affords opportunities for positive development; feelings regarding nature and FS are conditional and subject to change; rituals are important for all but must be tailored; attitudes of adults help or hinder sessions.

Theme 1: excitement and freedom of being beyond four walls

For some children, FS was beneficial because it was an entirely unique environment with different expectations compared with those faced by children in a traditional school day. While school environments often appear unsupportive, with frequent demands marring autistic children's experiences, FS was, according to Sophie, a place to explore. Despite the FS site being on school grounds, the children viewed FS as a world of its own that afforded varied opportunities each week. Mia reported that 'I feel surprised when I get there because you never know what's going to happen at FS … it's a new adventure.'

Sophie's mother, Rosie, said that based on her understanding of what happens at FS, 'the kids can get on and do what they want. There's an element of freedom. There's not someone saying, "you're doing it wrong … "' Similarly, the ability to act autonomously at school (within reason regarding safety) without fear of getting in trouble helped children to feel more open to exploring the FS site and engaging in various activities. Mia noted that she enjoyed FS because 'you're in a school area, and you're not breaking any rules, but you also get to be free.'

This continued novelty was appealing to many of the children. The FS site was also the host of a variety of imaginative games; Sophie said that her favourite activity at FS involved hunting for Bigfoot in the 'caves' around the FS site. Jack reported that one of his favourite FS memories was sitting around the fire circle with his class making up a story by passing it along to each person in the group to contribute. On the day Jack was recalling, the story developed a plot line about 'greedy

corporate pigs' who were actual pigs as well as 'space dragons.' This story game was an opportunity for Jack and his peers to demonstrate their strong imaginations.

For Alexandra, who had a strong need to stimulate her vestibular system through spinning and moving, FS was a place to be active. While at school, she said she often spent time outside of the school building climbing trees or moving throughout the school grounds rather than engaging in lessons. When at FS, however, Alexandra could engage in physical activity in a way that was accepted and encouraged without having to ask permission to do so. Alexandra frequently spun on the swing, walked around the site, and moved in other ways that satisfied her sensory needs in a non-stigmatising or disruptive way. When delivered in its intended form, FS is a child-centred approach wherein adults allow participants to have autonomy over what they engage in during the session.

Theme 2: FS affords opportunities for positive development

We observed various types of play, including both independent and with peers, development of practical, social, and motor skills, and a chance to connect to nature. These opportunities helped to contribute to the development of competence in addition to promoting relatedness with others and the physical space. This theme is explained through three subthemes.

Subtheme 2.1: diverse play and peer interaction. For one class, play was an incentive for children to engage in FS each week; the promise of being able to take one child's remote-controlled car out to the FS site was reason enough for several begrudging children to leave the classroom. Imaginative play featured often in the FS setting with children pretending to use construction machinery to move mud or run a hotel. At times, the FS site saw a continuation of typical patterns of play and interaction; at other times, children saw the FS site as an opportunity to play more freely and test out interactions with different peers in a low-stakes environment.

FS provides a space to be outside with peers in a context that is understanding of autism and the specific needs and strengths of the children. While parents differed in their knowledge of what FS entailed, they were united in identifying the value that it offered to their children. Ellen noted that:

> I didn't really know much about what it would do educationally, but I knew it would be something he'd love. Because, certain things he can't access normally, like going to Scouts or whatever. He just cannot access that. But all of the things that he would enjoy about that are the sort of things you do at FS.

Subtheme 2.2: engagement and connection with nature. Several parents expressed appreciation for FS as one of the only opportunities for their child to get outside and engage with nature. While some children were simply too tired during term time to play outside, other parents noted that the transition from home to the playground or park was often too stressful for everyone to be worthwhile. Barbara said,

> FS has enabled her to have access to a world that she, we haven't got energy to force her into, if that makes sense. Because there's a lot of other factors, stressful factors in the family that make that too difficult to fight that battle.

In addition to opportunities to build relationships with peers and nature, FS promotes a sense of connection to a physical space as children became attached to the FS site. Spending several hours per week in the space allowed the children to attune to the changes that occurred because of weather or due to the actions of other classes. They developed relationships with specific features of the FS site, such as Oliver who said that 'I remember that in the FS [site], I have a tree to myself . . . it's called [Oliver's] tree.'

Subtheme 2.3: skill development and sensory changes. FS also supported children in building competence through skill development of various kinds. This included fine motor and practical outdoor skills, observed through den building with tree branches and tarpaulins, creating a mudslide

with spades and buckets, and wood carving using pull knives. Children also practiced social skills, including opportunities to demonstrate affective empathy; John's mother, Kirsty, said,

> one of the positives for [John] is that he's come home and wanted to share marshmallows with one of his friends who's a vegan . . . and obviously sharing's a huge thing. So whilst it seems like a silly part of FS, actually, I think for [John] it's quite important because it felt good to share.

Developing mastery over these skills provided the opportunities for children to feel proud and develop confidence.

