An exploration of psychological wellbeing in Irish Forest Schools

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Abstract

Background: Forest School is a form of regular and repeated outdoor learning. Children may access Forest School across a range of different settings, including primary school. There is evidence emerging in the literature that Forest School has a positive impact on aspects of wellbeing including confidence, relatedness, problem-solving and happiness. However, the mechanisms underlying the impact of Forest School on wellbeing are less clear.

Aims: The objective of this study was to explore Self-Determination Theory and Nature Connectedness as potential theoretical frameworks underpinning experiences of wellbeing associated with Forest school. Self-determination theory identifies autonomy, relatedness, and competence as crucial elements of human motivation, with social environments that support these needs supportive of wellbeing. Nature connectedness describes an individual's subjective sense of their relationship with the natural world. The study proposes that being outdoors, a social constructivist pedagogy, and opportunities to take risks will lead to heightened perceptions of autonomy, competence, relatedness, and connection to nature.

Sample: Purposive sampling was used to select two Irish primary schools running Forest School sessions. Using an explanatory 'two case' case study, Forest School practice was examined in these settings. Case 1 included a group of 2nd class students, two Forest School leaders, a class teacher, a special education teacher, and two parents. Case 2 included a group of 6th class students, a Forest School leader, a class teacher, and two parents.

Methods: Before data collection, a set of theoretical propositions were drawn up based on self-determination theory and nature connectedness. Qualitative data exploring the propositions were collected via observations and interviews with children, leaders, teachers, and parents. Quantitative data were obtained through the administration of two scales; the Connection to Nature Index and an adapted version of the Basic Psychological Need Satisfaction Scale.

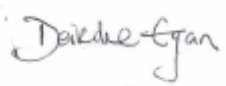
Results: Thematic analysis and pattern-matching were employed to analyse the interview data. Qualitative data were triangulated with quantitative data relevant to each proposition. The analyses identified, from the perspectives of different stakeholders, the extent to which Forest School practice reflected the theoretical propositions. Findings highlighted an array of experiences of perceived autonomy, competence, relatedness, and nature connectedness. In addition, findings revealed barriers to these experiences for some participants.

Conclusions: The findings serve to extend the limited empirical literature on wellbeing in Forest School and address a dearth of theoretical frameworks underpinning Forest School. Implications for the provision of Forest School are discussed in the context of research, policy, and practice.

Declaration

I hereby declare that this thesis is the result of my own original research and does not contain the work of any other individual, save those identified and acknowledged in the usual way.

Name: Deirdre Egan

Signed: 

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List of Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
ASD	Autism Spectrum Disorder
BPNS	Basic Psychological Need Satisfaction Scale
CAMHS	Child and Adolescent Mental Health Service
CNI	Connection to Nature Index
CSO	Central Statistics Office
CSPE	Civic Social and Political Education
CYP	Children and Young People
DES	Department of Education and Skills
DCYA	Department of Children and Youth Affairs
DOH	Department of Health
EP	Educational Psychologist
ERIC	Education Resources Information Centre
FS	Forest School
FSA	Forest School Association
FSL	Forest School Leader
HPS	Health Promoting School
HSE	Health Service Executive
IFSA	Irish Forest School Association
LCQ	Learning Climate Questionnaire
MIREC	Mary Immaculate Research Ethics Committee
NC	Nature Connectedness
NCSE	National Council for Special Education
NEPS	National Educational Psychological Service
NHS	National Health Service (UK)
PE	Physical Education
PSI	Psychological Society of Ireland
RTI	Response to Intervention
RQ	Research Question
SDT	Self-Determination Theory
SDQ	Strengths and Difficulties Questionnaire
SET	Special Education Teacher

SPHE	Social Personal and Health Education
SPSS	Statistical Package for the Social Sciences
TA	Teaching Assistant
TA	Thematic Analysis
TEP	Trainee Educational Psychologist
UK	United Kingdom
UN	United Nations
WHO	World Health Organisation
WoE	Weight of Evidence

1. Introduction

1.1 Overview

Wellbeing and contact with nature are two aspects of health and educational research that have developed prominence in recent years. There is increasing interest in the potential benefits of time spent in nature for mental health and wellbeing. This is reflected in the Irish context (Department of Children and Youth Affairs [DCYA], 2014). Of note, the Department of Education and Skills published a 'Wellbeing Policy Statement and Framework for Practice' (Department of Education and Skills [DES], 2019b) last year. The central aim is the promotion of the mental and physical wellbeing of all children in our schools. Forest School (FS), the focus of the current study, is a form of regular outdoor learning. Primary school is one setting where children can access FS. There is evidence emerging in the literature that FS has a positive impact on wellbeing. However, to an extent, it is an area where practice has preceded theory. The exploration of wellbeing from a theoretical perspective, therefore, is the basis for the current study.

This chapter introduces key elements that set the context for the current study. Firstly, a reflexivity statement is outlined. Secondly, an overview of the mental health and wellbeing context for children and young people (CYP) in Ireland is provided. Thereafter, a whole-school approach to wellbeing is outlined. This is followed by a description of FS and an overview of the current study.

1.2 Reflexivity Statement

As a trainee educational and child psychologist (TEP), I have had the opportunity to work with children and young people in disability, mental health, and school psychology services. In line with national and international statistics, an increasing number of CYP are presenting to all services with mental health difficulties. As well as working directly with these CYP, I am interested in what we can do as professionals and as a society to prevent these difficulties occurring or reoccurring. From my background as a primary school teacher, I am aware that some universal wellbeing promotion interventions are focused on learning about wellbeing. Many of the children I worked with were already struggling with 'workbook' style tasks. While psychoeducation has an important role to play, I was particularly interested in preventative approaches that might translate the concept of wellbeing into opportunities

for children to be well. FS was one approach that proposed to offer opportunities for children to experience wellbeing by spending time outdoors.

I am also interested in how educational psychologists (EPs) can collaborate with schools to conduct research. During my training I observed that assessment, consultation, and intervention were more prominent aspects of casework when compared with research. With the introduction of doctoral training programmes, EPs are increasingly well positioned to conduct research within schools. The emphasis is on a scientist practitioner model, combining research with practice. Furthermore, EPs are in a position to evaluate practices that schools report are working from a somewhat objective perspective. As FS has a limited research base, it was an opportunity to collaborate with Irish schools to evaluate this novel educational practice.

1.3 Mental Health and Wellbeing Context

Positive mental health and wellbeing are acknowledged as essential for CYP in living a fulfilled life (DES, DCYA, Department of Health [DOH], Health Service Executive [HSE], & National Educational Psychological Service [NEPS], 2015). However, the National Council for Special Education (NCSE) estimated than in 2006 86,083 children attending Irish schools had a moderate or severe mental health difficulty (NCSE, 2006). As the 2016 census reported that 2.6% of the overall population had a psychological or emotional condition, a 28.7% increase on 2011 (Central Statistics Office [CSO], 2016), it is hypothesised that the number of CYP with mental health difficulties will also have increased. In parallel to these demographic changes, the importance of positive mental health and wellbeing for CYP has increasingly come to the fore of national and educational policy (DCYA, 2014; DES, 2019b).

1.4 Whole School Approach

Although the home and family are the main sources of nurture and support for children, the school has a significant role to play in wellbeing promotion (DES et al., 2015). Consequently, there exists a need for "evidence-based, whole-school approaches to well-being that cultivate safer, more effective learning environments" (C. Bradley et al., 2018, p. 245). This involves a shift from a deficit-based model of mental health, with interventions targeted at discrete groups or topics (e.g. anti-bullying, social skills), to a more preventative approach so that wellbeing promotion becomes embedded in school culture and is sustained over time (A. M. Clarke & Barry, 2010; Svane, Evans, &

Carter, 2019). The DES circulars 0042/2018 and 0043/2018 emphasise that teachers are particularly well placed to promote wellbeing across the whole school and to identify, at an early stage, CYP who may benefit from early intervention (DES, 2018a; DES, 2018b).

National health and educational policies espouse a health promoting school (HPS) approach as one way of conceptualising wellbeing promotion, outlined in Figure 1.1. In the 'Wellbeing in Primary Schools: Guidelines for Mental Health Promotion' document (DES et al., 2015), a HPS approach is defined as "a way of thinking and working that is adopted by all in the school to make it the best possible place to learn, work and play" (p.15). A HPS emphasises the connections between school policy, curriculum, physical and social environment, and relationships with the wider school community.

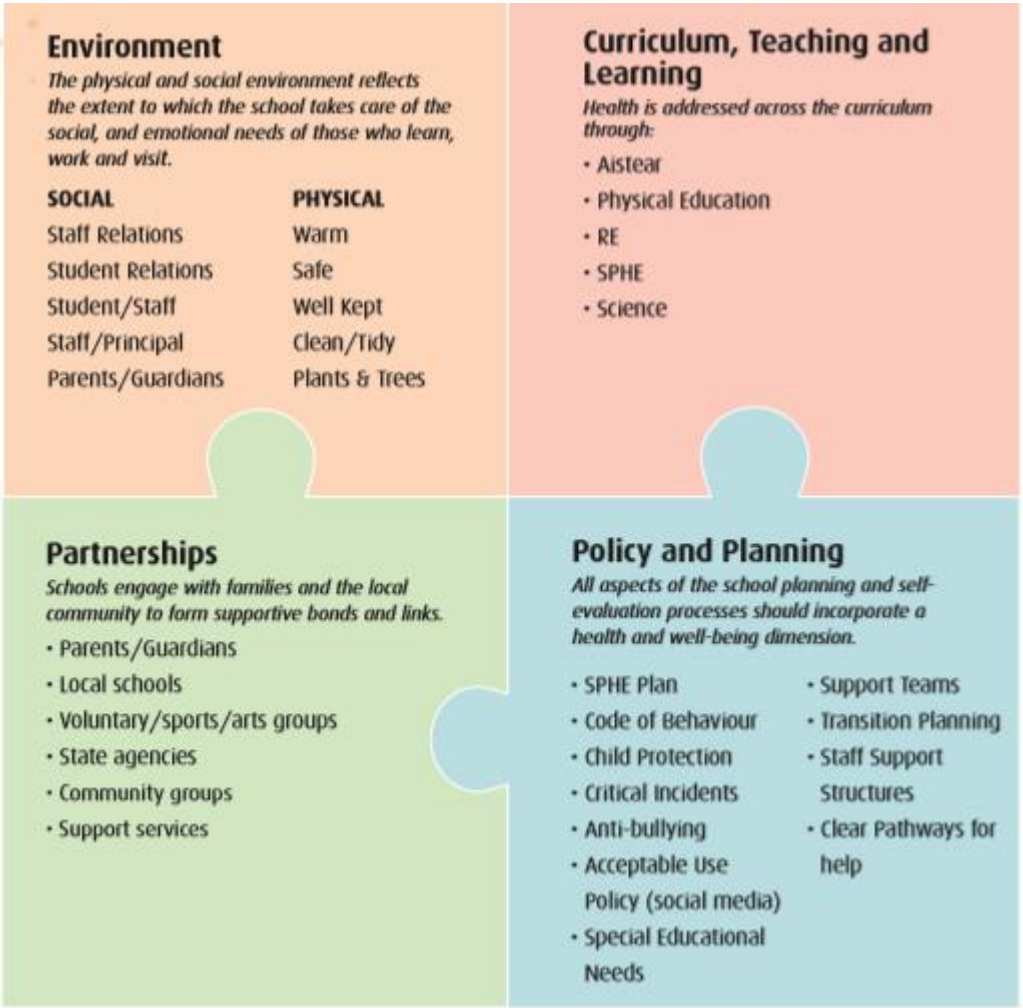

Figure 1.1. The Health Promoting School. This figure shows the four key areas of action (DES, DOH, HSE, DCYA & NEPS, 2015).

One of the aims of a HPS is to "provide a framework for developing health promoting initiatives in a way that supports and enhances the implementation of the curriculum" (DES et al., 2015, p. 15). Forest School is an example of an initiative used in a small number of Irish primary schools that has the potential to encompass all four dimensions of a HPS.

1.5 Forest School

Forest School is a distinct model of outdoor education. One definition of FS is a process that "offers children, young people and adults regular opportunities to achieve, develop confidence and self-esteem through hands-on learning experiences in a local woodland environment" (L. O'Brien, 2009, p. 45). Forest School sessions are often delivered in partnership with trained FS leaders or practitioners, in woodland space on or close to the school grounds (Harris, 2018). Although curriculum delivery is not an explicit aim of FS, it has been demonstrated to have close links to curricular objectives (Harwood & Collier, 2017; Murphy, 2018; Trapasso et al., 2018). Despite wellbeing promotion featuring amongst the aims of FS, there exists a dearth of empirical literature on wellbeing in FS. In light of such matters, the need for robust and reliable data related to wellbeing in FS was recognised. Furthermore, FS has been criticised as an under-theorised educational practice (Leather, 2018). In particular, the author sought to approach this study from a theoretical perspective.

1.6 The Current Study

This research study aimed to explore the experiences of participants engaged in FS across two school contexts. It sought to construct an understanding of their experiences from the perspective of Self-Determination Theory (Deci & Ryan, 1985; R. M. Ryan & Deci, 2000) and Nature Connectedness (Cheng & Monroe, 2012; Mayer & Frantz, 2004). According to self-determination theory, three basic needs of autonomy, competence, and relatedness must be nurtured to experience motivation and personal growth. The extent to which environments foster the satisfaction of these needs is a key predictor of wellbeing (Deci & Ryan, 2000). Nature connectedness can be defined as ''individuals' experiential sense of oneness with the natural world'' (Mayer & Frantz, 2004, p. 504).

Wellbeing was conceptualised from a systems-based perspective, with an individual's wellbeing influenced by factors including relationships and their environment. Data were collected from the multiple perspectives of children, Forest

School leaders, teachers, and parents using observations, scales, and two forms of semi-structured interviews. The qualitative data were analysed using pattern matching and thematic analysis. The quantitative data were analysed using descriptive statistics and correlations of the questionnaire subscales. The findings are presented to elucidate each of the three research questions in the results section of this thesis. Thereafter, specific implications for research, policy and practice are discussed. From a theoretical perspective, this study extends current knowledge and understanding of specific ways in which FS practice may facilitate experiences of wellbeing. The findings also have implications for how FS may be delivered to enhance student wellbeing, including training staff to support the delivery of FS within schools. Figure 1.2 provides a visual map to the structure of the thesis.

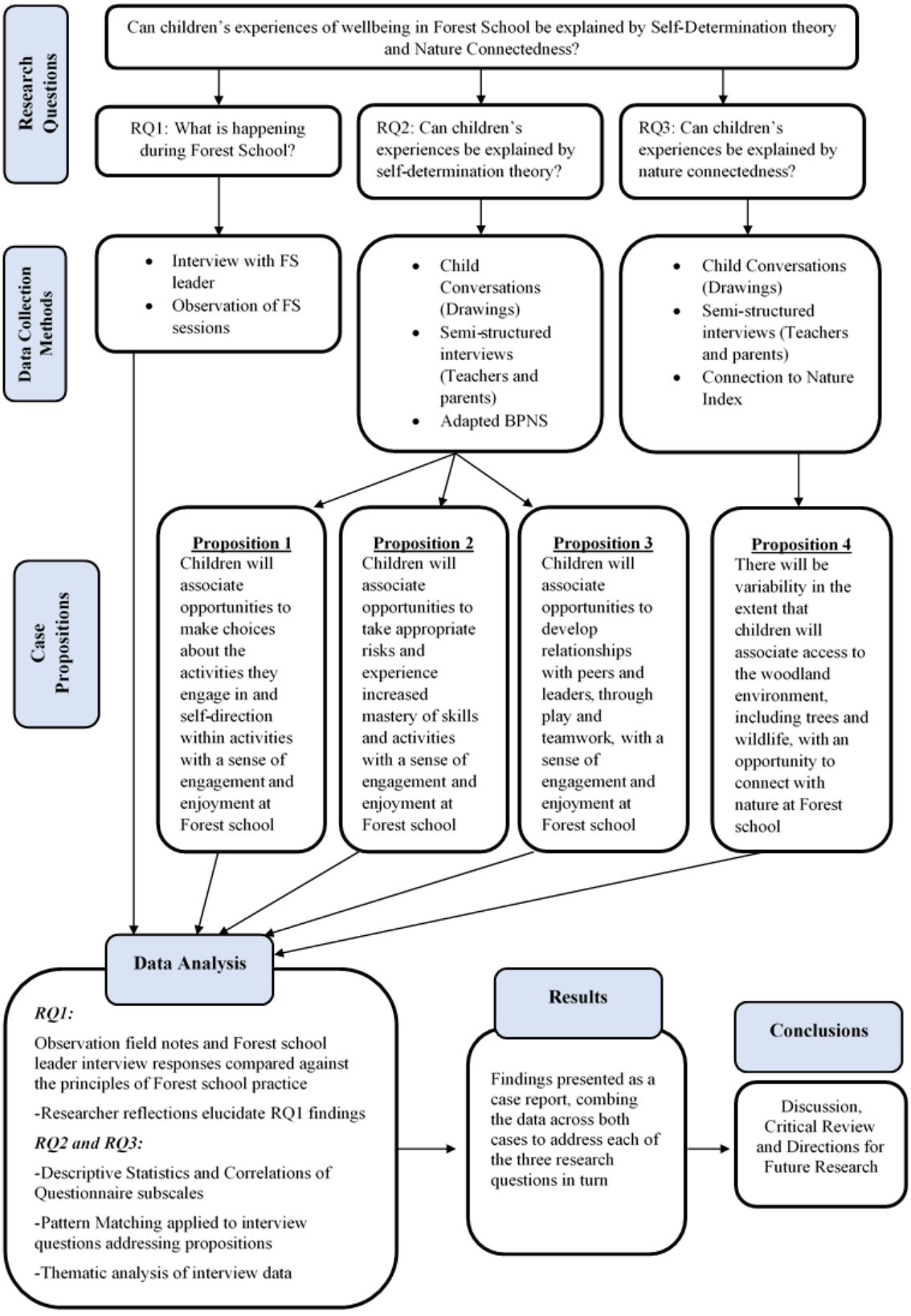

Figure 1.2. Overview of thesis structure.

2. Review Paper

2.1 Overview

In this chapter, FS will be examined in greater depth, and research relevant to wellbeing in FS will be critically evaluated. The chapter will begin by situating FS in the broader context of nature-based education and play. The next sections will discuss FS in terms of its history, defining principles, pedagogy, and finally a synopsis of criticisms as they relate to the rationale for the current study. An overview of national and educational policy and educational curricula relevant to wellbeing promotion will be outlined. Thereafter, self-determination theory and nature connectedness will be delineated as potential theoretical frameworks underlying experiences of wellbeing in FS.