FS also allowed children to address sensory needs using a range of strategies; for example, when Alexandra felt overwhelmed during one session, she sat alone in a hammock for much of the time. Other children opted into more complex sensory input, such as when Theo, Mia, and others built and used a mud slide. Children sometimes took off their wellies and socks to walk through mud or water barefoot; these sensory-stimulating inputs allowed children to meet varied sensory needs. FS also seemed to offer a space to try out new activities and foods. Barbara said that her daughter's food preferences changed outside, as she 'would never eat beans at home but she would take in a tin of beans and cook it over the fire' when she started at FS.

Theme 3: feelings regarding nature and FS are conditional and subject to change

The largely positive narrative about experiences at FS begins to get complicated when factors such as mood and weather are considered. On cold or rainy days, some children appeared reluctant to change into their kit for FS. Additionally, several children did not have appropriate clothing for rainy or cold weather, making their experiences at FS in this weather uncomfortable. Sophie said that she likes nature 'except when it throws at you. Like "oh what a beautiful day! (pause) It's raining."'

Several children also noted that they enjoyed FS more when they were in a good mood, though nature also helped some to feel calmer if they were sad or upset. However, this was not always the case, and being in nature did not automatically result in being in a good mood or feeling able to self-regulate effectively. Joseph mentioned that

> My opinion on nature changes with my emotion . . . when I'm happy, which is most of the time, I kind of like nature . . . Although, in the past when I went into (makes loud, angry noises) mode, I, I, if- considering how destructive I am in that mode, I've never really been around nature in that mode. But, if I was, I'd probably just go like "ARGH!" on it and just destroy, destroy the thing that was- destroy the nature thing.

Multiple parents and children noted the difficulty that the transition to going outside can pose, both when attending FS and spending time outdoors with family. Despite this, Ella said that 'I've noticed that I don't- I always say I don't want to go to FS but when I'm in FS, it makes me happy.'

Some of this hesitancy may be due to fears or uncertainties about the FS site itself and animals that might live within it. Sophie said that the outdoors sometimes makes her feel scared. Similarly, when asked about her initial feelings about FS, Mia shared that

> I was kind of scared because I didn't know what lived there . . . [after the first session, I was no longer scared] because they popped up these night cameras that showed it- they took pictures of movements and we know that foxes and badgers live there . . . foxes can bite off your lip, but no I'm not scared [of them].

Thus, FS is unlikely to always benefit all autistic children. Jack, who expressed an enthusiastic love for FS, shared that he thinks that 'FS should be optional . . . because sometimes I really don't want to go into the forest . . . I wish it could be like if you want, you can come to FS today.'

Theo described FS in negative terms, recalling one time that he felt he was scolded unjustly for doing something that he felt was not a violation of any FS rules. According to Theo, he's 'never liked being outside that much' and when he is outside, '[I] definitely don't feel happy.'

Additionally, even amongst the benefits, the primary researcher observed children absconding from the site, refusing to attend the sessions at all, or engaging in physical and verbal conflict with peers and teachers. In some instances, circumstances at the FS session made the setting inhospitable for the student (e.g. peer conflict or being stung by nettles), causing them to remove themselves

from the site. Absconding sometimes occurred due to boredom, according to several children who left and were made to come back.

As emphasised by one father, Andrew, participating in a FS session should not be viewed as a panacea:

> So last week's FS, for example, was a disaster and resulted in several hours of meltdown and restraint. Because she planned a prank on the FS teachers that didn't quite work for complicated reasons to do with other children and that resulted in a whole series of things going quite wrong so she had a terrible day. And so just the fact that it's FS doesn't necessarily mean that it's going to be an easier time or a better time.

By contrast, several other parents said that they believe their children have better days when they've had FS; Ellen referred to FS as the best part of her child's experience at the specialist school.

Theme 4: rituals are important for all but must be tailored

To reduce the potential challenges and most efficiently access the benefits, several habitual activities seemed important. For all eight classes, fire was an important element of the FS experience. For some classes, the process of building the fire was an activity they came to rely on each week, with children working alongside their teachers and FS leaders to develop their fire-lighting skills. Successfully lighting a fire was a moment of pride for children as they celebrated their competence in this skill; an inability to get the tinder to catch fire could also be a cause of frustration or conflict. In other classes, the drawn-out process of getting the fire going meant children lost interest in being at FS, sometimes due to a lack of warmth or an inability to cook food. Julie and Heather were attuned to the needs of each class and ensured that they set the groups up for success by meeting their individual needs. For some classes, this meant having the fire already going ahead of the session; one child specifically requested that the fire be started before his session so he could start cooking right away.

Food was a recurrent feature of almost all FS sessions. When noting his favourite things about FS, Joseph said 'Especially the food . . . that time when I first came there, I thought it was . . . pretty cool to be able to like . . . cook your food on the actual fire.' He noted that he specifically enjoys making canned chicken soup over the fire each session. For one class, the process of making damper bread on the fire was central to their enjoyment of FS. Through observations, it seemed that this class, which often struggled with conflict between students, used their time around the fire cooking their bread to connect with each other; in one session, the conversation ranged from football to their diagnoses of autism and pathological demand avoidance. Additionally, roasting marshmallows was a popular activity and often was important in getting children to stay through the whole session. Children were not allowed to roast marshmallows until the fire was hot enough, which meant that the activity was left until the end of the session. This incentivised children to stay throughout the session to enjoy this treat.