The available literature exploring the association between self-determination theory (SDT), nature connectedness (NC) and FS will be systematically reviewed. The findings from this review will be synthesised in relation to the research topic. The chapter will conclude with an overview of the aims and research questions as they pertain to the current research project.

2.2 Nature and Play

Play is a term that loosely describes activities and behaviours in which children engage (Pellegrini, 2009; Ridgers, Knowles, & Sayers, 2012). It is seen as “freely chosen, personally directed, intrinsically motivated behaviour that actively engages the child” (National Children's Office, 2004, p. 11). Much of the body of research on nature and education includes elements of play. Play and the outdoors naturally complement each other. Throughout history children across most cultures have played outdoors, with other children (P. Gray, 2011). The outdoor environment offers many of the elements that exemplify best practice in rich play environments, including variety, challenge, opportunities for movement, natural materials, and stimulation of the five senses (National Children's Office, 2004).

While children will play anywhere with almost anything, the environment in which they play influences the type of play in which they engage (R. A. Wilson, 2008). Research on children’s play in outdoor kindergartens suggests the presence of more creative, diverse, and imaginative play compared to indoor settings (Bilton, 2010; Fjortoft, 2001). The outdoor spaces most linked with innovative child-led play are not just outside but are unstructured (Staempfli, 2009). Compared to playgrounds, with

equipment bolted in place and designed for use in a particular way, the diversity of natural environments affords children more significant opportunities to make a playspace their own (R. A. Wilson, 2008). In a small scale study exploring adults' childhood memories of outdoor experiences, details of the outdoor context, the social aspects of the experience, active investigation and the risk and challenge of adventure were the most common aspects recalled (Waite, 2007). Regular opportunities for free and unstructured play outdoors has been associated with adaptability, social skills, health, and happiness in children (Burdette & Whitaker, 2012; Waite, Rogers, & Evans, 2013).

Elements of natural environments test children's competencies in terms of their perception of risk and challenge and the development of motor skills. Outdoor play can provide risky formative experiences (Connolly & Haughton, 2017). Risky play is play that offers a thrilling and exciting emotional experience for the child and often exposes them to something that may have previously invoked fear, been prevented, or avoided (Harper, 2017; Sandseter, 2009). Examples of risky play may include play involving significant height or speed, play with dangerous tools or near harmful elements, and rough and tumble play (Sandseter, 2007, 2009). From an evolutionary perspective, Sandseter and Kennair (2011) suggest that risky play affords children opportunities to push themselves to the limits of their capabilities and experience the positive feedback that comes through mastery. Ample opportunities to take risks in relative safety, experiencing positive affect and autonomous coping, may allow children to overcome anxieties and increase a sense of wellbeing (Sandseter & Kennair, 2011).

2.3 Nature and Education

Although the importance of learning outdoors has long held a place in educational research, there has recently been a renewed interest in the impact of contact with nature on children's development and wellbeing. Kindergarten, as a Froebelian concept, was a 'garden for children' designed so that children could act out and play in the real world (Chung & Walsh, 2000). Froebel believed in connectedness between all living things and emphasised the importance of children being in contact with nature (Tovey, 2007). Rousseau promoted returning to nature and letting children into the woods (Ulset, Vitaro, Brendgen, Bekkhus, & Borge, 2017) while Dewey advocated for an experiential approach to education, immersing students into the local environment (Louv, 2008).

An increased emphasis on test-based accountability in schools in recent decades has led to experiential outdoor education becoming an often neglected aspect of the school curriculum (James & Williams, 2017). Coupled with growing up in an increasingly risk-averse society, children are spending less time than ever outdoors (Moss, 2012; Savery et al., 2017). Increased litigation, an increase in structured and timetabled after-school activities, and time pressure are further obstacles to direct exposure to nature (Holloway & Pimlott-Wilson, 2014; Louv, 2008). Concerns about this dissociation from nature led to the development of the term 'nature deficit disorder', not a medical or psychological condition but rather a disorder of society as children stop going out into the natural world to play (Louv, 2008).

Despite this trend, widespread agreement remains that playing and learning in natural environments is pivotal in fostering children's development (R. A. Wilson, 2008). The school environment has been found to play an important role in social, emotional, and behavioural wellbeing (Gutman & Feinstein, 2008). There is evidence that access to natural landscapes for play and learning is associated with increased positive mood and reduced stress, anger, inattention, and problem behaviour (Chawla, Keena, Pevec, & Stanley, 2014; Mårtensson et al., 2009; Roe & Aspinall, 2011). The symptoms of Attention Deficit Hyperactivity Disorder (ADHD) have been shown to reduce through exposure to green spaces (Faber Taylor & Kuo, 2009, 2011). A report published by Plymouth University entitled 'Student Outcomes and Natural Schooling: Pathways from Evidence to Impact' brought together evidence from five previous reviews focusing on impacts on "physical health and wellbeing" and "character capabilities" including "application, self-regulation, empathy, creativity and innovation, and their capacity to be successful learners" (Waite & Malone, 2016, p. 4).

2.4 Forest School

2.4.1 History of Forest School.

The concept of FS primarily originated in Scandinavia (K. Bradley & Male, 2017; Murphy, 2018). It became an element of the Danish early years curriculum in the 1980s as a way of integrating the expansion of early years settings into woodlands with the development of practical and academic skills (Swarbrick, Eastwood, & Tutton, 2004). In the twenty years since a group of practitioners from Bridgewater College developed the concept in the UK following a visit to Denmark (Slade, Lowery, & Bland, 2013), FS has become increasingly popular across the UK and, more recently, in

Ireland. Forest School is closely linked to the Learning Outside the Classroom Manifesto in the UK, encouraging schools to provide quality outdoor education (Connolly & Haughton, 2017). Although people of all ages can access FS, children are the focus of this study.

2.4.2 Principles of Forest School.

Forest Schools are not buildings or institutions but outdoor spaces, regularly visited, that propose to offer children the opportunity to take risks and direct their learning (Knight, 2009). According to the UK and Irish FS Associations, the goal of FS is to "encourage and inspire individuals of any age through positive outdoor experiences" (FSA, n.d.; IFSA, n.d.). However, FS asserts to involve more than time outdoors. It is a learner-centred pedagogical approach based on distinct principles (Mackinder, 2017; Murphy, 2018).

There are six core principles of Forest School:

(1) Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visits; A cycle of planning, observation, adaptation, and review links each session.

(2) Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world.

(3) Forest School uses a range of learner-centred processes to create a community for being, development, and learning.

(4) Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent, and creative learners.

(5) Forest School offers learners the opportunity to take supported risks appropriate to the environment and themselves.

(6) Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. (FSA, n.d., IFSA, n.d.)

2.4.3 Pedagogical concepts underpinning Forest School practice.

Learning in FS may be said to involve a constructivist (L. O'Brien, 2009) or social constructivist approach (Knight, 2018). Constructivism, in its broadest sense, views "learning as an active process of constructing knowledge to make sense of the world" (P. Adams, 2006, p. 245). Social constructivism posits that the construction of knowledge is the product of social interaction (Vygotsky, 1962). In social constructivism, anyone who interacts directly with a learner under learning conditions can be considered part of their social world. According to the FS Associations' guiding principles, FS focuses on children's interaction with the physical and social world (FSA, n.d., IFSA, n.d.). The process reflects experiential learning, emphasising learner-oriented approaches over task-oriented approaches (Harris, 2018). Forest School leaders should play an active role in the learning process. Rather than the traditional format of instruction followed by testing, the premise is that children learn when they make mistakes and problem solve (Harris, 2017).

In line with social-constructivism, play is a central element in FS practice. Free play and risky play are both evident in the literature (Button & Wilde, 2019; Coates & Pimlott-Wilson, 2019; Connolly & Haughton, 2017; Ridgers et al., 2012). The natural woodland setting provides an unstructured environment, full of loose parts, conducive to creative child-led play (Ridgers et al., 2012). However, the forest can be an unfamiliar environment and independent exploration must be carefully nurtured (Swarbrick et al., 2004). The establishment of a base camp as a secure base and forms of hiding and seeking games are often used to gradually build trust and create a sense of safe separation from adults (Swarbrick et al., 2004). Although freedom is encouraged, there remains space for the more knowledgeable other in the children's experiences. Forest School leaders are in a position to support the social or skill-based aspects of the learning (Harris, 2017).

Forest School can allow children to actively take risks in nature (Connolly & Haughton, 2017). Many of these risks occur through play-based activities, including tree climbing and den building, as well as skill development such as fire lighting and tool use (Coates & Pimlott-Wilson, 2019). Leaders' knowledge of the environment helps to distinguish risks from hazards, allowing children to develop the skills needed to manage risk (Ridgers et al., 2012; Taylor, 2019). This is exemplified in research with preschool staff who reported feeling more confident and relaxed about risk when they

saw how capable the children were of working within boundaries following a five-week engagement with FS (Button & Wilde, 2019).

2.4.4 Forest School and the Primary Curriculum

Forest School is typically separate from the school curriculum, although studies have pointed to opportunities to incorporate physical education (Trapasso et al., 2018), science (Hayward, 2018), and literacy (Harwood & Collier, 2017). Specific to the Irish context, FS practice has been demonstrated to support the delivery of the construction strand of the Primary Visual Art curriculum (Murphy, 2018). Research in Australia and the UK has explored the potential of FS in supporting children to acquire a sense of place (Cumming & Nash, 2015; Harris, 2018), a core concept in the Primary Geography curriculum (NCCA, 1999b). The breath of curricular areas that may be addressed by FS reflects the integrated approach to learning advocated by the Primary Curriculum (NCCA, 1999c). Furthermore, opportunities for environment-based learning increase "the relevance and effectiveness of children's learning" (NCCA, 1999c, p.15). Research argues that FS provides opportunities to deliver elements of the curriculum in an experiential and active way (Swarbrick et al. 2004; O'Brien 2009; Coates and Pimlott-Wilson 2019). Aistear, the early childhood curriculum for children in preschool and early primary school, emphasises play as a pedagogical approach in curriculum delivery (NCCA, 2009). The centrality of play in FS practice has been evidenced in research (Coates & Pimlott-Wilson, 2019: Ridgers, 2012). There is an increasing emphasis in the literature on the need to systematically examine the impact of FS in educational settings, including research in the Irish context (Murphy, 2020).

2.4.5 Criticisms of Forest School.

Forest School, as an approach to outdoor education, is not without its criticisms. Concerns have been raised about the translation of FS from Scandinavia to the UK (Leather, 2018). As many practising FS leaders in Ireland trained in the UK, this is relevant to the local context. Forest School is influenced by ideas from the Scandinavian philosophy of friluftsliv. This philosophy is based on freedom in nature and spiritual connectedness with the landscape (Gelter, 2000). While outdoor education is an integral part of Scandinavian cultural identity, it is not as much of a cultural norm in the UK (Maynard & Waters, 2007) or Ireland. Although the principles may have remained the same in taking FS from Scandinavia to the UK, elements of practice have been adapted to fit within the social norms. This raises the question if FS can offer similar benefits in

cultures including Ireland, where children's typical developmental experiences are not of the outdoors.

The centrality of play in FS is promoted as one of the unique contributions of this form of outdoor education. Yet the concept of learning through playing, particularly free play, is not without contention (Leather, 2018). Free play, sometimes referred to as unstructured play, is primarily play that is directed entirely by children themselves rather than by adults (P. Gray, 2011). However, FS is regularly provided within the structure of educational settings in the presence of trained adults. Both a freely-chosen participant-led approach to play and the role of the more experienced other is emphasised in FS material (Knight, 2018). While this aligns with social constructivist pedagogy, it is somewhat removed from free play in its purest form (P. King & Howard, 2016).

It is notable that the current discourse on FS is largely emerging from proponents of FS, including research conducted by FS leaders (Hayward, 2018; Murphy, 2018), with FS leaders (Harris, 2017, 2018; Maynard, 2007b) and through funding obtained from forestry initiatives (L. O'Brien & Murray, 2007). Although established leaders may offer a "wealth of experience" (Harris, 2017, p. 273), possible conflicts of interest open the field to claims of potential bias in terms of reporting the impact of FS. Waite, Bølling and Bentsen, for example, contend that studies evaluating FS programmes often serve to reaffirm anticipated benefits without a conceptual framework or rationale to elucidate the findings (2016). Other limitations in FS research include small sample sizes (Davis & Waite, 2005), the accessibility of scale measures to young children (Harris, 2017) and unpublished reports that lack the rigour of a peer-review process (Maynard, 2007b; Waite, Bølling, & Bentsen, 2016).

Forest School is situated across a variety of sectors including "outdoor learning, connecting children to nature, child-led learning and personal, social and emotional development of children" (Harris, 2018, p. 225). Despite this, there is a paucity of discipline specific literature, with much of the exploratory research identifying broad-ranging outcomes (Leather, 2018). Sara Knight, an early years teacher, FS leader, and academic in the field (Knight, 2009, 2011, 2012, 2013) has drawn together existing theorisations behind FS (see Figure 2.1). However, there is a scarcity of empirical evidence to demonstrate the transfer of theory to practice. Although studies have highlighted psychological benefits associated with FS (Waite et al., 2016), the majority

of the espoused benefits are anecdotal and have not been researched from a psychology perspective. In light of such matters, the need for empirical research related to psychological wellbeing in FS was recognised.

The following sections of this literature review aim to explore wellbeing as a broad psychological construct and to examine the position of wellbeing policy in the Irish educational context.

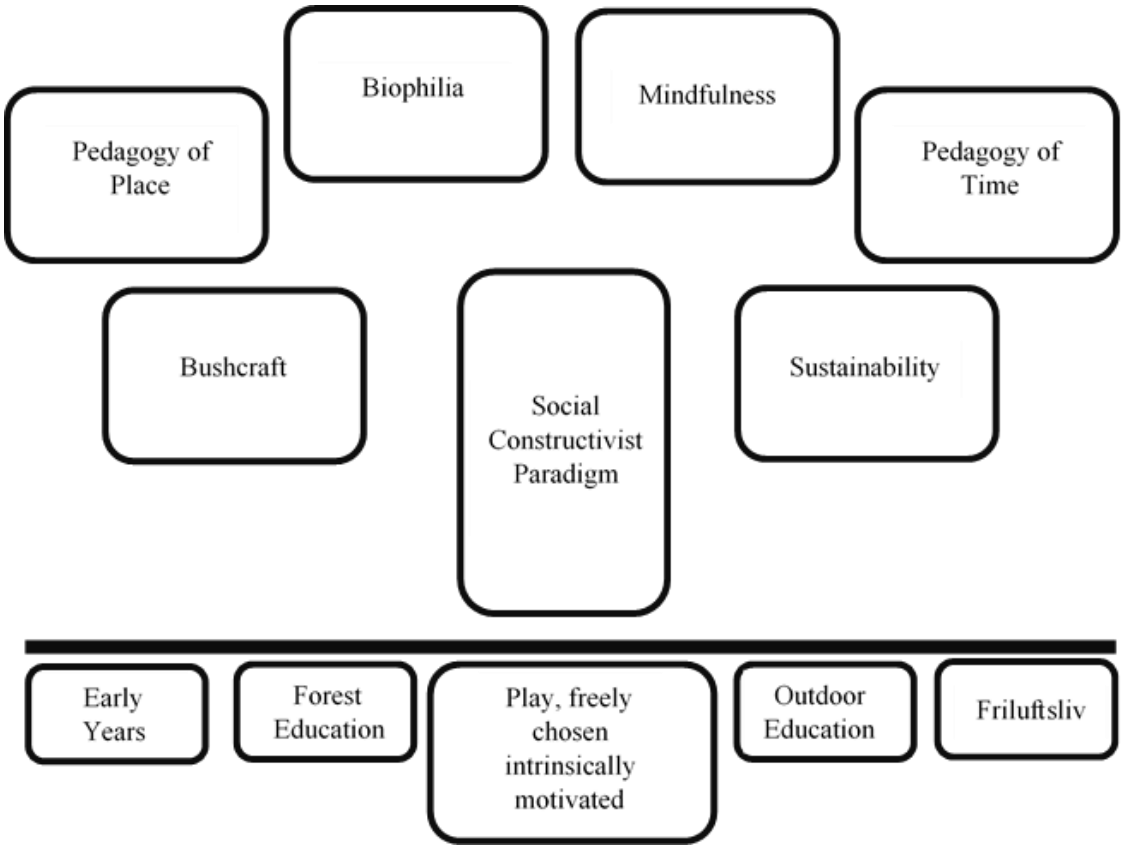

Figure 2.1. An overview of existing theorisations in Forest School pedagogy (Knight, 2018).

2.5 Wellbeing

Wellbeing is a complex construct that concerns "optimal psychological functioning and experience" (R. M. Ryan & Deci, 2001, p. 142). Historically viewed as synonymous with the mere absence of mental illness, two major perspectives emerged in an effort to define wellbeing as a separate construct (Tennant et al., 2007). These perspectives are described as hedonic wellbeing, concerned with subjective experiences of happiness, the attainment of pleasure and avoidance of pain and eudaimonic wellbeing, concerned with psychological functioning and achieving one's potential (Diener & Lucas, 1999; Ryff & Keyes, 1995). Hedonic wellbeing is often referred to as

subjective wellbeing, comprising life satisfaction, the presence of positive mood, and the absence of negative mood (R. M. Ryan & Deci, 2001). Psychological wellbeing is more closely associated with the eudaimonic perspective, encompassing autonomy, personal growth, self-acceptance, life-purpose, mastery, and positive relatedness (Ryff & Keyes, 1995).

Over time acceptance has grown within positive psychology that general psychological wellbeing may be best represented by a combination of the two perspectives. This is supported by research that shows positive correlations between indicators of hedonic and eudaimonic wellbeing, inferring that they are not mutually exclusive (Huta & Ryan, 2010; L. A. King, Hicks, Krull, & Gaiso, 2006) and that the highest levels of overall wellbeing are related to a combination of hedonic and eudaimonic motives (Capaldi, Dopko, & Zelenski, 2014; Huta & Ryan, 2010). A framework for mental wellbeing proposed by R. M. Ryan and Deci (2001) is grounded in both perspectives, accounting for both feeling and functioning. Positive mental health is increasingly used interchangeably with psychological wellbeing to connote overall wellbeing (Liddle & Carter, 2015).

Due to the history of mental health being viewed as the absence of mental illness, the development of scales to measure wellbeing was limited (Rose et al., 2017). Measures of mental illness often reach a ceiling score when used to account for average to positive mental health. More recently, with the growth of positive psychology, there is a focus on wellbeing as a positive measure of healthy functioning (McDowell, 2010; Seligman & Csikszentmihalyi, 2000). As this positive conceptualisation of wellbeing has developed prominence across scientific, policy, and commercial domains, increased attention has been given to how it can be operationalised and measured (J. Ryan et al., 2019). This is of particular relevance to children, where the purpose of these scales is often to evaluate programmes and interventions designed to promote wellbeing.

2.5.1 Irish policy context.

Wellbeing has come to the fore across national policy and practice in recent years. ‘Better Outcomes Brighter Futures 2014-2020’ is a national policy document relating to children and young people (DCYA, 2014). One of the five desired outcomes is that all children “are active and healthy, with positive physical and mental wellbeing” (DCYA, 2014, p. xiv). This sentiment is mirrored for the broader population in ‘Healthy Ireland’ (DOH, 2013), the government's framework for health and wellbeing. With

wellbeing identified as a key focus in the National Action Plan for Education (DES, 2019a), the Department of Education and Skills in Ireland recently published a 'Wellbeing Policy Statement and Framework for Practice' (DES, 2019b). This document focuses on the role schools are to play in wellbeing promotion. Outlined in the vision statement is that by 2023 "all schools and centres for education will provide evidence-informed approaches and support, appropriate to need, to promote the wellbeing of all their children and young people" (DES, 2019b, p. 5).

Part of the role of the National Educational Psychological Service (NEPS) is to support the implementation of the wellbeing framework in primary and post-primary schools. NEPS model of service is described as a Continuum of Support (NEPS, 2007a), outlined in Figure 2.2.

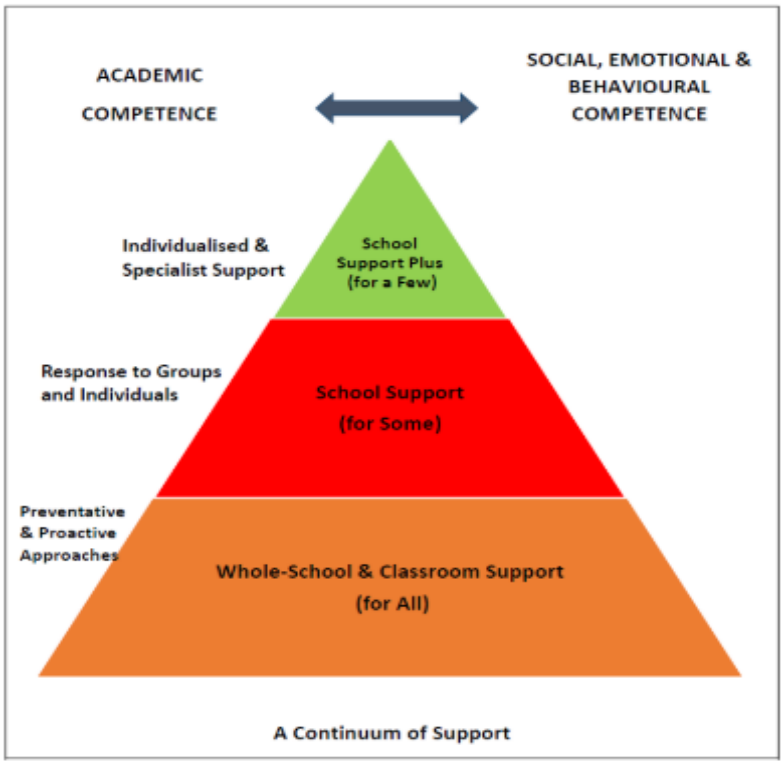

Figure 2.2. The Continuum of Support (NEPS, 2007a; SESS, n.d.).

The three-tiered model offers a flexible framework within which schools can address all educational needs, including wellbeing needs. It reflects the widely used three-tier Response to Intervention (RTI) model (Bender & Shores, 2007). At a basic level, it focuses on whole-school support for wellbeing promotion that includes prevention and development of social and emotional competence and coping skills for all children. At a whole-school level universal approaches to wellbeing, such as the development of an environment that fosters positive educational experiences, are

emphasised (Tynan & Nohilly, 2018). Wellbeing is addressed across the early years, primary and post-primary curricula (NCCA, 1999, 2009, 2011, 2017). It is one of the four themes of Aistear, the Early Childhood Curriculum Framework (NCCA, 2009) and is embedded in Social Personal Health Education (SPHE), Physical Education (PE), and Civic Social and Political Education (CSPE). At Junior Cycle, a 300-hour wellbeing programme was introduced in 2017, to have increased to 400 hours by this year. Each school's programme is unique but typically includes guidance-related learning and short courses focused on wellbeing alongside the subject areas outlined previously (NCCA, 2017). The continuum of support acknowledges that there will also be a need for targeted prevention or intervention in a minority of cases, at tier two and three. As is the case with universal interventions, targeted approaches should have a sound theoretical base and rationale, specific goals, and a direct and explicit focus on outcomes (Weare & Nind, 2011).

2.5.2 Wellbeing and Forest School.

Based on information from the Irish Forest School Association website (IFSA, n.d.), FS is offered by a number of primary schools, although no exact figures are available. The Heritage in Schools scheme (Heritage Council, n.d.) includes FS sessions among the collaborative projects they offer to schools and are currently funding research to explore FS sessions in the Irish primary school curriculum. Against this backdrop of increased accessibility to FS within our education system, it is timely that research also examines the espoused psychological benefits of FS. Two theoretical frameworks that may contribute to our understanding of wellbeing in this context will now be examined. The first, self-determination theory, is a broad theory of human motivation which appears to have close links to FS (Barrable & Arvanitis, 2019). The second, nature connectedness, relates to the impact of the natural environment on wellbeing and is grounded in biophilia.

2.6 Self-Determination theory

Self-determination theory is a theory of human motivation. It emerged in the literature in the mid-1980s (Deci & Ryan, 1985) and has been expanded upon and refined in the decades since (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 2008a, 2008b; Deci, Ryan, & Guay, 2013; R. M. Ryan & Deci, 2000). Self-determination theory differs from other theories of motivation as it details different

types of motivation as opposed to the overall amount of motivation a person has for a behaviour (see Figure 2.3).

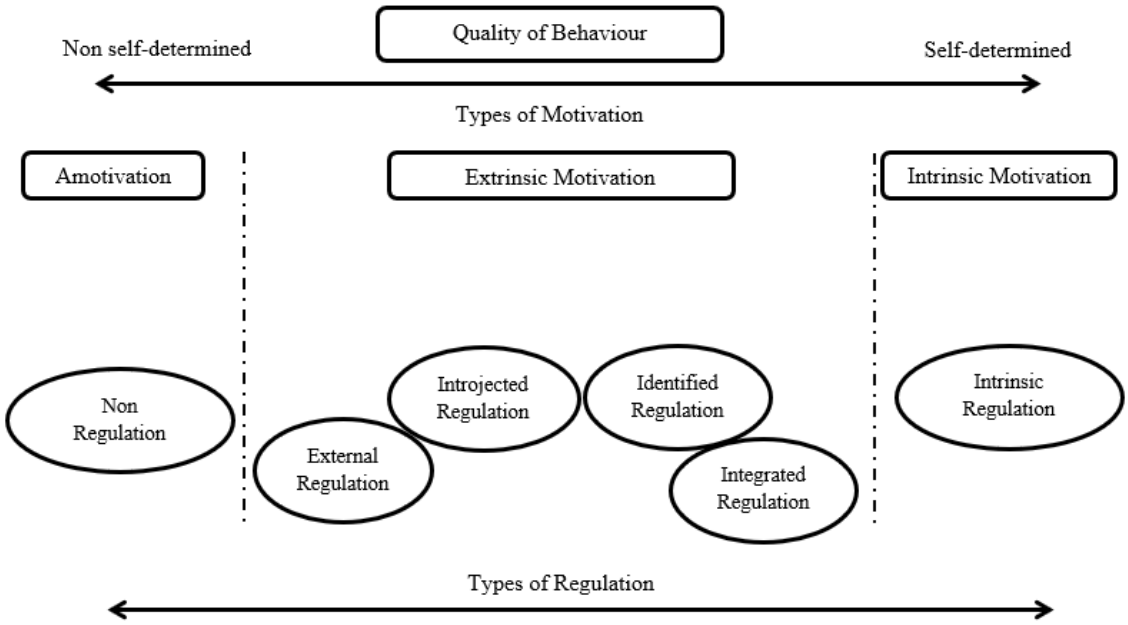

Figure 2.3. Self-Determination Continuum. Adapted from R.M. Ryan and Deci (2000, p.72).

SDT differentiates between amotivation, extrinsic motivation, and intrinsic motivation. Amotivation, or lack of motivation, is at one end of the continuum. Intrinsic motivation, the most autonomous form of motivation, is at the opposite end of the continuum. Behaviours that a person engages in when they are free to choose are intrinsically motivated (R. M. Ryan & Deci, 2000). Four types of extrinsic motivation are placed between amotivation and intrinsic motivation, based on the extent to which they are controlled versus autonomous. External regulation is the most controlled form of extrinsic motivation. It occurs when a person is motivated by external contingencies, including rewards and punishments. The person's behaviour is regulated by external agents. Introjected regulation is energised by internal factors such as seeking approval or avoiding shame (Deci & Ryan, 2008b). Although the regulation has moved within the person the motivation is still controlled. Identified and integrated regulation refer to extrinsic motivation in situations where a person identifies with the values of a particular activity, reducing internal conflict. These are more autonomous forms of extrinsic motivation. The presence of autonomous motivation is linked to experiences of wellbeing (R. M. Ryan & Deci, 2000).

The motivated behaviours outlined on the SDT continuum can broadly be divided into two categories; self-determined behaviours and non self-determined, or controlled, behaviours (Deci, Vallerand, Pelletier, & Ryan, 1991). Research has demonstrated that the interaction between the social context and inherent regulatory processes influence whether behaviours are perceived as self-determined or controlled (R. M. Ryan & Deci, 2000). Many behaviours that humans engage in, including work or study, are not intrinsically motivating of their own accord. However, the social context in which they are performed can influence the degree to which these behaviours are integrated and thus become self-determined (Deci et al., 1991). Contextual supports including the provision of a meaningful rationale, acknowledgement of feelings, and convention of choice rather than control can make a social context more supportive of self-determined regulation (Deci et al., 1994, p. 124). Under experimental conditions, a minimum of two of these contextual factors was shown to be sufficient to promote integration (Deci et al., 1994). This is likened to the concept of a threshold, whereby a social context must be generally supportive of self-determination for autonomous motivation to occur.

SDT can be described as a macro theory of motivation. It comprises six sub-theories, outlined in Figure 2.4. Each sub-theory addresses different motivational phenomena.

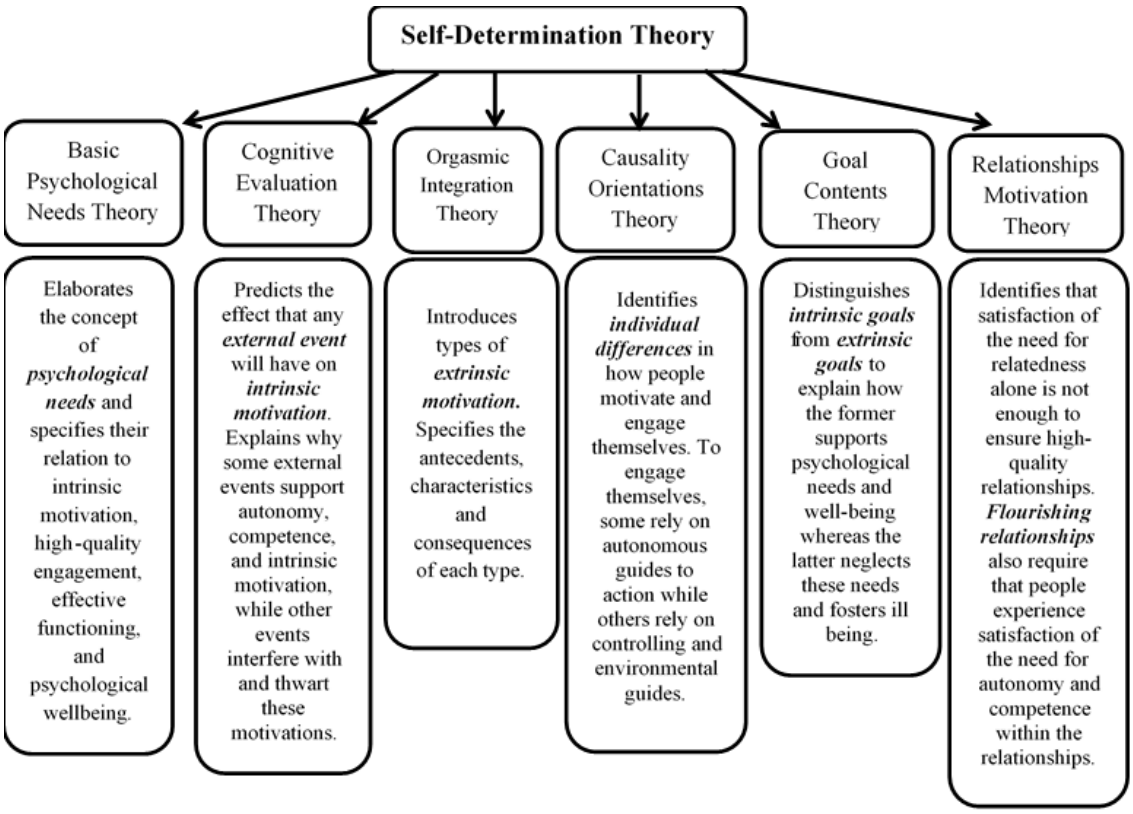

Figure 2.4. Six mini-theories of Self-Determination Theory (adapted from Deci & Ryan, 2014; Reeve, 2012).

Basic Psychological Needs Theory is one of six micro-theories that make up SDT. It is the dimension of SDT primarily focused on in this study. It identifies three psychological needs, namely autonomy, competence, and relatedness, as crucial elements of autonomous motivation (Deci & Ryan, 2000). These three psychological needs are likened to physiological needs, required for physical development and functioning, and defined as "innate psychological nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p. 229).

Autonomy is defined as "being self-initiating and self-regulating of one's own actions", competence as "understanding how to attain various external and internal outcomes and being efficacious in performing requisite actions" and relatedness as "developing secure and satisfying relationships with others in one's social milieu" (Deci et al., 1991, p. 327). Research conducted across different countries and cultures has supported the hypothesis that these are universal psychological needs (Deci & Ryan, 2008b). Although they may be expressed differently by different people across cultures, individuals universally will not thrive without satisfying all three needs to some extent (Deci & Ryan, 2000). This combined need for autonomy, competence, and relatedness

is labelled psychological need satisfaction or basic need satisfaction (R. M. Ryan & Deci, 2000). Social environments that facilitate psychological need satisfaction increase autonomous motivation and enhance social and emotional wellbeing (Deci et al., 1991; R. M. Ryan & Deci, 2000). Conversely, when these needs are not satisfied effective functioning and psychological wellbeing is diminished.

The application of SDT to education contexts is widely researched. In an education setting, children can experience autonomy if behaviour is volitional, competence if tasks are attainable, and relatedness through connecting and interacting with others (Niemiec & Ryan, 2009). Autonomy-supportive teachers focus on facilitation rather than control (Deci & Ryan, 2008a). Students who learn in classrooms with autonomy-supportive teachers are shown to be more intrinsically motivated, have higher self-esteem, and feel better about themselves (Chirkov & Ryan, 2001; Reeve, 2006, 2009). In school settings where children feel secure and cared for by adults, they have been shown to internalise extrinsic regulations (R. M. Ryan, Stiller, & Lynch, 1994).

2.6.1 Self-Determination theory and Forest School.

The connection between a SDT framework and FS was advanced in a recently published article (Barrable & Arvanitis, 2019). This conceptual paper outlines theoretical links between autonomy, competence, and relatedness and FS. The paper is based on ideal FS practice, as described in the literature, as opposed to empirical research. The paper concludes that empirical research investigating SDT in real FS practice is required, concurrent with the aims of this study.

2.7 Nature and Wellbeing

2.7.1 Biophilia.

There is a growing body of research on the connection between wellbeing and the natural environment (Bratman et al., 2019; Stevens, 2010). E.O. Wilson (1984) proposed the biophilia hypothesis, suggesting that humans have an innate need to affiliate with and feel connected to the natural world. The theory posits that biophilic instinct is biological: an inborn predisposition to affiliate with, or to attend to, natural or natural-like elements and processes (Kellert & Wilson, 1995). Although there is limited empirical research to support the biophilia hypothesis as an inherent need, it underpins a diverse body of research into the connection between nature and wellbeing. From an eco-psychological perspective, Roszak, Gomes and Kanner (1995) suggest that people have a need to belong in the natural world similar to the need to belong in the social world. When people are in nature and meet this need to belong they will experience psychological benefits (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009). A review of ecotherapy research showed that exposure to the natural world decreased negative behaviours and states, including depression and anxiety, and increased positive ones, including self-esteem (Chalquist, 2009).

A corpus of research underpinned by the biophilia hypothesis has sought different explanations for the beneficial effects of nature on wellbeing, with some researchers suggesting it may have positive effects on attention (Berman, Jonides, & Kaplan, 2008; Kaplan & Kaplan, 1989; Stevenson, Dewhurst, Schilhab, & Bentsen, 2019) and stress (Ulrich, 1983; Ulrich et al., 1991). Natural elements, including the volume of vegetation present, were associated with how children perceive the restorativeness of school playgrounds (Bagot, Allen, & Toukhsati, 2015). Long-term exposure to residential areas rich in green space was associated with a reduction in inattentiveness in children aged between four and seven (Dadvand et al., 2017) while

nearby nature was associated with fewer attention problems even when children reported a preference for urban landscapes (Meidenbauer et al., 2019). Nature-based experiences have been associated with a reduction of physiological symptoms of stress, including sympathetic nervous activity, and psychological symptoms of stress, including negative mood states, in adults (Berto, 2014) and children (Shao, Elsadek, & Liu, 2020).