Other recurrent activities included the games that the children engaged in as well as typical movement patterns (e.g. staying near the fire circle at the start of the session or immediately dispersing around the site). While certain classes were asked not to bring 'indoor' items into FS, others were permitted to do so as Julie and Heather recognised the role of these items in enabling students to engage with FS (e.g. plush toys, remote cars). The FS leaders demonstrated an understanding of each classes' needs and anticipated the unique routines that generally contributed to a successful session each week. As such, they played an important role in ensuring that some of these rituals, such as food, fire, and play, were possible each session.

Theme 5: attitudes of adults help or hinder sessions

As FS is child-centred, it still requires the presence of adults, including additional class staff to meet the required child-adult ratios specified by school risk assessments. In addition to the FS leader and assistant, several teachers and teaching assistants attended FS sessions with their classes. This meant there were sometimes six adults, including the researcher, present at a FS session with 3–10 children. Despite this high ratio of children to adults, more adults did not mean fewer challenges or less social

conflict, particularly when adults were not communicating effectively. For instance, during one session with a class that had just two students, there were five adults present. One of the children became upset and began to physically target a teacher. The other child in the class was largely ignored because all the adults were attending to the child who was upset.

The adults also helped children navigate tricky social situations and facilitate positive interactions. In one session, Heather recognised Alexandra, who typically was engaged and active at FS, was subdued and seemed upset. Heather invited Alexandra for a walk around the site, knowing that walking was a calming strategy for Alexandra. After returning from their walk, Alexandra moved closer to the fire and was slightly more engaged with the group; she was not back to her usual self but seemed to be less anxious. Heather's knowledge of each child's needs and ability to intervene at an appropriate level was key in supporting this child. Alexandra shared that 'sometimes I've been able to talk about stuff that's making me upset in FS. And sometimes FS, the actual site, has made me feel calmer . . . I trust [the FS leaders] with most things.'

The seemingly secure and healthy relationships that the FS staff had with most of the children did not go unnoticed by parents. Mia's mom observed that 'they've got great staff there as well. I mean . . . they're great . . . That's half the battle, isn't it? Having teachers you want to hang out with, teachers that are fun.'

The teaching and leadership style of the adults at the session greatly influenced the children's experiences, creating either autonomy-supportive or autonomy-hindering contexts. In one class, the class staff had a more hands-on approach and preferred to have their students within sight during the session (though this was not a FS rule). During one of their sessions, there were fewer adults attending than usual. The children seemed to engage more extensively in imaginative play and moved throughout the site freely; for instance, two students spent much of the session out of sight of adults pretending to run a hotel from underneath a wooden structure in one corner of the site. For this class, having fewer adults seemed to allow more autonomy.

FS is a child-centred ethos that emphasises child autonomy and a shift in the typical adult-child power dynamics of formal education settings. Julie and Heather seemed to carefully decide when to follow the FS approach in this way and when to intervene to prevent unsafe behaviour. For instance, a certain amount of risky play was allowed under the observation of the FS leaders and after reviewing the rules. This included starting fires, cooking food, using knives and spades, and climbing trees. When behaviour moved from risky to dangerous, however, Julie and Heather took immediate and direct action to prevent harm to the child or their peers. During one session, Alexandra became upset and began to throw things; the adults mobilised to block her access to knives, saws, hammers, and the fire. Throughout the entire observation period, none of the children sustained injuries at FS.

Even FS leaders like Julie and Heather, who seemed to provide autonomy-promoting FS sessions, were not always supportive of the needs of every child due to needs fluctuating and being difficult to identify; this was the case with Theo, who had only negative things to say about the FS leaders. When asked what he liked to do at FS, he said 'sit down and try to get as far away as possible from Julie and Heather' because they 'are very strict . . . they always tell me off for doing nothing.' This underpins that the FS ethos is child-centred rather than child-led as adults have a clear influence on children's experiences at FS. As with seemingly all aspects of FS, autistic children's experiences and relationships with the FS leaders and other adults were highly varied.

Discussion

Through three months of observation, interviews with parents, and interviews with children we found that FS sessions provided autonomy to children, promoted competence through scaffolded skill development, and helped to facilitate relatedness through varied types of play and interaction. Sessions were contingent on the adults present as well as the upholding of rituals week to week. Even when routines were in place, play was happening, and adults were deferring to child interest, there were many challenges. This suggests that while FS is likely an effective support for the basic

psychological needs contributing to wellbeing for many autistic children, it will not be an appropriate setting for all children all the time nor can it be considered any sort of panacea to counter the stresses of the school experience.