2.7.2 Nature connectedness.

Nature connectedness relates to an individual's subjective sense of their relationship with the natural world (Mayer & Frantz, 2004). While the biophilia hypothesis posits that human beings' need to affiliate with nature is innate, connectedness to nature acknowledges that "there is considerable variability in the extent to which individuals are drawn to and feel connected to nature" (Nisbet, Zelenski, & Murphy, 2011, p. 304). Connectedness to nature may mediate the relationship between exposure to nature and wellbeing (Mayer et al., 2009). Individuals higher in nature connectedness tend to have more pro-environmental attitudes and engage in more pro-environmental behaviour (Gosling & Williams, 2010; Mayer & Frantz, 2004; Nisbet, Zelenski, & Murphy, 2009). They also seem to be more conscientious, extraverted, agreeable, and open (Nisbet et al., 2009; Tam, 2013) and score higher on aspects of psychological wellbeing including positive affect, autonomy, personal growth, and purpose in life (Nisbet et al., 2011). Recent meta-analyses in this area have shown that people who feel more connected to nature rate higher on self-report measures of both hedonic and eudaimonic wellbeing (Capaldi et al., 2014; Pritchard, Richardson, Sheffield, & McEwan, 2019).

2.7.3 Nature connectedness and children.

The corpus of research exploring the link between NC and wellbeing in children is less comprehensive than in adults. In a recent study, the 'Connectedness to Nature scale' (Mayer & Frantz, 2004) was adapted for use by parents of preschool children to measure their children's connection to nature. Outcomes were then tested against the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), a validated measure of children's psychological functioning and problem behaviours. The study found children that enjoyed nature more displayed lower overall distress and impairment, children who demonstrated greater responsibility toward nature were less hyperactive, had fewer behavioural and peer difficulties, and improved prosocial behaviour, while

children who were more aware of nature exhibited less emotional difficulties (Sobko, Jia, & Brown, 2018).

Research on connection to nature among children has demonstrated that not all children feel strong emotional bonds with nature. A study of children aged between four and eleven did not reflect the preference for nature typically reported by adults (Meidenbauer et al., 2019). However, the children's preference for natural over urban environments increased with age. These findings appear to contradict the hypothesis that the biophilic instinct is biologically inherent from childhood. However, it enhances the suggestion that the biophilic instinct may be shaped by learning in and experiencing the natural world. As FS is mostly attended by preschool and primary school-aged children, it may provide access to nature at a critical stage.

Research has suggested that biophilia may be influenced by the presence or absence of positive experiences in nature at particular stages in a child's development (Orr, 1993). Children who spend more time in nature report a stronger connection to nature (Cheng & Monroe, 2012) while adults who recall spending more time in nature during their childhood have stronger nature connectedness (Tam, 2013). This suggests that individual differences in NC may have valuable contributions to make in our understanding of the biophilia hypothesis and relationship between humans and nature (Capaldi et al., 2014).

2.7.4 Nature connectedness and Forest School.

One of the core principles of FS, as outlined earlier in this chapter, is that it takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world (IFSA, n.d.). In terms of NC, this principle is twofold. The first part addresses the physical space, giving children a direct experience in nature. Wooded areas are conducive to outdoor learning as trees provide shelter, limbs to climb on, branches for den building and fire lighting, loose parts to play with, and a wilder, less confined space than, perhaps, a field or garden (Coe, 2017). The importance of the physical landscape on children's experiences extends to their play and sense of freedom (Harris, 2017, 2018; Ridgers et al., 2012).

The second part of this principle accounts for the development of a relationship with nature. Forest School should be a long-term process of regular sessions. This is important as NC is seen to increase over time if individuals visit nature frequently (Richardson, Cormack, McRobert, & Underhill, 2016). Pathways to NC have been

examined in research with an adult population. Activities that encompassed contact with nature, emotion, meaning, compassion, and beauty were shown as pathways to NC while knowledge-based activities were not (Lumber, Richardson, & Sheffield, 2017). If pathways to NC are similar for children and adults, FS pedagogy could have the potential to foster a relationship with nature.

Limited studies have explicitly focused on NC in FS. A thesis study exploring FS and wellbeing showed the early environmental experiences and greater NC were associated with higher levels of wellbeing and that FS increased nature connectedness for males, despite reporting lower overall nature connectedness than females (Roberts, 2017). A recent examination of published evidence demonstrated six key themes indicative of a positive relationship with nature (Smith, Dunhill, & Scott, 2018). These include increased knowledge about the local environment, understanding of the outdoor environment, and improved relationship with the outdoors. Nature connectedness has been linked with increased environmental concern and pro-environmental behaviour (Nisbet et al., 2009). A study on environmental attitudes and FS showed that children who engaged in FS demonstrated a more pro-environmental attitude (Turtle, Convery, & Convery, 2015). However, the study did not measure nature connectedness or control for other variables. Despite the promising evidence in the studies highlighted above, there is a paucity of research examining NC and FS. This is a gap in the literature that is worthy of further study.

2.8 Towards a Theoretical Framework for Wellbeing in Forest School

The broad aim of the current study is to explore how FS promotes wellbeing in children. The previous sections of this chapter have provided an overview of how SDT, NC and FS pedagogy may align. These sections have drawn on theoretical and empirical research across a broad range of FS contexts. The next section of this chapter is a systematic review of peer-reviewed FS literature. The empirical research in this section focuses on experiences of FS for children in pre-school or primary school.

At the time of writing, a review of the online databases British Education Index, ERIC, Education Source, Education Full Text, PsycInfo, and PsycArticles indicated that no empirical studies investigating SDT in FS were published to date. There were limited studies focused on aspects of NC. Therefore, this review aims to explore if experiences of autonomy, competence, relatedness (Deci & Ryan, 1985), and nature connectedness (Cheng & Monroe, 2012) feature in other empirical FS research. To capture a broader

range of studies, additional indicators of subjective and psychological wellbeing (Kammann & Flett, 1983; Tennant et al., 2007) are included. These include confidence, usefulness, interest in life, problem-solving, thinking clearly and creatively, energy, happiness, and optimism (Liddle & Carter, 2015).

2.9 Systematic Literature Review Strategy

A comprehensive literature search was conducted in August 2019 and updated in March 2020. Six relevant databases were searched: British Education Index, ERIC, Education Source, Education Full Text, PsycInfo, and PsycArticles. Table 2.1 shows the search terms used to identify articles relevant to the review question. A multi-field search was conducted using the commands 'OR' and 'AND' to combine search terms. Only peer-reviewed articles were selected for screening.

Table 2.1.

Search terms used to identify appropriate studies

#	Search Term	Results
1	"Forest School*" AND (wellbeing or well being or well-being)	34
2	"Forest School*" AND (biophili* or nature)	67
3	"Forest School*" AND (learn* or experienc*)	292
4	"Forest School*" AND (autonomy or competence or relatedness)	23
5	"Forest School*" AND connect*	58
6	"Forest School*" AND motivation	28

* indicates a truncated item, e.g., school* will search for schools or schooling

The review process was divided into three steps: title screening, abstract screening, and document screening. A visual map of the process is included in Figure 2.5. Title screening involved reviewing the outputs from each database search and downloading all titles that appeared relevant to a citation manager (Endnote Online). Of the 502 titles screened, 39 articles were downloaded for further review. Abstracts of all 39 were then screened, and 11 articles were retained, which appeared to meet inclusion criteria (see Table 2.2). The full text of all 11 retained articles was critically assessed using the same inclusion/exclusion criteria as the abstract screening, leaving six papers to be included in the systematic review. Finally, reference lists of all six papers were inspected for additional relevant citations. One study was included in this process, making a total of seven. The list of studies excluded after abstract screening with rationale can be found in Appendix A.

Table 2.2.

Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion	Rationale
1. Type of publication	Peer-reviewed journal	Not a peer-reviewed journal	The study has a level of methodological rigour from a process of external moderation.
2. Language	The study is written in English	The study is not written in English	As translators were unavailable papers needed to be published in English to be read, understood, and appraised.
3. Setting	The study focuses on practices in a Forest School run by a qualified Forest School leader/practitioner	The study does not focus on practices in a Forest School, or a qualified Forest School leader/practitioner does not run it	The review is explicitly addressing the impact of Forest School as outlined by the Irish Forest School Association
4. Intervention	Access to Forest School is on a regular basis – evidence of multiple sessions	Access to Forest School is once-off or not on a regular basis	Regular access is one of the key principles of Forest School
5. Participants	Participants must be children aged between 3 and 12 and/or children attending a pre-school or primary school OR their	Any participant who is not aged 3 and 12 and/or children attending a pre-school or primary school	The review question seeks to review the effects of Forest School on children

	parents/teachers/FS leaders		
6. Outcome variables	The outcome variables include descriptors or perspectives on Forest School experience	The outcome variables do not include descriptors or perspectives on Forest School experience	The review question seeks to establish children, parent, or practitioner's perspectives on Forest School
7. Outcome variables	The outcomes include an aspect of wellbeing The following is a comprehensive, though not exhaustive, list of outcomes that may be included: confidence, usefulness, interest in life, problem-solving, autonomy, positive relationships, competence, thinking clearly and creatively, energy, happiness, and optimism (Deci & Ryan, 1985; Tennant et al., 2007)	The outcomes do not include an aspect of wellbeing	The review question is specifically related to children's wellbeing
8. Outcome variables	The outcomes include some aspect of a connection to nature evidenced by the enjoyment of nature, empathy for creatures, a sense of oneness	The outcomes do not include some aspect of a connection to nature	The review question is specifically related to children's connection to nature

	with nature or a sense of responsibility towards nature (Cheng & Monroe, 2012)	

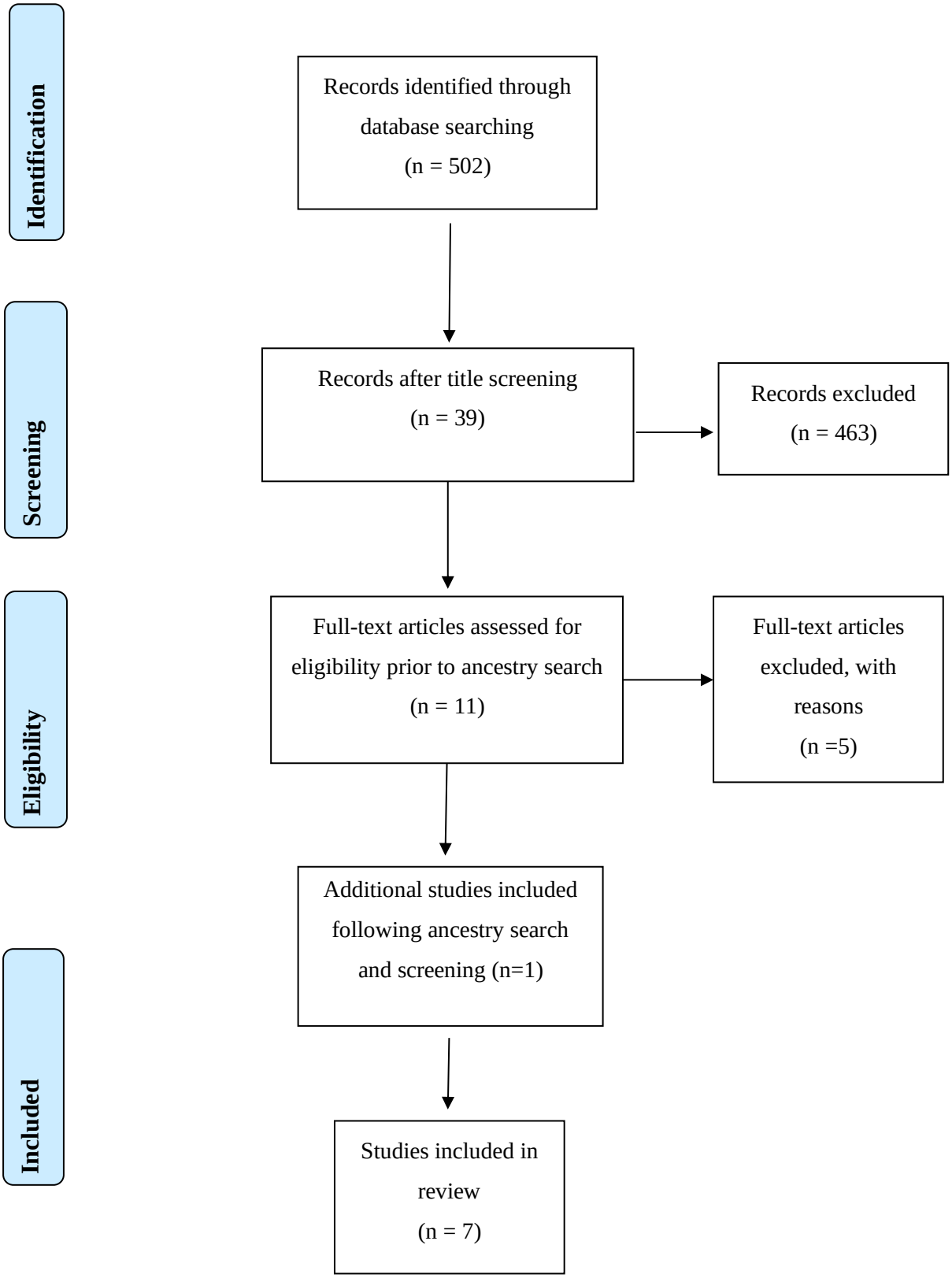

Figure 2.5. Process of Search Strategy.

2.9.1 Overview of included studies.

Key characteristics of the seven studies included in this review are presented in Appendix B. Gough's (2007) Weight of Evidence (WoE) framework was used to critically appraise the selected studies. The framework comprises three judgements to examine the quality and relevance of each study.

Studies are rated for methodological quality (WoE A), methodological relevance to the review question (WoE B), and relevance of the evidence to the review question (WoE C), resulting in an overall weight of evidence (WoE D). The appraisal of methodological relevance (WoE B) was informed by 'Credibility and Quality Measures for Qualitative Research in Special Education' (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005). Summary weightings of the seven reviewed studies are included in Table 2.3. A detailed explanation of the WoE criteria and ratings used on each of the seven studies is included in Appendix C.

Table 2.3.

Summary of Weight of Evidence

Study	WoE A Methodological Quality	WoE B Methodological Relevance	WoE C Relevance of Evidence to the Review	WoE D Overall Weight of Evidence
K. Bradley and Male (2017)	3	3	2.3	2.8 (High)
L. O'Brien and Murray (2007)	2.7	3	2.7	2.8 (High)
L. O'Brien (2009)	2.7	3	2	2.6 (High)
Maynard (2007)	2	2.3	2.7	2.3 (Medium)
Harris (2017)	2.3	2	2.7	2.3 (Medium)
Coates and Pimlott-Wilson (2019)	2.7	2.7	2.3	2.6 (High)
Harris (2018)	2.3	2	2.7	2.3 (Medium)

The review will now explore the key outcomes of the studies appraised and discuss implications and directions for the current research.

2.9.2 Participants.

Participants in the studies were children attending FS, their parents, teachers, and FS practitioners. Three of the studies (K. Bradley & Male, 2017; L. O'Brien, 2009;

L. O'Brien & Murray, 2007) included children, parents, teachers, and FS practitioners. The perspectives of four children with a diagnosis of Autism (ASD), their mothers, and two teaching assistants (TAs) were sought by K. Bradley and Male (2017). The same sample was used in the study by L. O'Brien (2009) as L. O'Brien and Murray (2007); it comprised 24 children across seven schools observed over eight months. Informal interviews were conducted with nine parents and a staff member from one of the schools. Forest School practitioners formed the sample for three studies (Harris, 2017, 2018; Maynard, 2007b). The final study (Coates & Pimlott-Wilson, 2019) included 33 children across two primary schools.

All the studies took place in England and Wales. The children participating in the studies attended preschool (L. O'Brien & Murray, 2007), mainstream primary school (Coates & Pimlott-Wilson, 2019; L. O'Brien, 2009; L. O'Brien & Murray, 2007) and special school (K. Bradley & Male, 2017). The children ranged in age from three years to nine years. The experiences of FS differed somewhat between studies, although all children attended multiple sessions with evidence of the involvement of a Level 3 trained practitioner. Three studies demonstrated extensive access to FS with children in attendance for between 45 and 75 hours across an academic year (K. Bradley & Male, 2017; L. O'Brien, 2009; L. O'Brien & Murray, 2007). Another study reported children attending six half-day or six full-day sessions (Coates & Pimlott-Wilson, 2019). Where practitioners' perspectives were sought, they worked in FS across rural, urban and early years settings (Harris, 2017; Maynard, 2007b).

2.9.3 Design.

All of the research papers included in this review are based on qualitative data. As the research base into FS from an education or psychology perspective is limited, many of the studies are exploratory. The quality of the methods used was appraised using indicators for studies in the field of education (Brantlinger et al., 2005). These included transparency, accuracy, and method-specific qualities. All of the studies were rated as medium (Harris, 2017, 2018; Maynard, 2007b) or high (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; L. O'Brien, 2009; L. O'Brien & Murray, 2007) for methodological quality.

The studies that received the highest weighting for transparency provided evidence that adequate time was spent in the field to claim dependable results. Before engaging in interviews, K. Bradley and Male (2017) recorded footage of the children in

their study during FS over four weeks. This footage was edited and used as a prompt for the children during their interviews. Two weeks after the interviews, the children were once again presented with the questions and this time allowed to respond through an alternative method: drawing. The first author, K. Bradley, also used a research diary to reflect on interviews based on the proposition by Kvale (2007) that this additional time can support the analysis of the transcripts.

In the studies by L. O'Brien and Murray (2007) and L. O'Brien (2009), a total of 360 observations over eight months were made of the 24 children involved, in addition to interviews and participative workshops to establish frameworks and share experiences. Less detail on the FS sessions in which the children interviewed had engaged was provided by Coates and Pimlott-Wilson (2019), making it more challenging to determine the transferability of their conclusions. In studies focused on practitioner interviews, Harris (2017, 2018) reported the extensive experience of twenty practitioners while Maynard (2007b) stated that the three practitioners she interviewed were all trained but did not detail their experience.

Bias is a crucial element of methodological quality that must be considered in qualitative research studies. A participatory action research approach was utilised by L. O'Brien and Murray (2007) and L. O'Brien (2009). This approach aims to enable stakeholders to be involved in all stages of the research process and can be a very effective research methodology in this domain. Although the studies are transparent in detailing the processes involved L. O'Brien and Murray (2007) state that the approach was designed "to evaluate the positive impact of Forest School" (p. 252) indicating potential bias.

In the study by K. Bradley and Male (2017), the primary researcher was the children's teacher. This may limit the findings by increasing the risk of bias concerning the separation of the scientific and the personal (Seale, 1999). In this case, methodological quality weighting was not impacted as an independent observer was employed to gain a second opinion. Three studies, Harris (2017, 2018) and Maynard (2007b), were based on the perspectives of active FS practitioners. Although FS practitioners have a wealth of experience to offer, it must be considered that they are a self-selecting group and may be more likely to view the topic in a positive light. Harris attempted to account for the risk of inherent bias by asking interviewees if they had any criticisms of FS (2017) and interrogating both positive and negative experiences

(Harris, 2018). Areas of potential bias must be considered in interpreting the findings of the studies.

Although all the studies evidenced some form of triangulation, only one of the studies (K. Bradley & Male, 2017) was ultimately weighted high in terms of accuracy. Four of the studies (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; L. O'Brien, 2009; L. O'Brien & Murray, 2007) demonstrated evidence of collaborative work involving more than one researcher when designing the study or interpreting the findings. K. Bradley and Male's study (2017) was the only paper that also provided evidence of external auditors or peer debriefing, as recommended by Brantlinger (2005). In terms of method-specific quality, all of the studies received a medium or high weighting for interview and observation components and data analysis. Although none of the studies provided a transcript of the interview questions indicators such as "core questions were explored through the use of interrogators (why? how?)" (Harris, 2017, p. 277) and parent's responses (L. O'Brien & Murray, 2007) were used to ascertain suitability.

2.9.4 Methodological relevance.

The review question aimed to establish, through context and the perspectives of stakeholders, how FS may improve wellbeing. Methodological relevance, or Weight of Evidence B (Gough, 2007), focused on the studies providing rich contextual information, perceptual information, and outcomes relating to wellbeing. Studies weighted highly included detail of specific experiences at FS as opposed to outlining the generic principles. They also included multiple stakeholder's perspectives, involving both children and adults. In qualitative research, "rich contextualisation" is important (Roberts-Holmes, 2005, p. 42). Although studies that evaluated wellbeing in FS from a practitioner's perspective met the inclusion criteria, additional weight was given to studies that provided rich evidence of children's experiences. The studies that weighed highly for methodological relevance conducted semi-structured interviews with children (K. Bradley & Male, 2017) or conducted extensive case study research over a lengthy period to obtain rich data on children's experiences and development (L. O'Brien, 2009; L. O'Brien & Murray, 2007).

Three of the studies included an observation component. Observation enables researchers to evaluate actions in practice (Siraj-Blatchford & Wong, 1999). However, there is a risk that events are open to interpretation bias, hence the importance of

triangulating observations with other sources of data (D. E. Gray, 2009). Practitioners in the three studies that utilised a participatory action research approach recorded observations (K. Bradley & Male, 2017; L. O'Brien, 2009; L. O'Brien & Murray, 2007).

2.9.5 Topic relevance.

Three aspects were considered in weighing the relevance of the studies against the review topic in Weight of Evidence C (Gough, 2007). To establish the authenticity of the FS, evidence of the six principles of FS (FSA, n.d.; IFSA, n.d.) was sought. Although none of the studies were based in Ireland, these principles are common to practice in Britain and Ireland. In studies where children were not observed engaging in FS (Harris, 2017, 2018; Maynard, 2007b) evidence of appropriate practitioner training and knowledge was required to merit a high rating.

The search terms were designed to include studies focusing on wellbeing in FS. However, none of the studies accounted for wellbeing a coherent construct. Similarly, 'wellbeing' as a term did not emerge as a theme in any of the studies. Studies that demonstrated elements of SDT (Deci & Ryan, 1985) and NC (Cheng & Monroe, 2012) were of particular relevance. The findings of the seven studies, including observation data and stakeholders' perspectives, were examined for terms related to autonomy, competence, relatedness, and connection to nature. Studies that identified any of these as the main theme were given the highest rating for topic relevance.

2.10 Synthesis of Findings

This review aimed to investigate if and how FS promotes wellbeing in children. Wellbeing was explicitly referenced in the introductions to four of the studies (Coates & Pimlott-Wilson, 2019; Harris, 2017; L. O'Brien, 2009; L. O'Brien & Murray, 2007). Apart from one FS practitioner interviewed by Maynard (2007b) who commented that the development of self-esteem was crucial for the child's sense of wellbeing, the term did not reappear as a theme in any of the study's findings. This may be explained by the breadth of the construct (R. M. Ryan & Deci, 2001) or the fact that wellbeing in children has not been well defined in the literature and there exists a dearth of measurements of the construct (Liddle & Carter, 2015; Tennant et al., 2007).

Despite wellbeing not featuring as a distinct outcome in any study, the findings document a range of important indices of positive functioning. These include experiencing success, making friends, confidence, motivation, and concentration. In order to advance the potential of SDT and NC as potential frameworks for wellbeing in

FS empirical evidence of autonomy, competence, relatedness, and nature connectedness was examined.

2.10.1 Autonomy.

Autonomy featured as a theme across all seven studies. Freedom emerged as the main theme in interviews with FS leaders, being referenced by 17 out of the 20 practitioners (Harris, 2018). Other terms related to autonomy, including choice, free-play, independence, and child-led learning, appeared as sub-themes or within broader themes in the other studies. FS should follow "a regular routine…that is learner-led and facilitated by trained leaders" (IFSA, n.d.). This sense of self-authorship aligns with autonomous behaviour (Barrable & Arvanitis, 2019). Child-led learning was evident in several of the studies reviewed.

The opportunity to make choices about one's learning provides a sense of control, enabling a child to engage in activities that are interesting and meaningful. In contrast to negative freedom, void of any outside involvement, making active choices is framed as positive freedom (Arvanitis, 2017). Interestingly, freedom and choice were brought together in one study to title one of the sub-themes (Coates & Pimlott-Wilson, 2019). In this case, freedom was related to the outdoor environment, which afforded the children different opportunities to the classroom environment. Children did not associate learning at FS with work to the same extent as they did in the classroom. One child reported that "you get to do what you want, at the right time" (p.29) while another suggested "you can be yourself every single time" (p.28).

Harris (2018) explored freedom further, looking at FS as a behavioural space, with different norms to the classroom, and as a space apart from the British curriculum. Here freedom and choice were intertwined, indicative of positive freedom, such as the opportunity to choose how to engage in activities. This suggested that children were making decisions within an overall structure. Practitioners referred to 'light touch monitoring', acknowledging that even though children are leading the learning, the adults are always tuned in. The children interviewed by Coates and Pimlott-Wilson (2019) accepted the need for adult supervision in some situations, for example during fire lighting, but apart from explicitly risky activities described it as "help when it is needed" (p.32). This suggested that children were aware of boundaries and knew that adults were there to keep them safe. However, the adults did not seem to interfere unless

the child sought their help or could not make progress independently: “Sometimes, I am only there to keep them safe, they don’t need me.” (K. Bradley & Male, 2017, p. 89).

Independence was a term that featured across several studies. While independence is differentiated from autonomy in SDT literature (R.M. Ryan and Deci 2006), examples of what authors described as independence were important to include. The opportunity to choose to engage in an activity independently was a strategy used to mitigate social conflict for some children (Coates & Pimlott-Wilson, 2019). The balance between learning to cooperate and to be independent also emerged in two practitioner interviews (Harris 2017).

Both parents and educational professionals referred to the increased independence the children had gained from FS, reflected in their “dilemma of balancing the children’s increasing wish for independence and autonomy against the need to keep them safe” (K. Bradley & Male, 2017, p. 89). Independence also featured as a subtheme of the theme ‘physical skills’, with children observed to gain independence through physical activity and movement (L. O’Brien & Murray, 2007). The development of the skills necessary to navigate the environment gave children the confidence to explore.

Opportunities to engage in play were linked to increased autonomy across several studies. Children associated the freedom of FS with more opportunities to engage in play. In some studies, free time or free play was a planned element of FS (L. O'Brien, 2009). In others, children were observed during play, including imaginary play, and activities were based upon their interests to increase motivation (Coates & Pimlott-Wilson, 2019). By following the children’s lead, adults became participants in the play, which shifted the power in the relationship. Practitioners reported that structured play was used less often as children got older and depended less on adults (Harris, 2017). The children were able to transfer the skills they had learned to facilitate their own play (L. O'Brien, 2009).

2.10.2 Relatedness.

Relatedness, as a basic need, is satisfied when a person experiences connectedness with others, including caring for others and being cared for (Deci et al., 2013). Relatedness emerged in the outcomes of all seven studies, from both children’s and adults’ perspectives. Associated terms included collaboration, teamwork, interaction with peers, relationships, social skills, and friends. Relatedness was a central theme in four of the seven studies.

Engagement in FS appeared to foster positive relationships between children, between children and educators and to transcend into relationships in children's home environments. The importance of teamwork, spoken about by Harris (2017), was reflected by L. O'Brien "they (the children) have bonded as a group" (2009, p. 51) and L. O'Brien and Murray "cooperating well with a partner" (2007, p. 256). Children were observed to demonstrate improved awareness of the consequences of their actions on others (L. O'Brien, 2009) and to develop communication skills through new relationships (Harris, 2017). Some children even framed peers as the first responder if they experienced difficulty (Coates & Pimlott-Wilson, 2019).

Collaboration and teamwork emerged as one of three main themes when children were asked about their learning opportunities at FS (Coates & Pimlott-Wilson, 2019). Increased opportunities to interact with peers was frequently discussed, particularly by the 8-9 year-olds. The children reflected that the space and the activities at FS were more conducive to group-work compared to the classroom. They acknowledged that shared goals required compromise: "So, we would all pick one thing and put it all together so then it would make a super cool den!" (Coates & Pimlott-Wilson, 2019, p. 33). While the older group reported the benefits of learning from peers with whom they may not ordinarily spend time, the younger cohort in this study (4-5 year-olds) were more focused on developing social boundaries in the new environment.

Relatedness also emerged as a significant theme for K. Bradley and Male (2017), which was of significance as the children in their sample all had a diagnosis of ASD. Persistent deficits in social communication and difficulties in making friends or interest in peers are amongst the diagnostic criteria for ASD (American Psychiatric Association, 2013). It was particularly interesting that friendships emerged as a main theme from the children's perspective, reiterated by a TA who stated "The group dynamics have changed, and relationships and friendships have been built. This has had a really positive impact." (K. Bradley & Male, 2017, p. 88). The gravitation towards peers over adults was noted to increase over time.

The adult-child relationships that were established through practitioners sharing the child's activities and focusing on them were illustrated by Maynard (2007b). The FS practitioners interviewed suggested that the development of an adult-child relationship in the FS ethos was based on how they thought about the child. The practitioners emphasised that it is vital that children are viewed as naturally capable. The aim is to

encourage children to share their ideas and collaborate with both adults and peers alike. The secure relationships that are fostered between children and their caregivers can form a secure base from which children can explore the environment.

New perspectives emerged as a theme for L. O'Brien (2009) and focused on the potential of FS to enable teachers to see children in a different context and develop different relationships as they face challenges with them. This was also reflected by the TA's in another study: "I suppose it is quite difficult knowing how much to push the boundaries, but as long as you stay close to the child and you know that child, you understand how far they will stretch the boundaries" (K. Bradley & Male, 2017, p. 88). The opportunity to interact in a different environment appeared to change the dynamics in adult-child relationships.

2.10.3 Competence.

As a basic need, competence is linked to a person's feelings of "increased mastery and effectance" (N. Adams, Little, & Ryan, 2017, p. 47). Therefore, feelings of competence are not contingent on absolute achievement but on improvement. Opportunities to experience competence from practitioner's perspectives included decisions they made about the structure of sessions, inclusion of appropriate risk, and the feedback given to children. In studies that included children's perspectives, they reported learning to manage risks and stretch their comfort zones.

Children reported feelings of increased mastery through overcoming challenges in FS. These included climbing (K. Bradley & Male, 2017), using saws, and lighting fires (Coates & Pimlott-Wilson, 2019). Others reported how the culmination of craft and tool use skills, developed over time, resulted in creations that were "absolutely amazing" (Coates & Pimlott-Wilson, 2019, p. 30). While the children perceived their decision to engage with these challenges as autonomous, it was evident that practitioners had carefully planned that opportunities to experience challenges would be part of the sessions (K. Bradley & Male, 2017).

Progression in learning as children get older, tool use, and experimentation emerged as themes from practitioner interviews (Harris, 2017). The concept of increased mastery, as opposed to ultimate achievement, was clearly understood by practitioners, stating "we're not expecting them to reach a certain level, we are supporting them to reach the level that they can reach themselves" (Harris, 2017, p. 280). The provision of feedback to children regarding the progress they made was

addressed by the practitioners in one study. They emphasised "the importance of praising real effort and achievement" (Maynard, 2007b, p. 324).

2.10.4 Connection to nature.

One of the aims of FS is to support the development of a relationship between the learner and the natural world (IFSA, n.d.). Elements of a connection with nature emerged from both children and practitioner perspectives across all studies. The opportunity to develop a relationship with nature or woods was one of the most commonly mentioned themes from practitioners' perspectives (Harris, 2017). For children, being outside was an important dimension of the FS experience (Coates & Pimlott-Wilson, 2019).

Enjoyment of nature featured across several studies. Memorable experiences for children included playing in the mud (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019) and holding spiders (Coates & Pimlott-Wilson, 2019). The tactile nature of the woods was associated with enjoyment. The use of natural materials found onsite created endless opportunities for creative play (L. O'Brien & Murray, 2007). The opportunity to pick up and touch things, along with the excitement of seasonal change, increased wonder and curiosity (Harris, 2018). This interest in the environment appeared to permeate into the home environment. Parents reported how their children enjoyed pointing out elements of nature following their FS experience (L. O'Brien & Murray, 2007) and engaged in outdoor activities that they would not have explored previously (K. Bradley & Male, 2017).

The woodland environment also brought challenges. Initially, it was an unfamiliar and scary place for many children (Coates & Pimlott-Wilson, 2019). One child expressed his dislike of the dogs that entered the forest (K. Bradley & Male, 2017). These fears and uncertainties were recognised by the practitioners as challenges. The emphasis was overwhelmingly on learning to become comfortable amid such challenges through curiosity and the reassurance of responsive adults (L. O'Brien & Murray, 2007).

Risk and challenge, integral elements of FS practice, were linked with the development of responsibility. Children recognised the importance of safety in the outdoor environment. In order to engage in desired activities, such as tree climbing or exploring, children had to learn to negotiate the natural environment (L. O'Brien & Murray, 2007). Children referred to avoiding getting stung by nettles and tripping over

twigs, demonstrating their awareness of the physical features of the world around them (Coates & Pimlott-Wilson, 2019). The increased responsibility and ability to assess risks for themselves enabled the children to push their boundaries and explore the environment in new and exciting ways.

Knowledge and understanding of the environment featured as a theme across several studies. Although nature education emerged as one of the most common themes across practitioner interviews (Harris, 2017), learning about the environment is not a primary goal of FS. The learning described across the studies occurred incidentally, based on the children's natural curiosity about the world around them (L. O'Brien, 2009). Children demonstrated an awareness that they were learning about nature through FS. However, the sensory, hands-on experiences differed from traditional classroom learning: "you're still learning about the environment – you can see lots of birds and animals" (Coates & Pimlott-Wilson, 2019, p. 31). Parents and teachers also recognised the increased interest in nature and development of nature-based vocabulary (K. Bradley & Male, 2017; L. O'Brien & Murray, 2007).

Respect for the environment was observed by FS practitioners across four studies. Similar to a knowledge of nature, respect is not an explicit aim of FS. In some cases, FS practitioners recognised that learning about living things and learning to respect them related closely to their own beliefs (Maynard, 2007b). As children developed a relationship with nature and an attachment to the site, they were observed to engage in more pro-environmental behaviour (Harris, 2017). Children shared their increased knowledge and understanding of the plants and animals around them to inform others how to protect them (L. O'Brien, 2009; L. O'Brien & Murray, 2007). Empathy towards the natural world was associated with the development of relationships between children and the woodland sites (Harris, 2017).

2.11 Defining Forest School

Despite a rigorous review of pertinent literature, no clear definition of FS emerged. The description of FS most widely cited in the reviewed literature (e.g., by Mackinder 2017; L. O'Brien, 2009) was that of the UK Forest School Association (see Section 1.5). The lack of consensus on a definition of FS may reflect the lack of an agreed theoretical framework behind the practice. Based on the outcomes of this systematic literature review, the researcher attempts to address this gap by proposing the following working definition of FS:

Forest School is a commitment to engage children in regular, outdoor learning in a woodland setting. In FS, children are actively given opportunities to direct their learning through play and to develop a connection with themselves, with others and with the natural world. These connections, alongside clear boundaries, offer children a safe base from which to experience risk and challenge.

2.12 Summary

This systematic review of the literature reiterated that there is a gap in research explicitly focusing on the impact of FS on wellbeing. Many of the studies included took a primarily exploratory approach to investigate the impact of FS on a broad range of outcomes, including learning, social and emotional development, and physical skills. With regard to the specific aim of the review, to explore if experiences of autonomy, competence, relatedness (Deci & Ryan, 1985), and nature connectedness (Cheng & Monroe, 2012) feature in empirical research with children in FS, indicators such as motivation and concentration, collaboration and teamwork, and nature engagement emerged as themes in the studies reviewed (Coates & Pimlott-Wilson, 2019; Harris, 2017; L. O'Brien & Murray, 2007). This suggests that SDT and NC, as theoretical frameworks for wellbeing, are worthy of further study within this population.

The lack of the child's voice emerged as a gap in the studies reviewed and will be addressed by the current study. Although child-centred practice is undoubtedly at the core of FS philosophy, this did not appear to translate into the research designs utilised in this review. Four studies included children as part of their research sample (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; L. O'Brien, 2009; L. O'Brien & Murray, 2007). However, only two of the studies elicited the perspective of the children on their experience (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019). Consideration will be given to the inclusion of methodologies that elicit children's perspectives on their own experiences.

All of the studies included in this review were from the UK, where FS is a more established practice than in Ireland. The current study aims to extend the research base for FS in the Irish context. This is timely as FS is accessed by children in an increasing number of Irish primary schools (IFSA, n.d.).

FS is a unique form of outdoor education pedagogy. Aspects of FS that purport to differentiate it from merely being outdoors include the presence of a trained leader, an emphasis on risk-taking, the centrality of play, and child-led learning in a social

constructivist paradigm (Knight, 2018). Many of these principles theoretically align with SDT as a framework for wellbeing (Barrable & Arvanitis, 2019). In line with the "threshold model" a social context, such as FS, must be generally supportive of the three basic needs to optimise experiences of wellbeing (Deci et al., 1994, p. 138). Consequently, diminished need satisfaction will predict diminished wellbeing (Deci & Ryan, 2000, p.263).

As SDT is an empirical theory, data will be collected to examine the degree to which individuals' experience in FS reflects a predicted theoretical pattern. If FS practice in Irish primary schools provides opportunities for children to experience perceived autonomy through self-directed learning, perceived competence through risk-taking and skill development, and perceived relatedness through playing and working with others it is expected that they will enjoy FS and be motivated to engage. In contrast, if FS is perceived as restrictive and adult mediated, if activities are either too easy or too difficult, and if experiences of relationships are negative therein, it is expected that they will not enjoy FS and not be motivated to engage.