SDT: supporting autonomy, competence, and relatedness at FS

The themes we developed are consistent with the view that FS creates social conditions that can be seen to facilitate 'inherent human capacities for psychological growth, engagement, and wellness' (Ryan & Deci, 2017, p. 3) in line with SDT. We perceived that the FS at the specialist school in this case study provided a need-supportive environment that promoted autonomy, competence, and relatedness to enhance the wellbeing of most autistic children taking part. As described in theme one, *excitement and freedom of being beyond four walls*, autonomy was evident from the perspective of the children, given that various participants described how they were free to do whatever they liked when at FS. It was also observed during the FS sessions, when children engaged in various self-directed activities, from complex imaginative play to sitting alone in the hammock. It is possible that the routines of each session, illustrated by theme four, *rituals are important for all but must be tailored*, enabled autistic children to take advantage of opportunities to be autonomous within a structured environment. The influence that all adults present at the FS sessions had on child experience, reflected in theme five, *attitudes of adults help or hinder sessions*, is like adult influence in other contexts. In educational settings, adults are fundamental for creating environments that can, to varying degrees, support or hinder a child's ability to access the three basic needs of SDT (Ryan & Deci, 2017). However, ensuring that adults support the three basic needs is more important in FS settings given the child-centred, holistic aims of the FS approach. At its core, FS is a child-centred ethos (Knight, 2011); according to O'Brien (2009), this emphasis on child interest and inquiry may lead to enhancements in the child's motivation as they are likely to be more engaged when encouraged to follow their own lines of inquiry. This belief reflects Ryan and Deci's (2017) suggestions that autonomy-supportive environments facilitate intrinsic motivation. Whereas indoor educational settings may be autonomy supportive, FS offers the unique potential to promote autonomy more fully given that there are fewer demands placed on the child (Barrable, 2020; Barrable & Arvanitis, 2019).

Next, competence was apparent in theme two, *FS affords opportunities for positive development*, as parents believed that their children were learning relevant skills at FS, such as survival or building skills, and practicing social skills through play and other casual interactions with peers. Children also requested to exercise their burgeoning skills to build fires and dens, use tools, climb trees, and cook food. The development of physical skills, practical, social, and academic skills at FS has been documented in both autistic (Bradley & Male, 2017) and non-autistic children (Coates & Pimlott-Wilson, 2019; O'Brien, 2009). Children utilised their autonomy, described in theme one, to choose to opt into certain activities, including those that helped to develop a wide range of skills. Additionally, the process of overcoming fears is illustrative of developing competence. For instance, Mia's experience of viewing trail cameras to assuage her fear of unknown animals in the site is reflected by theme three: *feelings regarding nature and FS are conditional and subject to change*. In this way, the FS approach, with its freedom for children to engage in any activities they'd like and lack of judgment surrounding the development of these various skills, was a competence-supporting environment. This is particularly important when contrasted with the focus that formal educational environments typically place on test performance and meeting standards (e.g. Nuttall, 2016); emphasising this type of performance does not align with the focus that SDT puts on intrinsic motivation.

Finally, relatedness was evident in child play, their interactions with different peers, and in parents commenting that their children were developing their social skills, also captured by theme two. Additionally, the seemingly secure connections that most children built with the FS leaders, described in theme five, seemed to enable them to further develop their competence in various skills and exercise their autonomy in a trusting environment. The development of relationships with

both peers and adults is also frequently noted in literature as a benefit offered by FS (e.g. Coates & Pimlott-Wilson, 2019; Harris, 2017; Tiplady & Menter, 2020).

Practitioners working with autistic children should look to FS as a model of providing an environment that supports the basic psychological needs (Ryan & Deci, 2017). This case study lends empirical support for Barrable and Arvanitis' (2019) suggestion that SDT provides an appropriate theoretical underpinning to explain the benefits of FS.

A lower-demand environment that enhances typical school experiences

Findings in the current study echo those from research involving a six-week in-school FS programme for neurotypical children (Coates & Pimlott-Wilson, 2019). Most notably, these authors write that the children they interviewed found FS to be a break from routine that provided them freedom and autonomy at school, a novel experience for many in the context of the formal, adult-designed education system. Just as in theme three in the present study, children also spoke about gradually overcoming their initial apprehensions regarding FS and being in the woodland space. Given that autistic children often have difficult school experiences (Brede et al., 2017; Cappadocia et al., 2012; Goodall, 2018), the use of FS as a mechanism for developing positive feelings about school is promising. For most of the autistic children interviewed in the present study, FS represented autonomy, freedom, and a chance to explore, as captured by theme one. This was not the case for one child, however, as Theo's opinions of FS were overwhelming negative. As described in theme three, Theo's perspective is illustrative of the varied experiences amongst autistic children. While Theo might change his mind given more time or different FS leaders, the descriptions given by him and his mother about previous experiences outdoors suggest that nature-based activities may not be most appropriate for his interests.

Tiplady and Menter (2020) describe FS as a place where children can 'take what they need' (p. 13); similarly, as captured by theme one, many of the children observed in the present study utilised their time at FS to address individual needs. For some children, this looked like time spent alone in a hammock or other sitting area. For others, this involved physical activity or imaginative play with peers. That their only constraints were regarding safety (e.g. boundaries to the FS site, using tools safely, climbing trees only to a certain height) seemed to free the children to follow genuine interests with little intervention from adults, though this was dependent on the adults, as seen in theme five. Even social situations were generally left alone for children to navigate themselves; there were exceptions, however, such as when Heather gently intervened in situations to facilitate positive interactions and support positive relationship development.