Exposure to a woodland environment and the development of a relationship with nature is an important dimension of FS practice (Harris, 2017). As outlined in this chapter, the body of literature linking nature connectedness and wellbeing is robust (Bratman et al., 2019; Mayer et al., 2009; Pritchard et al., 2019). Learning experiences in nature may have the potential to influence the development of children's connection with nature. This study aims to establish the extent to which the natural environment is linked to children's experiences at FS (Cheng & Monroe, 2012). A further aim is to explore the extent to which time spent in a natural environment may predict wellbeing as opposed to other distinct aspects of FS pedagogy.

2.13 Research Questions

Three research questions (RQs) to be answered in this study are detailed below:

RQ 1: What is happening during Forest School sessions?

RQ 2: Can children's experiences be explained by self-determination theory?

RQ 3: Can children's experiences be explained by nature connectedness?

3. Empirical Paper

Chapter 3 of the thesis details the current study. Section 3.1, Introduction, positions the research within the current educational and societal context. It outlines the increased emphasis on wellbeing across society, recognises the prevalence of mental health difficulties and points to the emphasis on wellbeing promotion in educational settings, including the role of the EP. The key elements of this thesis are summarised, namely FS, SDT and NC. A clear rationale for the research is provided, with reference to the dearth of theoretical frameworks underpinning research on wellbeing in FS. The research questions are presented, as informed by the literature review.

3.1 Introduction

The desire to uncover what makes a good life is at the core of our attempts to make society a better place in which to live (Huta & Waterman, 2014; R. M. Ryan & Deci, 2001; Yangmei et al., 2017). This desire has brought the concept of wellbeing to the fore across research, policy, and commercial domains (J. Ryan et al., 2019). Historically, mental health and wellbeing were used interchangeably to connote the absence of mental illness. With the emergence of positive psychology, focus has shifted to positive aspects of wellbeing, including quality of life, strengths, and resources (Seligman & Csikszentmihalyi, 2000). This shift is reflected in terminology, with mental health and wellbeing used to describe positive states of being (Svane et al., 2019). Two key perspectives have emerged in an effort to conceptualise and operationalise wellbeing (Disabato, Goodman, Kashdan, Short, & Jarden, 2016; R. M. Ryan & Deci, 2001). Hedonic wellbeing refers to subjective wellbeing or the attainment of pleasure, including positive emotions and life satisfaction (Diener & Lucas, 1999). Eudaimonic wellbeing is more closely associated with psychological wellbeing, focused on meaning, self-actualization and personal growth at an individual level and shared values and goals at a societal level (Delle Fave, Brdar, Freire, Vella-Brodrick, & Wissing, 2011; Massimini & Delle Fave, 2000; Ryff, 1989). Broadly speaking, the hedonic approach is concerned with subjectively determined positive affective states, whereas the eudaimonic approach focuses on experiences that are considered good for the person from an objective perspective (McMahan & Estes, 2011).

Although hedonic and eudaimonic wellbeing have informed two separate bodies of research, positive correlations across hedonic and eudaimonic measures suggest that there exists some overlap between the two perspectives (Disabato et al., 2016; Huta &

Ryan, 2010). Essentially, higher levels of general wellbeing occur when people experience both hedonic wellbeing and eudaimonic wellbeing (Capaldi et al., 2014; Huta & Ryan, 2010). The multi-dimensional nature of wellbeing is reflected in the World Health Organisation (WHO) definition, which includes the realisation of one's potential, resilience, physical wellbeing, having a sense of purpose, and connectedness (WHO, 2001). National and educational policies in Ireland have adopted this broad approach, encompassing emotional, psychological, physical, and spiritual wellbeing (DES et al., 2015, p. 9).

3.1.1 Prevalence of mental health difficulties.

The reported prevalence of mental health difficulties in children and adolescent populations is a cause for concern, both nationally and internationally (Hoyne & Cunningham, 2019; Morris et al., 2011). National figures reported by the Child and Adolescent Mental Health Service (CAMHS) indicate that 1 in 10 children and adolescents meet the criteria for a mental health disorder (HSE, 2013). Figures published more recently in the UK indicate that the prevalence of children with a mental health disorder there is 1 in 8 (NHS, 2018). Mental health disorders and wellbeing are not one and the same (Patalay & Fitzsimons, 2018). Broadly speaking, markers of wellbeing may act as a protective factor in populations with and without mental health disorders (Esteban-Gonzalo et al., 2019). Adolescents in a clinical sample, attending a child and adolescent psychiatry service, who self-reported high levels of self-esteem at baseline were found to have lower symptoms of anxiety, depression and attention problems three years later (Henriksen, Ranøyen, Indredavik, & Stenseng, 2017). Positive relationships at home and in school are another dimension of wellbeing shown to contribute to positive functioning (Bradshaw, Crous, Rees, & Turner, 2017; Sabolova, Birdsey, Stuart-Hamilton, & Cousins, 2020). However, children with a mental health disorder commonly experience lower wellbeing than children without such disorders (NHS, 2018). A comprehensive approach to wellbeing, therefore, includes prevention, amelioration, and promotion.

3.1.2 Wellbeing promotion.

Wellbeing promotion includes both universal and targeted interventions. These focus on promoting mental health and preventing mental disorders, with school-based interventions making up approximately 10% of those reported worldwide (WHO, 2017). Educational and health policies highlight, from a systems perspective, the

potential role of the school setting in wellbeing promotion (DCYA, 2014; DES, 2019b). Wellbeing is increasingly considered a critical focus for schools as the body of research linking wellbeing and learning grows (Miller, Connolly, & Maguire, 2013; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009; Svane et al., 2019). Wellbeing is part of Irish educational curricula in both primary and post-primary schools, offering students opportunities to learn about wellbeing (DES, 2019b; NCCA, 1999; 2009, 2011, 2017). A positive school climate, relationships, and a sense of safety and belonging are somewhat less tangible, yet equally important, aspects of school-based wellbeing promotion (DES, 2019b).

3.1.3 Role of the educational psychologist.

Both education and educational psychology are situated in a broader political and social climate (Passenger, 2013). The 'Wellbeing Policy Statement and Framework for Practice', launched in October 2019, stipulates that all schools must demonstrate a process of school self-evaluation across four key areas of wellbeing promotion by 2023 (DES, 2019b). In the school context teachers are well placed to deliver school-wide or group interventions (Franklin et al., 2017). Educational psychologists (EPs) also have a fundamental role to play. The role of the EP is commonly conceptualised as that of a scientist-practitioner, using psychological skills, knowledge, and understanding at organisational, group or individual levels for the benefit of the CYP (Fallon, Woods, & Rooney, 2010). With a move away from the medical model of assessment and remediation, EPs are increasingly well positioned to work with the systems around a child (Beaver, 2011). This ecosystemic model of practice includes consultation and systemic work alongside more traditional assessments (NEPS, 2003, 2007b).

EPs work with schools to support all children and young people, as well as those at greater risk or who require more targeted support (NEPS, 2003, 2007b). In addition to supporting schools to implement evidence-based practices, EPs may be well positioned to appraise programmes or approaches which schools report are working in the real-life context, a complementary approach known as practice-based evidence (Green, 2008). Forest School is one example of a school-based practice associated with wellbeing, albeit with a limited empirical base.

3.1.4 Forest School.

In the school setting, FS is a commitment to engage children in regular, outdoor learning. During FS sessions, it is intended that children are given opportunities to direct their own learning through play and to develop a connection with themselves, with others and with the natural world (Coates & Pimlott-Wilson, 2019; Harris, 2017; Maynard, 2007b). Forest School practice has, to a large extent, preceded theoretical development (Harris, 2017). The body of research that does exist is mostly exploratory. Key themes that have emerged relating to potential benefits include increased confidence and self-esteem, increased motivation, greater knowledge, and understanding of nature, improved physical skills, risk-taking and challenge, and developing relationships (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; Harris, 2017, 2018; Maynard, 2007b; L. O'Brien, 2009; L. O'Brien & Murray, 2007). A study published this year highlighted the paucity of explanatory research as a rationale for the use of theory of change methodology to evaluate the impact of FS on emotional wellbeing for CYP with mental health difficulties (Tiplady & Menter, 2020). Although FS is still an alternative practice, the movement is increasingly positioned between formal and informal learning environments, with the potential to situate outdoor learning within mainstream schools (Harris, 2017; Pimlott-Wilson & Coates, 2019). Coupled with the prominence of wellbeing in educational policy, further research into experiences of wellbeing in FS is timely.

3.1.5 Self-determination theory.

Self-determination theory asserts that there are three basic psychological needs associated with optimal growth and development (Deci & Ryan, 1985; R. M. Ryan & Deci, 2000). These needs are autonomy, competence, and relatedness. Autonomy refers to the need to behave in a manner that is congruent with one's values and interests, competence refers to the need to feel confident and effective in one's actions, and relatedness refers to the need to be accepted, connected to, and cared for by others (R. M. Ryan & Deci, 2002, pp. 7-8). SDT assumes that humans are inherently active, growth orientated organisms (Barrable & Arvanitis, 2019; R. M. Ryan & Deci, 2000). The theory hypothesises that the opportunity to be self-determined enables individuals to engage in goal-focused behaviours and actualise their potential (Hyde & Atkinson, 2019; Sproule et al., 2013). SDT recognises that social context significantly influences

the extent to which the three basic needs are supported or obstructed (Wilding, 2015). A social context must be generally need-supportive to optimise wellbeing (Deci et al., 1994). SDT is synopsised in Figure 3.1.

Figure 3.1. An overview of Self-Determination Theory. Adapted from Legault (2017).

SDT is primarily a theory of motivation. A body of SDT research details what may be viewed as a continuum of motivation, including amotivation and variations of intrinsic and extrinsic motivation (Guay, Ratelle, & Chanal, 2008). As SDT assumes that individuals naturally possess intrinsic motivational tendencies, the theory focuses on the maintenance and enhancement of intrinsic motivation (R. M. Ryan & Deci, 2000, p. 70). SDT has been examined across education, work, sport, and care settings using a range of methodologies and the core motivational processes are consistent (Gagné & Deci, 2005; Hyde & Atkinson, 2019; Niemiec & Ryan, 2009; Ntoumanis, 2001). In education settings, the ability to foster students' propensity to engage and to learn is a valuable resource to teachers (Niemiec & Ryan, 2009). When an individual is intrinsically motivated, behaviours are executed because they are inherently enjoyable (A. E. Thomas & Mueller, 2017). Intrinsic motivation is characterised by positive emotions and facilitates social development and psychological wellbeing (Deci et al., 2013; Guay et al., 2008).

Within outdoor education, SDT has elucidated practice in domains including outdoor science teaching (Dettweiler, Ünlü, Lauterbach, Becker, & Gschrey, 2015), adventure programmes (Sproule et al., 2013) and physical activity (Christiana, Davis, Wilson, McCarty, & Green, 2014). Forest School, in the literature, purports to facilitate children's motivation through self-directed learning (Waite et al., 2016). Although a conceptual article by Barrable and Arvanitis (2019) linked SDT and FS, this link has not yet been examined empirically. The article proposes that elements of FS practice

including choice, autonomy supportive communication, affordances of nature, optimal risk and challenge, social relatedness, and nature relatedness have the potential to meet the need for autonomy, competence, and relatedness (Barrable & Arvanitis, 2019). However, this conceptualisation is based on ideal FS practice, largely in the UK. Forest School practice in Irish schools may be influenced by the school culture and policy. For example, although the aim of FS is not to deliver a particular educational curriculum, sessions run in schools may have to consider curricular links (Murphy, 2018). Furthermore, the child-led approach contrasts with the norm of teacher-directed curriculum delivery (Maynard, 2007a). As research in the Irish context is limited, the first research question to be answered is '*What is happening during Forest School sessions*?'. To date, a SDT lens has not been applied to observed Forest School practice. This study sought to do so by answering a second research question '*Can children's experiences be explained by self-determination theory?*'.

3.1.6 Nature connectedness.

The body of research linking FS and wellbeing extends beyond that alluded to in relation to self-determination. The biophilia hypothesis posits that humans have an innate need to feel connected to the natural world and attend to natural elements and processes (Kellert & Wilson, 1995; E. O. Wilson, 1984). Although there is limited empirical research to support the biophilia hypothesis as a biological predisposition, it underpins a diverse body of research into the connection between nature and wellbeing. Two dominant theories that have emerged are attention restoration theory (Kaplan & Kaplan, 1989) and stress reduction theory (Ulrich et al., 1991). These underlie a large body of the research into the effects of connection with nature on aspects of wellbeing (Han, 2017; Mårtensson et al., 2009; Passmore & Holder, 2017; Richardson, Richardson, Hallam, & Ferguson, 2019; Roe & Aspinall, 2011).

Nature connectedness is a psychological construct that relates to an individual's subjective sense of their relationship with the natural world (Mayer & Frantz, 2004). In addition to the benefits of simply being in nature, there is increasing evidence that suggests NC has important implications for wellbeing (Capaldi et al., 2014; Nisbet et al., 2009; Pritchard et al., 2019; Richardson et al., 2019). Though the biophilia hypothesis posits that human beings' need to affiliate with nature is innate, connectedness to nature acknowledges that "there is considerable variability in the extent to which individuals are drawn to and feel connected to nature" (Nisbet et al.,

2011, p. 304). The construct of NC is essentially a personal relationship with the natural world (Capaldi et al., 2014; Pasca et al., 2017; Tam, 2013). A meaningful connection with nature has been linked with different elements of wellbeing, including life satisfaction (Mayer & Frantz, 2004) and happiness (Nisbet et al., 2011). Recent meta-analyses have demonstrated that people who self-report a stronger connection with nature also self-report greater hedonic and eudaimonic wellbeing (Capaldi et al., 2014; Pritchard et al., 2019).

Research into the pathways to NC with an adult population suggests that activities in nature involving the senses, emotions, noticing beauty, and feeling compassion towards the natural world may be greater predictors of a relationship with nature than knowledge-based activities (Lumber et al., 2017). This may imply that appropriately designed, nature-based interventions have an important role to play in improving wellbeing. However, studies examining NC and wellbeing in children are less extensive than in adult populations. Some indicators of a link between NC and wellbeing in this population include improved emotional and cognitive regulation (Bakir-Demir, Berument, & Sahin-Acar, 2019) and fewer reported difficulties by parents on the SDQ (Sobko et al., 2018). A study comparing the psychological and social benefits of a nature school intervention, not dissimilar to FS, and a museum intervention demonstrated that children attending the nature school reported higher levels of connectedness to nature and higher positive and negative emotions (Dopko, Capaldi, & Zelenski, 2019). Another study with four to eleven year old children demonstrated that they did not have the same preference for natural over urban environments as was predicted based on adult populations, although their preference did change as they got older (Meidenbauer et al., 2019). It is hypothesised that these findings may be related to exposure, as children who spend more time in nature report a stronger connection to nature (Cheng & Monroe, 2012). Consequently, nature-based interventions may have a role to play in providing critical opportunities for children to develop a connection to the natural world and promote wellbeing.

Forest School, as a form of outdoor education, is well positioned to offer children a regular opportunity to access nature. A study with eleven and twelve year olds engaging in a five-week block of FS showed that connection to nature increased more for male participants compared with female participants, although females' mean score on the connection to nature measure was higher overall (Roberts, 2017). Nature connectedness and early environmental experiences were predictors of wellbeing

(Roberts, 2017). Engagement with and enjoyment of nature have emerged amongst a broader range of outcomes in exploratory studies of FS (Harris, 2017; L. O'Brien, 2009; L. O'Brien & Murray, 2007). This is more clearly demonstrated in a synthesis of FS research by Smith, Dunhill and Scott (2018) which identified indicators of the development of a positive relationship with nature for participants. As most of the studies examined have not explicitly focused on NC in FS, this study sought to answer a third research question '*Can children's experiences be explained by nature connectedness?*'.

3.2 Method

3.2.1 Overview

This section outlines the research design for the current study. The section begins with the research aim and an overview of the case study design. Thereafter, the specific components of the case study; the research question, propositions, unit of analysis, logic for linking the data to the propositions and criteria for interpreting findings are explored. The sampling strategy, measures, data collection procedures, ethical considerations and methods of data analysis are outlined and discussed.

3.2.2 Research aim.

This study sought to investigate if SDT and NC can explain children's experiences of wellbeing at FS. The aim, therein, is to expand upon theoretical frameworks related to wellbeing in this context. The study also sought to explore how FS was delivered to primary school children in Ireland as previous research in this context is limited.

3.2.3 Case study design.

This research used an explanatory 'two case' case study design. A case study explores "a contemporary phenomenon in depth…especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18). This research project explored FS, a contemporary phenomenon within the Irish primary school context. As has been the case when FS sessions were incorporated into a school context elsewhere (Kemp, 2019), the six principles of FS may be adapted to meet the particular school context. The boundaries between the phenomenon and context are blurred, making a case study a suitable design.

The researcher had identified theoretical frameworks within which to explore FS. The study sought to explore how SDT and NC might explain the experiences of wellbeing evidenced in the literature review (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; Maynard, 2007b; L. O'Brien, 2009; L. O'Brien & Murray, 2007). A case study design is applicable when the research question seeks to explain how or why a social phenomenon works (Yin, 2014).

A multiple case study design enabled the researcher to explore experiences of FS in depth, from a range of perspectives and data sources across two schools. Data was gathered from children who took part in FS and their parents as well as FS leaders and

teachers. Multiple cases can be viewed as multiple experiments (Yin, 2014). Cases are chosen based on replication logic. A case that predicts similar results is called a literal replication while a case that predicts contrasting results for anticipated reasons is called a theoretical replication. The second case in this study was selected based on literal replication. Research findings including evidence from more than one case can be considered more robust (Yin, 2009).

3.2.4 Components of a case study design.

According to Yin, there are five essential components to be addressed in a case study design: the study's questions, its propositions, its unit of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings (2009, p.27). These components were considered in the current study and are discussed in the proceeding sections.

3.2.5 Research questions.

There were three research questions (RQs) to be answered in this study:

RQ 1: What is happening during Forest School sessions?

RQ 2: Can children's experiences be explained by self-determination theory?

RQ 3: Can children's experiences be explained by nature connectedness?

3.2.6 Case propositions.

Explanatory case studies use case results to support a theory or construct a new way of explaining a phenomenon (Yin, 2014). Theoretical propositions direct attention to what should be examined in an explanatory case study. Theoretical propositions for this study were drawn up before data collection, based on SDT and NC, and are outlined in Figure 3.2. These propositions were used to guide data collection and discern relevant analytic strategies (Yin, 2009).