FS hinges on the presence of qualified FS leaders and assistants (Knight, 2011). Based on the present findings, however, the impact of adults is not limited to only the FS leaders. As described in theme five, all other adults present at the session seemed to have the potential to influence the session's outcome. This adult influence underpins the importance of generating understanding and buy-in from other members of staff at FS to provide need-supportive social contexts; this is particularly important given that the attitudes of school staff regarding nature-based learning are a known barrier to engagement (Waite, 2011). Tiplady and Menter (2020) reported a positive change in relationship dynamics between children and adults, suggesting that relationship development may have been supported by the greater freedom for young people engage in activities of their choosing when at FS. The teacher-student relationship is an important contributor to a variety of outcomes including academic success and social behaviour (Ansari et al., 2020). The importance of this relationship is particularly urgent for autistic children given reports of negative experiences with teachers (Blacher et al., 2014), including feeling judged and misunderstood (Goodall, 2018). The change in setting from the indoor classroom to the FS site might have provided the opportunity for some children to build relationships with their teaching staff that were based upon the child's interests, something that was likely less possible during structured academic lessons.

Supporting positive social interaction and a desire for sameness

One often-discussed benefit of FS is the opportunity to develop social skills through the teamwork that is necessary to accomplish activities such as den building or hanging a tarpaulin (O'Brien, 2009). Given that a social impairment is one of the characteristics of autism (American Psychiatric Association, 2013), many interventions and support systems used with autistic children, particularly at school, are centred around developing social skills (e.g. Einfeld et al., 2018), though their effectiveness is questionable (Bellini et al., 2007). Regardless, the potential for nature-based learning to provide opportunities for social development in autistic children has been a compelling prospect for some researchers (e.g. Zachor et al., 2017). Indeed, several parents in the current study hoped FS could provide an environment for their child to interact with others to develop social skills and the ability to work cooperatively. Opportunities for play and development of social relationships, captured by theme two, are touted as benefits of FS (Dabaja, 2021; Harris, 2017). FS could be a means of supporting differences in social interaction in autistic children. Another possibility is that FS might provide a flexible space where typical social norms and power dynamics are different—particularly the FS in this case study, which has only autistic children as participants. This may allow autistic children to express themselves fully, through time alone, solo play, imaginative play, or building relationships with peers and adults, in a context that better understands their needs.

Also core to FS is the repetition of certain activities (O'Brien, 2009). A desire for sameness, so-called rigidity, and insistence on routine were descriptors of autism originally given by Sukhareva in 1925 (Sher & Gibson, 2021) and Kanner (1943) and are still included in the diagnostic criteria for autism today (American Psychiatric Association, 2013). The consistent structure of FS sessions might feel comforting and predictable to autistic children, allowing them a safe context in which they can take advantage of opportunities to exercise autonomy. In this way, FS might, somewhat paradoxically, present the opportunity to experience a break from the typical school day routine while also relying on the predictable structure of each session. This was evident in the current study, particularly when considering theme four. This support for the desire for routine or sameness that the basic FS structure offers has not been noted in the existing literature, though it's important to note that the utility of a deficit-based and stereotyped description is increasingly questioned (Kingsbury, Sibert, Killingback, & Atchison, 2020).

Acknowledging difficulties

Complicating previous narratives about the benefits of time outdoors and FS, the findings from this case study indicate that autistic children's FS experiences also include negative aspects. Previous research has highlighted challenges in autistic children's experiences of FS but have suggested that these ultimately benefit children. For instance, while Bradley and Male (2017) and McCree et al. (2018) mention negative aspects, these downsides are viewed as offset by other redeeming qualities offered by the time outside. Bradley and Male position challenges as an opportunity for growth while McCree et al. suggest that children expressing negative emotions indicated their having developed an ability to share their emotions in a safe space.

In the present study, theme three captures the complicated relationship some of children had with FS. While we observed instances of children working through emotions in a trusting environment (e.g. when Alexandra came to FS subdued and anxious but, after a walk with the FS assistant, seemed slightly calmer), this should not be taken to mean that all autistic children will experience FS as a calming, safe space. The present study extends the findings of previous work to present a nuanced understanding of the advantages and possible limitations of FS for autistic pupils. To avoid setting students up for failure, practitioners should consider that FS might not be appropriate for all autistic children, nor will every session run as expected. Rather, other initiatives for neurodivergent children that involve time outdoors, such as inclusive football clubs, may be more

appropriate options to meet varied needs and interests; further research is needed to explore how these programmes compare.

Limitations

This ethnographic case study is not without limitations. The case itself is bounded in a unique context; that is, the FS was based at an autism-specific school and the leaders had extensive training and experience working with autistic children. Most FS leaders and, indeed, teachers do not have this depth of expertise nor the time, money, or resources to obtain further training. Additionally, all children participating in the FS sessions were autistic, meaning that children and adults present had a better understanding of autism than a typical teacher or non-autistic peer at a mainstream school might. Experiences are likely to vary across other FS contexts, particularly when autistic and non-autistic children are participating in the same groups, as in most mainstream schools, and when FS leaders have considerably less knowledge and experience of autism. Despite this, there is still much to learn from the experiences and perspectives of these children and their parents that will translate to other FS programmes; in particular, the present research considers the perspectives of multiple informants and therefore offers more nuanced insights. Braun and Clarke (2021) suggest that qualitative research, such as this case study, be considered as potentially transferable rather than generalisable; as such, the responsibility is placed on the reader to determine what elements of the findings are applicable to their own context based upon the transparent and detailed descriptions we've endeavoured to provide.

Conclusion

The thematic findings from this study illustrate how SDT can be used as a framework for understanding the role FS can play for autistic children's wellbeing by creating an environment that is supportive of children's autonomy, competence, and relatedness. Based on the children's experiences, FS was an exciting change compared with the normal school day; however, children did not always want to engage with FS. Children seemed to experience a variety of benefits, including opportunities to spend time outside, play, and develop various practical and social skills. Some elements, like rituals and the attitude of adults, seemed to greatly impact the sessions, allowing for children to engage in diverse styles of play and peer interaction or hindering these experiences. FS sessions were not always without difficulties and did not 'solve' some of the usual problems that come along with autistic children's school experiences.

With increased knowledge about autistic children's FS experiences, guidance for best practice in supporting autistic children in FS settings can be developed. Further research with autistic children participating in FS programmes in different locations and contexts will be important to support the creation of more standardised best practice suggestions. Based on the current evidence and the influence that FS leaders have in developing their programmes, we recommend that training for FS leaders and assistants seeking qualification should include compulsory modules on supporting autistic children in FS settings.

Acknowledgments

The authors would like to thank the school for being the site of this research and the parents, children, and teachers for their involvement.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the St Edmund's College, University of Cambridge.

Notes on contributors

Samantha Friedman is a PhD candidate at the Centre for Family Research, University of Cambridge. She studies the use of nature and nature-based learning methods to support wellbeing in autistic children and is also interested in connection to nature in children more generally.

Jenny Gibson is an Associate Professor in Psychology and Education in the Faculty of Education at the University of Cambridge. Jenny's research expertise is in autism and developmental language disorders and their impact on mental health and social relationships in childhood.

Catherine Jones is a postdoctoral researcher at the Centre for Family Research, University of Cambridge. Her research explores parenting, child adjustment, and family relationships in different family types.

Claire Hughes is Deputy Director of the Centre for Family Research. Claire's research focuses on cognitive development (theory of mind and executive function), transitions to parenthood, transitions to school, and family influences on child problem behaviours.

ORCID

Samantha Friedman http://orcid.org/0000-0002-9402-7241
Jenny Gibson http://orcid.org/0000-0002-6172-6265

References

Allen, M. (2017). *The SAGE encyclopedia of communication research methods*. Thousand Oaks: SAGE Publishing.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. Arlington: American Psychiatric Pub.

Ansari, A., Hofkens, T. L., & Pianta, R. C. (2020). Teacher-student relationships across the first seven years of education and adolescent outcomes. *Journal of Applied Developmental Psychology*, *71*, 101200.

Barrable, A. (2020). Shaping space and practice to support autonomy: Lessons from natural settings in Scotland. *Learning Environments Research*, *23*(3), 291–305.

Barrable, A., & Arvanitis, A. (2019). Flourishing in the forest: Looking at Forest School through a self-determination theory lens. *Journal of Outdoor and Environmental Education*, *22*(1), 39–55.

Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education*, *28*(3), 153–162.

Blacher, J., Howell, E., Lauderdale-Littin, S., DiGennaro Reed, F. D., & Laugeson, E. A. (2014). Autism spectrum disorder and the student teacher relationship: A comparison study with peers with intellectual disability and typical development. *Research in Autism Spectrum Disorders*, *8*(3), 324–333.

Bottema-Beutel, K., Kapp, S. K., Lester, J. N., Sasson, N. J., & Hand, B. N. (2021). Avoiding ableist language: Suggestions for autism researchers. *Autism in Adulthood*, *3*(1), 18–29.

Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, *10*(1), 456.

Bradley, K., & Male, D. (2017). 'Forest School is muddy and I like it': Perspectives of young children with autism spectrum disorders, their parents and educational professionals. *Educational and Child Psychology*, *34*, 80–96.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597.

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. London: SAGE Publications.

Brede, J., Remington, A., Kenny, L., Warren, K., & Pellicano, E. (2017). Excluded from school: Autistic students' experiences of school exclusion and subsequent re-integration into school. *Autism & Developmental Language Impairments*, *2*, 239694151773751.

Cappadocia, M. C., Weiss, J. A., & Pepler, D. (2012). Bullying experiences among children and youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *42*(2), 266–277.