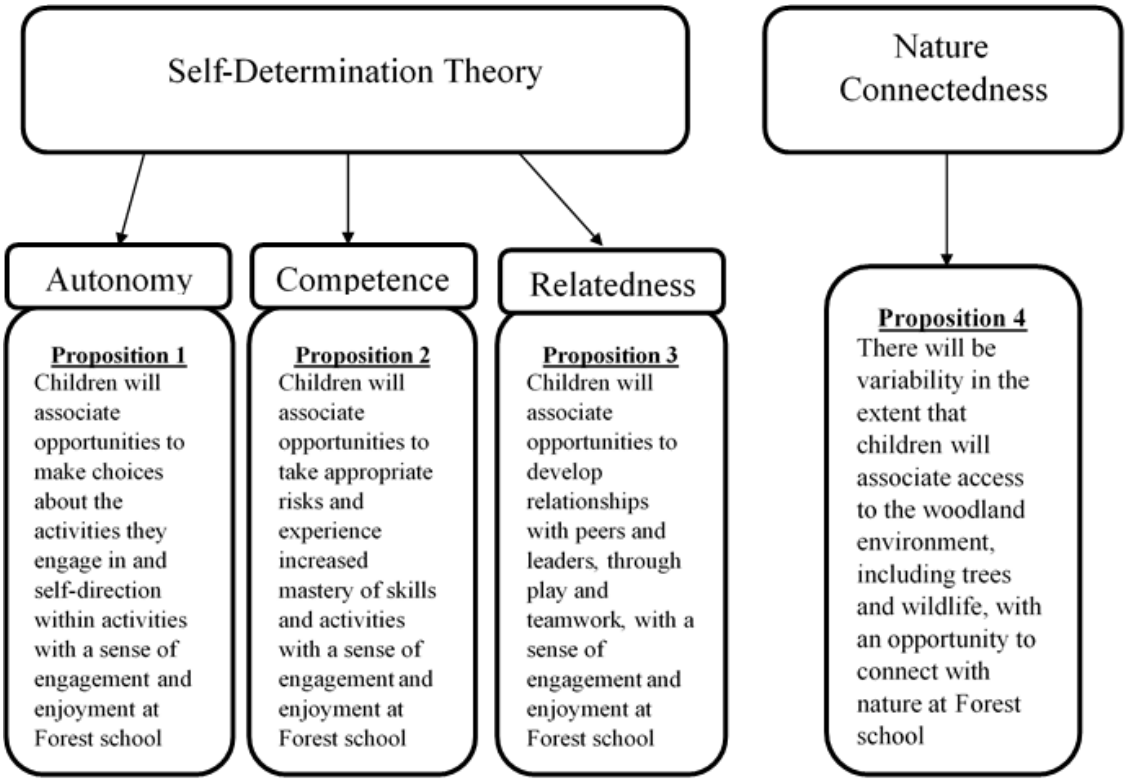

Figure 3.2. Case study propositions.

3.2.7 Unit of analysis.

The unit of analysis essentially defines what the case is (Yin, 2009). In this research project, the unit of analysis is FS. The study specifically focuses on FS in the primary school context. The proceeding sections on the sampling strategy and the participants provide a more comprehensive overview of the makeup of each case.

3.2.7.1 Sampling strategy for the cases.

Strategic sampling is important in case study research (Flyvbjerg, 2006). Purposive sampling was used to identify cases that could provide empirical data to answer the research questions (Curtis, Gesler, Smith, & Washburn, 2000). The primary criteria for inclusion are outlined in Table 3.1 with a more detailed sampling strategy included in Appendix D.

Table 3.1

Case Sampling Strategy

Criteria	Rationale
A block of Forest School sessions in a primary school	Regular sessions reflect the definition of Forest School proposed in Section 2.11 as "a commitment to engage children in regular, outdoor learning in a woodland setting". This was informed by the systematic review of the evidence (see Section 2.10).
Sessions are led by a qualified Forest School leader	A qualified Forest School leader is a core component of Forest School practice (IFSA, n.d.).
Sessions are with children between 2nd and 6th class	These children were deemed the most suitable age range for accessing the data collection measures.

The Irish Forest School Association includes a database of FS providers on its website. Forest School leaders from this database were contacted via email to identify leaders working within primary schools. The principals of the schools identified were then contacted with details of the study. Three schools took part in the study.

3.2.7.2 Pilot case.

One school had received funding to run a four-session project, with a single session in each season. As this case did not provide the block of regular sessions required for complete data collection, it was decided to use this school as a pilot case. The session that fell within the researcher's data collection timeframe was observed, to pilot observation methodologies and recording field notes. The FS leader was interviewed to pilot a semi-structured interview schedule.

3.2.7.3 Participants.

Participants included children, teachers, FS leaders, and parents. Information was gathered from participants through observations, scale measures, and interviews. Each data collection method was based on a different participant sample, each with a different sample size. The sampling strategy for each method was informed by the type of data being collected and an overview is provided in Table 3.2.

Table 3.2

Participant Sampling Strategy

Method	**Sampling Strategy**
Observations	The number of children and Forest School leaders in each observation group was pre-determined by the organisation of groups within each case. All children with parental consent were assigned a code that was used when recording the field notes. No field notes were recorded for children without consent.
Scale Measures	The maximum number of children with parental consent and their own assent to participate in the study completed the scales in each case.
Child Conversations/Semi-Structured Interviews	A sub-sample of participants within each case completed child conversations and interviews as the aim of this qualitative data was to map out patterns in the data set as opposed to quantifying amounts (Fugard & Potts, 2015). Braun and Clarke (2013) suggest that for small scale research using interviews a sample of 6-10 participants is sufficient. The research sought a minimum sample of six participants in each case.

3.2.7.4 Sample.

Case 1 was of a well-established FS programme, with children accessing a 9-week block of half-day sessions every other year, from Senior Infants. Second class participated in this study. As one group worked without a trained leader, participants from this group were excluded, leaving a potential sample of twenty children. Case 2 was of a recently established FS programme, following a pilot project earlier in 2019. Children across the school were attending two blocks of three sessions. This study took place with Sixth class during the first block.

Details of the sample for the scale measures and observations across both cases are outlined in Table 3.3. A more detailed description of Case 1 and Case 2 is included in Appendix E.

Table 3.3.

Overview of Participants

	Case 1	**Case 2**
Class	Second Class	Sixth Class
Age	The children were aged between 7 and 9, with a mean age of 8 years and 4 months.	The children were aged between 11 and 12, with a mean age of 11 years and 6 months.
Scale Measures Sample	N= 16 (7 male, 9 female)	N= 19 (11 male, 8 female)
Observation Sample	N=10 children N=1 Forest School leader	N=15 children N=2 Forest School leaders
Semi-Structured Interview/Child Conversation Sample	N=2 Forest School leaders N=2 Children N=2 Teachers N=2 Parents _____ N=8 Total	N=1 Forest School leader N=2 Children N=1 Teacher N=2 Parents _____ N=6 Total

Two children who assented to an interview were chosen at random to engage in the child conversations. Parents were given an option to provide a phone number on the consent form if they consented to a phone interview. Although children and parents from the sample that provided consent were selected at random, it is recognised that there is a risk of inherent bias in this sampling method as participants with an interest in the research topic may be more likely to engage. One parent and child interviewed in Case 2 were a parent-child dyad. In Case 1, the class teacher assumed the role of a group leader due to logistics. Therefore, a second teacher who was in a position to assume the role of an observer was interviewed in Case 1. This teacher was a special education teacher (SET) in the school. Details of this subgroup of participants are outlined in Table 3.4 (Case 1) and Table 3.5 (Case 2). Pseudonyms are used throughout.

Table 3.4.

Case 1 Interview Participants

Case 1 Interview/Child Conversation Participant Subgroup		
Forest School leader 1	Forest School coordinator; Special Education Teacher in School 1	Jane
Forest School leader 2	Artist engaged through a 'Creativity in the Classroom' scheme	Emmy
Child 1	Age 8	Kate
Child 2	Age 8	Sadie
Class Teacher	Leader of one of the Forest School groups	Lucy
Special Education Teacher	As a teacher he assumed the role of participant-observer during Forest School sessions	Tom
Parent 1	Attended the Forest School session for parents when her child was in Senior Infants	Anna
Parent 2	Parent volunteer for two blocks of Forest School sessions (18 sessions)	Rosie

Table 3.5.

Case 2 Interview Participants

Case 2 Interview/Child Conversation Participant Subgroup		
Forest School leader 1	External to school staff	Eve
Forest School leader 2	External to school staff	Jack
Child 1	Age 12	Robyn
Child 2	Age 12	Finn
Class Teacher	As class teacher he assumed the role of participant-observer during Forest School sessions	James
Parent 1	Had another child attend a Forest School camp	Eleanor
Parent 2	First experience of Forest School	Beth

3.2.8 Linking data to propositions.

The data collected was guided by the case propositions (Yin, 2009) and informed by previous research. The first three case propositions focused on autonomy, competence, and relatedness (R.M. Ryan & Deci, 2000). Self-determination has been studied in physical education with scales used to measure these three basic needs (Standage, Duda, & Ntoumanis, 2005, 2006). A similar approach was adopted in this study. However, the researcher had to adapt a measure of need satisfaction to FS practice. As motivation is a subjective experience that could not be accessed through qualitative measures, engagement refers to the "relatively more public, objectively observed effect" (Reeve, 2012, p. 151). Proposition four related to NC. Previous

research exploring NC following nature-based interventions with children used the Connection to Nature Index (CNI) (Bragg, Wood, Barton, & Pretty, 2013).

Observations have been used in previous studies to provide a thorough description of the FS sessions (Davis & Waite, 2005; Mackinder, 2017; Maynard, 2007a, 2007b). Semi-structured interviews have been successful in eliciting the perspectives of FS leaders, parents, and educational professionals (K. Bradley & Male, 2017; Harris, 2017; Kemp, 2019). As the application of SDT and NC to wellbeing was novel in FS research it was felt that observations and semi-structured interviews may elucidate the scale data and provide a better understanding of the phenomena under study. The data collection methods and procedures employed are outlined in greater detail in Sections 3.2.7.1 – 3.2.7.5 below.

3.2.8.1 Observations.

In line with a constructivist paradigm, the researcher adopted the role of an observer-participant (Creswell, 2018). The observations allowed the researcher to document details about the FS setting and the activities the children engaged in. Field notes were recorded to reduce subjectivity and personal interpretation by capturing the sessions in detail (Mackinder, 2017).

3.2.8.2 Child conversations.

The current study aimed to elicit children's perspectives on their experience of FS. The inclusion of student voice has a valuable role to play in educational research (Flynn, 2015). This is reflected in the Irish context where recent curricular development at post-primary level included a process of listening to student voices and acting on their perspective (Flynn, 2017). Interviews with children were referred to as child conversations, language considered appropriate to this age group. The conversations were structured differently to the adult interviews. The aim was to enable children to express their perspective and for this to be accurately reflected in the study findings.

The child conversations were structured using an adapted version of the 'Draw, Write, and Tell' approach (Angell & Angell, 2013). This child-centred methodology enables children to express their views on their own experiences though a creative process. Children are allowed to draw, write, and to articulate the meaning of their drawing, resulting in an individual narrative. The script used is included in Appendix F. The researcher made written labels based on the spoken narrative. This later guided the

researcher's interpretation of the artwork. This process aimed to reduce power imbalances between researcher and participant and to minimise researcher bias (Angell & Angell, 2013). Versions of this method have been used to successfully elicit the voices of young children in other contexts, including their playground experiences (Knowles, Parnell, Stratton, & Ridgers, 2013), physical activity (Noonan, Boddy, Fairclough, & Knowles, 2016), and in health research (Pope, Tallon, Leslie, & Wilson, 2018).

3.2.8.3 Semi-structured interviews.

Semi-structured interviews were conducted with the teachers, FS leaders, and parents. Semi-structured interviews allowed the researcher to prepare a series of questions relevant to the research questions (see Appendix G) with the flexibility to be responsive to the interviewee and follow up on topics that emerged during the interview process (Robson & McCartan, 2016). Although participants in this study were asked similar questions, it was recognised that participant responses would differ depending on their perspective. Therefore, interview schedules were designed to include questions of a general nature, followed by the use of prompts to allow participants to elaborate on their responses.

3.2.8.4 Scale measures.

Two measures were completed by children with consent to partake in the study (see Appendix H). The children completed the measures individually so that the researcher could read questions or clarify vocabulary to account for different levels of literacy attainment, a strategy employed in previous research with a similar age-group (Rogers & Tannock, 2018). The Basic Psychological Need Satisfaction (BPNS) Scale (Gagné, 2003; R.M. Ryan & Deci, 2000) was adapted to measure the extent to which the three basic psychological needs were satisfied at FS. This is a 21-item scale with seven items to measure autonomy, six items to measure competence and eight items to measure relatedness (see Table 3.6 for sample items). Participants indicated their responses on a 7-point scale, from 1 (*strongly disagree*) to 7 (*strongly agree*). Although the original scale used 'not at all true' and 'definitely true', the adaptation was made to maintain consistency with the Connection to Nature index. Following a pilot of the scale, six items were rephrased without the word 'not' to minimise confusion for children. This reduced the number of items to be reverse coded from nine items to three items. The three subscales achieved acceptable levels of internal consistency (alpha = 0.74 for

autonomy, 0.80 for competence, 0.77 for relatedness), and the overall need satisfaction scale (averaged across all 21 items; alpha = 0.89). This aligns with internal consistency levels obtained in research using the original scale (alpha = 0.69 for autonomy, 0.71 for competence, 0.86 for relatedness and 0.89 for overall need satisfaction: Gagné, 2003).

The Connection to Nature index (CNI; Cheng & Monroe, 2012) was used to measure NC. This is a 16-item index with each item measured on a 5-point scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). The index includes four subscales; enjoyment of nature, empathy for creatures, sense of oneness, and sense of responsibility (see Table 3.6 for sample items). The CNI was found to have a 'high' internal reliability score (alpha = 0.87), similar to that obtained in previous research (alpha =0.87: Cheng & Monroe, 2012).

Two items were included as a brief measure of intrinsic motivation. These items were initially intended as sample items. However, they were administered in the same way as the scales. As these items reflected two of the four items used in previous research in the physical education context (Goudas & Biddle, 1994) it was later decided to include them as a brief measure of intrinsic motivation. The internal consistency across the items was high (alpha = 0.79)

A sample item for each of the measures is outlined in Table 3.6.

Table 3.6.

Sample Scale-Measure Items

Scale/Subscale	**Sample Item**
Autonomy	I feel like I am free to decide for myself how I do things at Forest School
Competence	People at Forest School tell me I am good at what I do
Relatedness	I get along with people at Forest School
Intrinsic Motivation	I enjoy going to Forest School
Connection to Nature	Being outdoors makes me happy

3.2.9 Data collection procedure.

Figure 1.2 (Section 1.6) outlines the overall study structure. Table 3.7 provides an abbreviated version of the case study protocol (see Appendix I for the full version). As the case studies followed a literal replication, data for Case 1 were collected before data for Case 2. A case study protocol increases reliability as it guides the researcher to replicate procedures across cases (Yin, 2009).

Table 3.7.

Case Study Protocol

Case 1	Case 2
Data Collection - Day 1 (Session 3/9)	**Data Collection - Day 1** (Session 1/3)
Data Sources: • Observation of 2.5-hour FS Session • Field notes - documented what happened during the session	**Data Sources:** • Observation of 2.5-hour FS Session • Field notes - documented what happened during the session
Data Collection - Day 2 (Session 5/9)	**Data Collection - Day 2** (Session 2/3)
Data Sources: • Child Conversation – 'Draw, Write, and Tell' activity x2 • Observation - 2.5-hour FS Session • Field notes • Semi-structured interview with FS Leaders (Interviewed together)	**Data Sources:** • Child Conversation – 'Draw, Write, and Tell' activity x2 • Observation - 2.5-hour FS Session • Field notes
Data Collection- Day 3 (Session 7/9)	**Data Collection - Day 3** (Session 3/3)
Data Sources: • Scales - Basic Psychological Need Satisfaction Scale and Connection to Nature Index • Observation - 2.5-hour FS Session • Field notes • Semi-structured interview with Class Teacher • Semi-structured interview with SET	**Data Sources:** • Scales - Basic Psychological Need Satisfaction Scale and Connection to Nature Index • Observation - 2.5-hour FS Session • Field notes • Semi-structured interview with Class Teacher
Data Collection – Day 4 (9/9 sessions)	**Data Collection – Day 4** (3/3 sessions)
Data sources: • Semi-structured interview with a parent X2	**Data sources:** • Semi-structured interview with a parent X2 • Semi-structured interview with FS Leader

3.2.10 Ethical issues.

Prior to the research taking place, the researcher sought ethical approval from the Mary Immaculate Research Ethics Committee (MIREC) (see Appendix J). The study was also guided by The Psychological Society of Ireland 'Code of Professional Ethics' (PSI, 2010). In line with these guidelines, the researcher had a responsibility to provide participants with relevant information in a format that could be easily understood before a decision to participate was made. Prior to data collection each participant received an information sheet and consent form (see Appendices K-S).

Children are a particularly vulnerable population (Yin, 2009). Careful consideration had to be given to including children in the study. In line with the UN Convention on the Rights of the Child, a child who is capable of forming his or her own views has "the right to express those views freely in all matters affecting the child" (Children's Rights Alliance, 2010, p. 15). Children in primary school can form views on their education, and therefore it was ethical that they are given a voice in research conducted on their educational experiences. The researcher had to consider that the research methods chosen reflected children's rights standards, including that they were safe, inclusive and engaging; flexible and responsive to the children's needs and that participation was optional (Lundy & McEvoy, 2009). The children's information sheet was presented in a child-friendly format and explained verbally (see Appendix R). All participants were informed that participation was voluntary. Children provided their own assent after the acquisition of school and parental consent. Children were given the opportunity to express their views through drawing, writing, and answering questions.

3.2.11 Interpreting the findings.

Multiple methods of data collection were used in this study. Therefore, different analytic techniques had to be employed to analyse the data and interpret the findings in relation to the study's propositions. The criteria for interpreting the findings as they related to each of the four propositions are outlined in Table 3.8. The methods of analysis used are described in Sections 3.2.11.1 – 3.2.11.4.

Table 3.8.