Charman, T., Pickles, A., Simonoff, E., Chandler, S., Loucas, T., & Baird, G. (2011). IQ in children with autism spectrum disorders: Data from the Special Needs and Autism Project (SNAP). *Psychological Medicine*, *41*(3), 619–627.

Coates, J. K., & Pimlott-Wilson, H. (2019). Learning while playing: Children's Forest School experiences in the UK. *British Educational Research Journal*, *45*(1), 21–40.
Constantino, T. E. (2008). Constructivism. In L. Given (Ed.), *The sage encyclopedia of qualitative research* (Thousand Oaks: SAGE Publications) (pp. 116–120).
Dabaja, Z. F. (2021). The Forest School impact on children: Reviewing two decades of research. *Education 3-13*, 1–14.
de Kleijn, R., & Van Leeuwen, A. (2018). Reflections and review on the audit procedure: Guidelines for more transparency. *International Journal of Qualitative Methods*, *17*(1), 1609406918763321.
Egan, D. (2020). *An exploration of psychological wellbeing in Irish Forest Schools* (Doctoral dissertation). https://dspace.mic.ul.ie/handle/10395/2913
Einfeld, S. L., Beaumont, R., Clark, T., Clarke, K. S., Costley, D., Gray, K. M., … Howlin, P. (2018). School-based social skills training for young people with autism spectrum disorders. *Journal of Intellectual & Developmental Disability*, *43*(1), 29–39.
Flick, U. (2014). *The SAGE handbook of qualitative data analysis*. London: SAGE Publishing.
Friedman, S., Imrie, S., Fink, E., Gedikoglu, M., & Hughes, C. (2021). Understanding changes to children's connection to nature during the COVID-19 pandemic and implications for child well-being. *People and Nature*, *4*(1), 155–165.
Friedman, S., & Morrison, S. (2021). 'I just want to stay out there all day': A case study of two special educators and five autistic children learning outside at school. *Frontiers in Education*, *6*, 668991.
Goldfarb, Y., Golan, O., & Gal, E. (2021). A Self-Determination theory approach to work motivation of autistic adults: A qualitative exploratory study. *Journal of Autism and Developmental Disorders*. doi:10.1007/s10803-021-05185-4
Goodall, C. (2018). 'I felt closed in and like I couldn't breathe': A qualitative study exploring the mainstream educational experiences of autistic young people. *Autism & Developmental Language Impairments*, *3*, 239694151880440.
Harris, F. (2017). The nature of learning at forest school: Practitioners' perspectives. *Education 3-13*, *45*(2), 272–291.
Institute for Outdoor Learning. (2021, March 22). *Outdoor learning Covid-19 impact survey IV: Outdoor learning within education*. https://www.outdoor-learning.org/Portals/0/IOL%20Documents/Covid-19/COVID-19%20IMPACT%20SURVEY%20IV%20-%20%20OL%20WITHIN%20EDUCATION%20REPORT%20Final.pdf?ver=2021-03-25-204226-367
Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, *2*, 217–250.
Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge: Cambridge University Press.
Khan, M., McGeown, S., & Bell, S. (2020). Can an outdoor learning environment improve children's academic attainment? A quasi-experimental mixed methods study in Bangladesh. *Environment and Behavior*, *52*(10), 1079–1104.
Kingsbury, C. G., Sibert, E. C., Killingback, Z., & Atchison, C. L. (2020). "Nothing about us without us:" The perspectives of autistic geoscientists on inclusive instructional practices in geoscience education. *Journal of Geoscience Education*, *68*(4), 302–310.
Knight, S. (2011). *Forest School for all*. London: SAGE.
Lai, M.-C., Kassee, C., Besney, R., Bonato, S., Hull, L., Mandy, W., … Ameis, S. H. (2019). Prevalence of co-occurring mental health diagnoses in the autism population: A systematic review and meta-analysis. *The Lancet Psychiatry*, *6*(10), 819–829.
Largo-Wight, E., Guardino, C., Wludyka, P. S., Hall, K. W., Wight, J. T., & Merten, J. W. (2018). Nature contact at school: The impact of an outdoor classroom on children's well-being. *International Journal of Environmental Health Research*, *28*(6), 653–666.
Maas, J., Verheij, R. A., de Vries, S., Spreeuwenberg, P., Schellevis, F. G., & Groenewegen, P. P. (2009). Morbidity is related to a green living environment. *Journal of Epidemiology and Community Health*, *63*(12), 967–973.
MacQuarrie, S., Nugent, C., & Warden, C. (2015). Learning with nature and learning from others: Nature as setting and resource for early childhood education. *Journal of Adventure Education and Outdoor Learning*, *15*(1), 1–23.
Maddox, B. B., Crabbe, S., Beidas, R. S., Brookman-Frazee, L., Cannuscio, C. C., Miller, J. S., … Mandell, D. S. (2020). "I wouldn't know where to start": Perspectives from clinicians, agency leaders, and autistic adults on improving community mental health services for autistic adults. *Autism*, *24*(4), 919–930.
McCormick, R. (2017). Does access to green space impact the mental well-being of children: A systematic review. *Journal of Pediatric Nursing*, *37*, 3–7.
McCree, M., Cutting, R., & Sherwin, D. (2018). The Hare and the Tortoise go to Forest School: Taking the scenic route to academic attainment via emotional wellbeing outdoors. *Early Child Development and Care*, *188*(7), 980–996.
Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
Mitchelson, H., Adams, D., & Simpson, K. (2022). Factors and experiences that influence school mobility for autistic students: A systematic review. *British Journal of Educational Psychology, Early View*. doi:10.1111/bjep.12505
Morrier, M. J., & Ziegler, S. (2018). I wanna play too: Factors related to changes in social behavior for children with and without autism spectrum disorder after implementation of a structured outdoor play curriculum. *Journal of Autism and Developmental Disorders*, *48*(7), 2530–2541.
Nuttall, A. (2016). The 'curriculum challenge': Moving towards the 'Storyline' approach in a case study urban primary school. *Improving Schools*, *19*(2), 154–166.
O'Brien, L. (2009). Learning outdoors: The Forest School approach. *Education 3-13*, *37*(1), 45–60.

O'Brien, L., & Murray, R. (2007). Forest School and its impacts on young children: Case studies in Britain. *Urban Forestry & Urban Greening*, *6*(4), 249–265.

Pellicano, L., Bölte, S., & Stahmer, A. (2018). The current illusion of educational inclusion. *Autism*, *22*(4), 386–387.

Petrigna, L., Thomas, E., Scardina, A., Rizzo, F., Brusa, J., Camarazza, G., … Bellafiore, M. (2022). Methodological considerations for movement education interventions in natural environments for primary school children: A scoping review. *International Journal of Environmental Research and Public Health*, *19*(3), 1505.

Richardson, E. A., Pearce, J., Shortt, N. K., & Mitchell, R. (2017). The role of public and private natural space in children's social, emotional and behavioural development in Scotland: A longitudinal study. *Environmental Research*, *158*, 729–736.

Roe, J., & Aspinall, P. (2011). The restorative outcomes of forest school and conventional school in young people with good and poor behaviour. *Urban Forestry & Urban Greening*, *10*(3), 205–212.

Ryan, R. M., & Deci, E. L. (2000). Self-Determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *11*, 68–78.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. New York: Guildford Publications.

Sher, D. A., & Gibson, J. L. (2021). Pioneering, prodigious and perspicacious: Grunya Efimovna Sukhareva's life and contribution to conceptualising autism and schizophrenia. *European Child & Adolescent Psychiatry*. doi:10.1007/s00787-021-01875-7

Skinner, E. A., Chi, U., & The Learning-Gardens Educational Assessment Group 1. (2012). Intrinsic motivation and engagement as "active ingredients" in garden-based education: Examining models and measures derived from self-determination theory. *The Journal of Environmental Education*, *43*(1), 16–36.

Stutchbury, K. (2021). Critical realism: An explanatory framework for small-scale qualitative studies or an 'unhelpful edifice'? *International Journal of Research & Method in Education*. doi:10.1080/1743727X.2021.1966623

Tiplady, L. S. E., & Menter, H. (2020). Forest School for wellbeing: An environment in which young people can 'take what they need.' *Journal of Adventure Education and Outdoor Learning*, 1–16.

Tracy, S. J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research. *Qualitative Inquiry*, *16* (10), 837–851. doi:10.1177/1077800410383121

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, *11*(3), 201–230.

Vasa, R. A., Hagopian, L., & Kalb, L. G. (2020). Investigating mental health crisis in youth with autism spectrum disorder. *Autism Research: Official Journal of the International Society for Autism Research*, *13*(1), 112–121.

Waite, S. (2011). Teaching and learning outside the classroom: Personal values, alternative pedagogies and standards. *Education 3-13*, *39*(1), 65–82.

Wang, C. K. J., Ang, R. P., Teo-Koh, S. M., & Kahlid, A. (2007). Motivational predictors of young adolescents' participation in an outdoor adventure course: A self-determination theory approach. *Journal of Adventure Education and Outdoor Learning*, *4*(1), 57–65.

Yıldırım, G., & Akamca, G. Ö. (2017). The effect of outdoor learning activities on the development of preschool children. *South African Journal of Education*, *37*(2), Article 2.

Zachor, D. A., Vardi, S., Baron-eitan, S., Brodai-meir, I., Ginossar, N., & Ben-Itzchak, E. (2017). The effectiveness of an outdoor adventure programme for young children with autism spectrum disorder: A controlled study. *Developmental Medicine & Child Neurology*, *59*(5), 550–556. doi:10.1111/dmcn.13337

Zachor, D. A., Vardi, S., Baron-Eitan, S., Brodai-Meir, I., Ginossar, N., & Ben-Itzchak, E. (2017). The effectiveness of an outdoor adventure programme for young children with autism spectrum disorder: A controlled study. *Developmental Medicine and Child Neurology*, *59*(5), 550–556.