Criteria for Interpreting the Findings

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Proposition 1 **Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School**	The perceived autonomy subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the p<0.5 level)* with perceived intrinsic motivation	Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about the activities they engage in at Forest School and choices about how they execute activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School	Pattern-matching: Interview responses that link opportunities to make choices about the activities a child engages in and choices about how they execute those activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School
Proposition 2 **Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School**	The perceived competence subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the p<0.5 level)* with perceived intrinsic motivation	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement or enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School

Proposition 3 **Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School**	The perceived relatedness subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the p<0.5 level)* with perceived intrinsic motivation.	Pattern-matching: Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through working and playing together with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to developing relationships at Forest School	Pattern-matching: Interview responses that link opportunities the children have had to develop relationships with peers and leaders through working and playing with others with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to developing relationships at Forest School
Proposition 4 **There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School**	The mean score on the Connection to Nature Index will be above 4, with all participants scoring above 3.00, indicating children's connection to nature in line with previous research conducted with children (Bragg, Wood, Barton, & Pretty, 2013)	Pattern-matching: Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment	Pattern-matching: Interview responses that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment

3.2.12 Data analysis.

The following section outlines the researcher's approach to analysing the individual data sources within and across cases.

3.2.12.1 Observations.

Field notes were recorded by the researcher via a researcher journal during each observation. After each observation session, the researcher compared the field notes to the six principles of FS (see Appendix T). In line with a constructivist paradigm the researcher also reflected on each session in a research diary (Mertens, 2015). A sample excerpt from the diary is included in Appendix U.

3.2.12.2 Scale measures.

Data from the scale measures were input to SPSS v.26. The correlation between each subscale score and the two-item brief measure of intrinsic motivation are reported in relation to the relevant propositions, with positive correlations associated with need satisfaction.

The Connection to Nature index (CNI; Cheng & Monroe, 2012) gives a value of between 1 and 5 for connection to nature with a score of 1 representing 'not very connected' and 5 being 'very connected to nature'. In line with previous research with children participants who scored 3 and below were categorised as 'not connected' and who scored above 3 categorised as 'connected' (Bragg et al., 2013). Mean connection to nature scores are reported for each case.

3.2.12.3 Pattern matching.

Pattern matching logic compares an empirically based pattern with a predicted pattern (Trochim, 1989 cited in Yin, 2009). In this case, pattern matching was used to link the predicted pattern, delineated in the four case propositions, with the observed pattern. Pattern matching logic was applied to the child conversations and each participant's interview transcript, as outlined by Yin (2009). The pattern matching codes are outlined in Appendix V.

3.2.12.4 Thematic analysis.

The transcripts from the child conversations and parent and teacher semi-structured interviews were analysed using thematic analysis (TA), following Braun and Clarke's (2006) six phase approach. Data were initially analysed using a theoretical or

deductive approach based on the research questions. An inductive thematic approach was then used to search for additional themes in the data. The phases of thematic analysis (Braun & Clarke, 2006) are outlined in Table 3.9 and the TA process is outlined in greater detail in Appendix W.

Table 3.9.

Stages of Thematic Analysis

Phase	Description of the process
Familiarising yourself with your data	This phase involved transcribing the data, reading and re-reading the data and noting down initial ideas.
Generating initial codes	This phase involved coding interesting features of the data in a systematic fashion across the entire data set and collating data relevant to each code.
Searching for themes	This phase involved collating codes into potential themes and gathering all data relevant to each potential theme.
Reviewing themes	This phase involved checking if the themes worked in relation to the coded extracts (Level 1) and the entire data set (Level 2). A second coder was employed to ensure that the named themes accurately reflected the data. This phase concluded by generating a thematic 'map' of the analysis.
Defining and naming themes	This phase involved an ongoing analysis to refine the specifics of each theme. Themes were named and sub-themes identified where appropriate.
Producing the report	This phase was the final opportunity for analysis. It involved the selection of extract examples and final analysis of these extracts. Furthermore, it involved relating the analysis back to the research questions and literature in the Results and Discussion sections.

At Phase 1 the interviews were listened to and transcribed verbatim by the researcher, which provided the opportunity for immersion in the data. The researcher referred back to notes taken in the researcher's diary after each interview, a means of improving rigour (Vaismoradi, Turunen, & Bondas, 2013). Each transcript was read

multiple times for accuracy and to explore the data. Children's drawings were copied and appended to the relevant transcript. The researcher made notes during this phase, used to inform initial coding in subsequent phases.

At Phase 2, the data were approached with the theoretical propositions in mind. Thematic analysis was used to identify, analyse, and report patterns related to the study's propositions as a means of answering the research questions. Data were coded as individual lines and as small sections of meaningful text. Data relevant to each code were collated using the data management software, NVIVO 12. An overview of the initial and revised coding can be found in Appendix W. During Phase 3, the revised codes were categorised into potential themes. A theme "captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set" (Braun & Clarke, 2006, p. 82). To ensure that the data extracts corresponded with the coded themes, an independent coder (fellow TEP who was familiar with TA) reviewed the themes at Phase 4. This acted as a means of ensuring internal reliability within the analysis process. The researcher briefed the second coder on the established method of coding data. As the deductive analysis was related to the research questions, the coder was given the research questions and study propositions to accompany the transcript. The main aim was to ensure that the themes identified by the researcher reflected the data appropriately. Inconsistencies between the researcher and second coder were identified and consensus was achieved via discussion, in line with previous research (K. Bradley & Male, 2017). A thematic map of potential themes was then created.

At Phase 5 the extracts within each theme were re-read to ensure that themes were "internally coherent, consistent and distinctive" (Braun & Clarke, 2006, p. 96). It was considered if themes contained sub-themes. The interview recordings were listened to again and transcripts were re-read in relation to the thematic map. Themes and sub-themes were renamed or reorganised where necessary. During the final phase, themes that related to case propositions were documented under the corresponding proposition in the case report (Section 3.3) and discussed in relation to the propositions (Section 3.4).

3.3 Results

3.3.1 Overview.

The case report, encompassing the findings of both cases, is presented in this section. The case report addresses each of the three research questions in turn. A case description was constructed to outline the school context for each case and is included in Appendix E. Data related to the FS sessions across both cases are compared against the principles of FS to answer RQ1 'What is happening during Forest School sessions?'. This is followed by findings related to the case propositions. Findings for Propositions 1 – 3 address RQ2 'Can children's experiences of Forest School be explained by self-determination theory?' and findings for Proposition 4 address RQ3 'Can children's experiences of Forest School be explained by nature connectedness?'.

3.3.2 RQ1: What is happening during Forest School sessions?

This section compares the three FS sessions observed by the researcher in each case, along with interview data from the FS leaders, against five principles of FS (IFSA, n.d.). The sixth principle, relating to the qualifications of the leaders, was addressed through the case selection protocol (Section 3.2.7.1). The researcher recorded field notes during observations of FS practice in both cases. The researcher's field notes were compared against the five principles following each observation (see Appendix T) and reflections on each session recorded in a research diary (see Appendix U for a sample). A key quote from FS leaders' interviews and relevant excerpts from the researcher's diary are also used to elucidate the five principles.

3.3.2.1 Forest School sessions in Case 1.

Findings related to the five principles for Case 1 are outlined in Figures 3.3 – 3.7, followed by a summary.

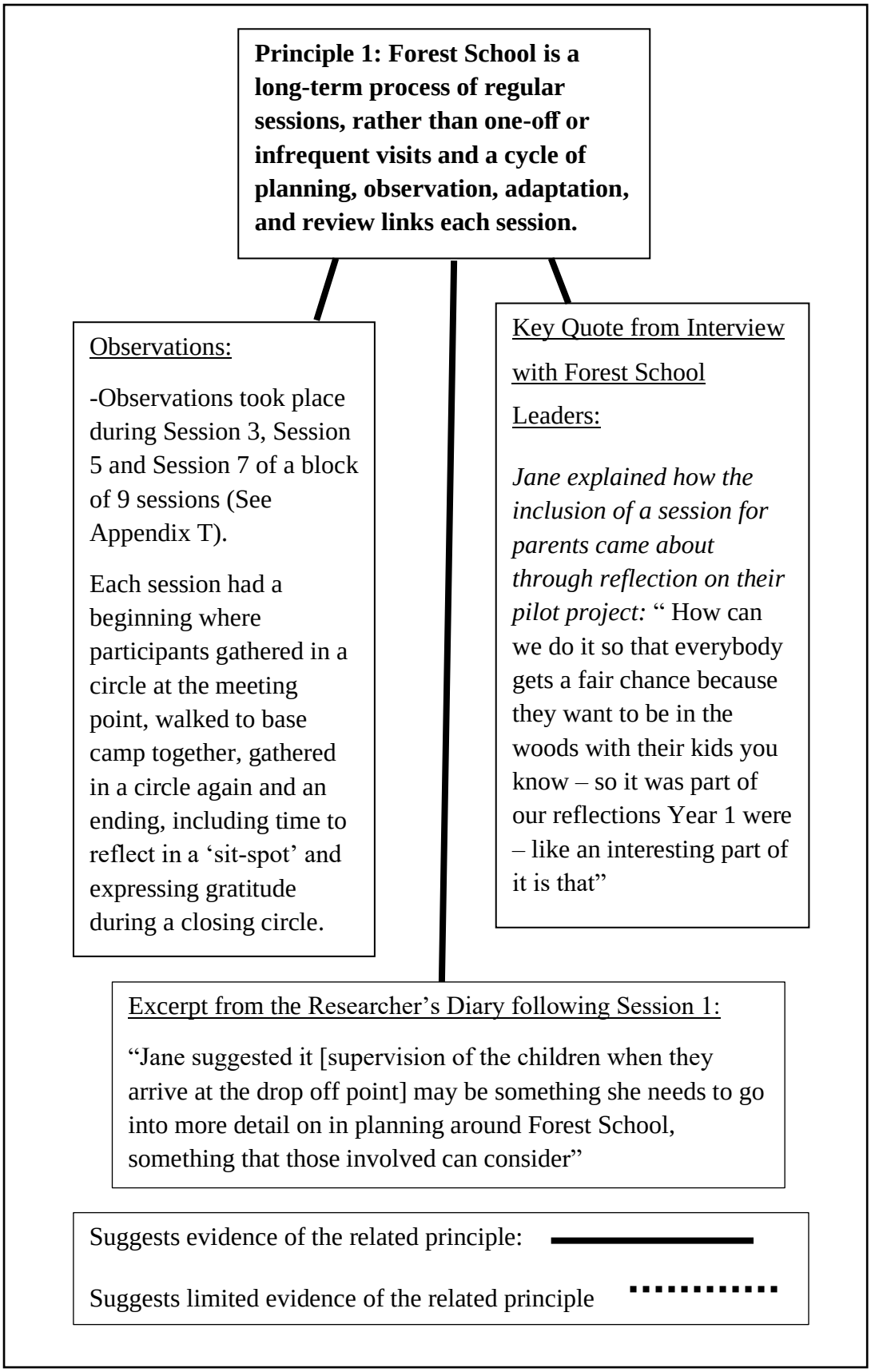

Figure 3.3. Case 1 Principle 1.

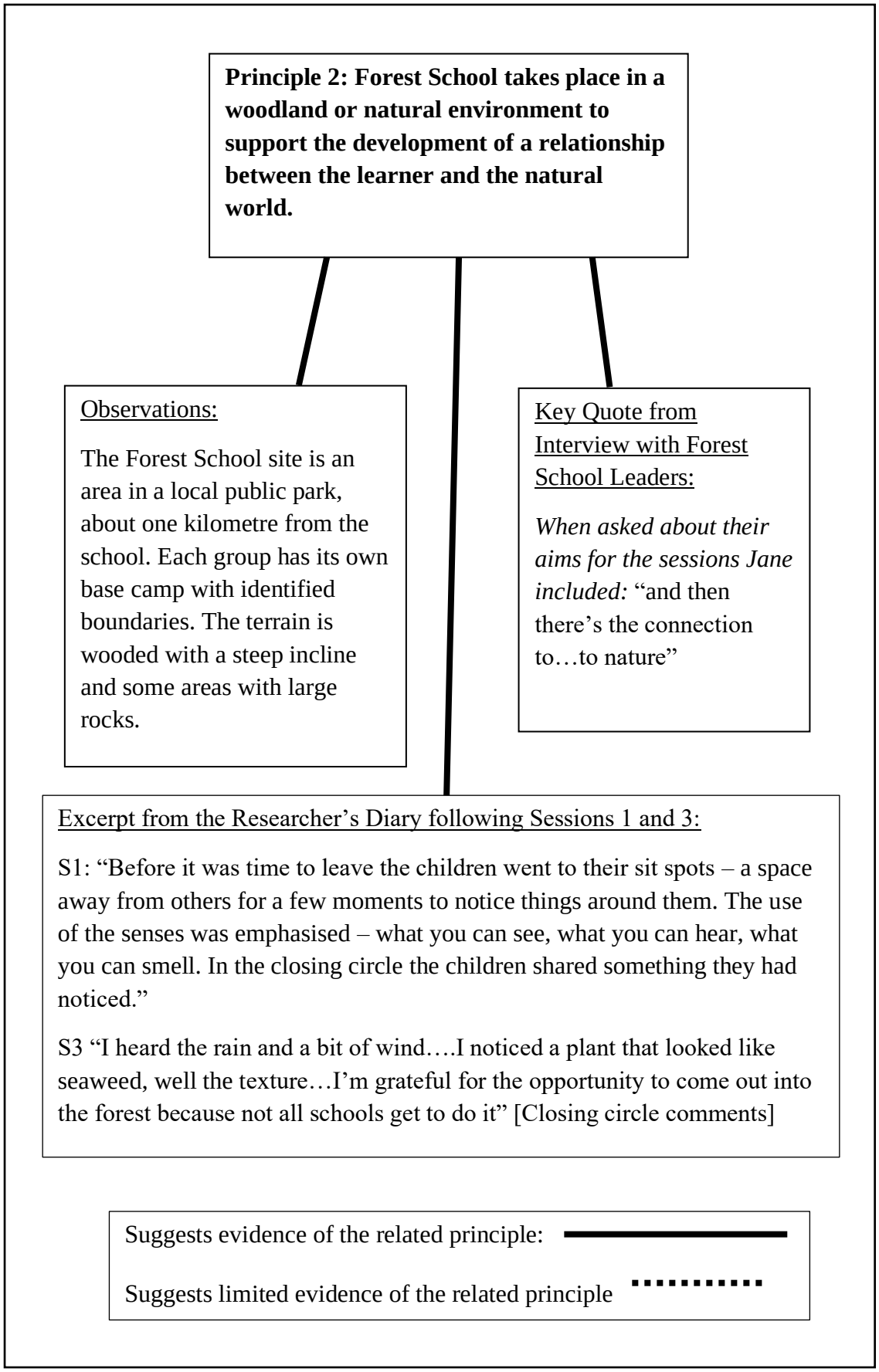

Figure 3.4. Case 1 Principle 2.

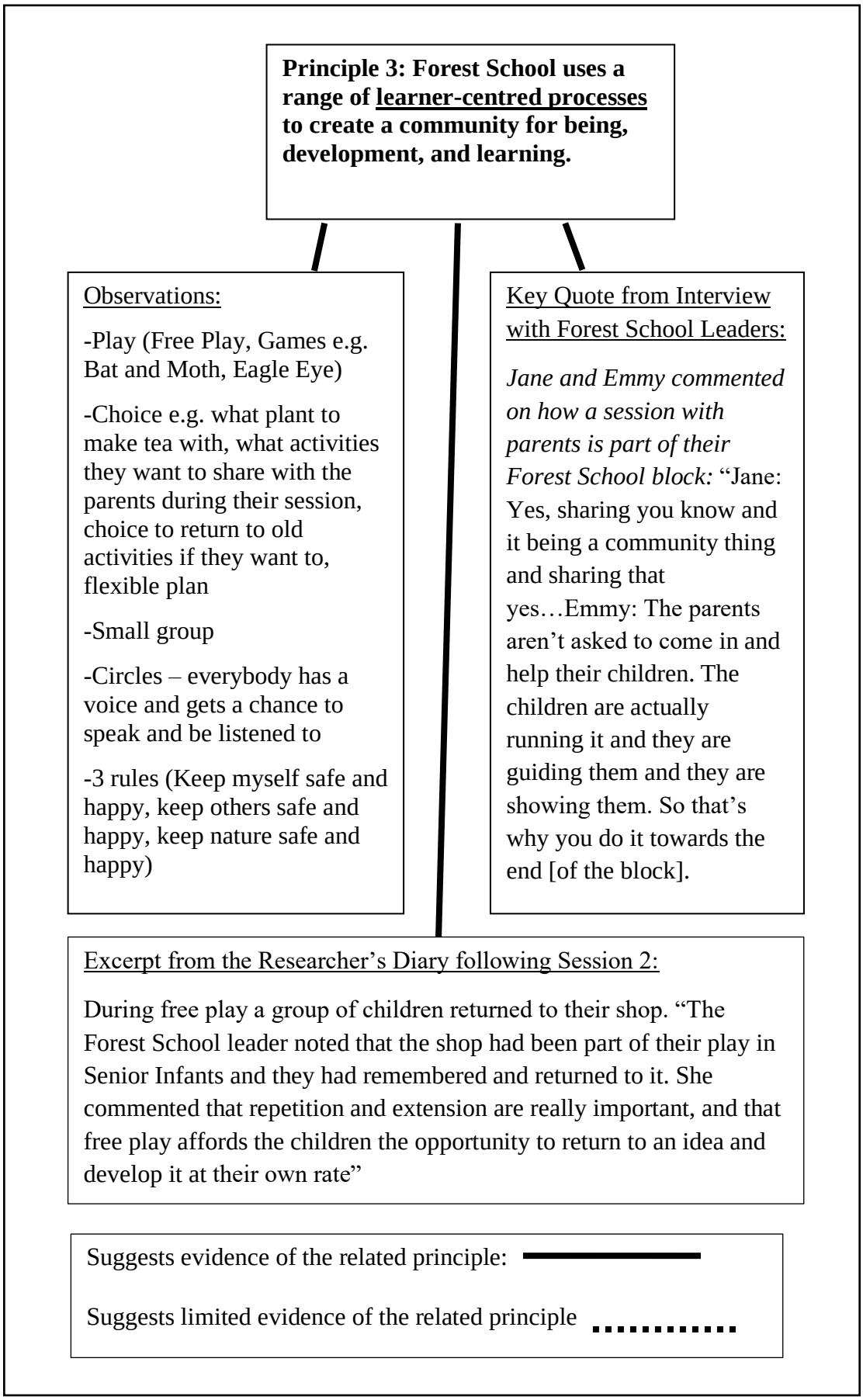

Figure 3.5. Case 1 Principle 3.

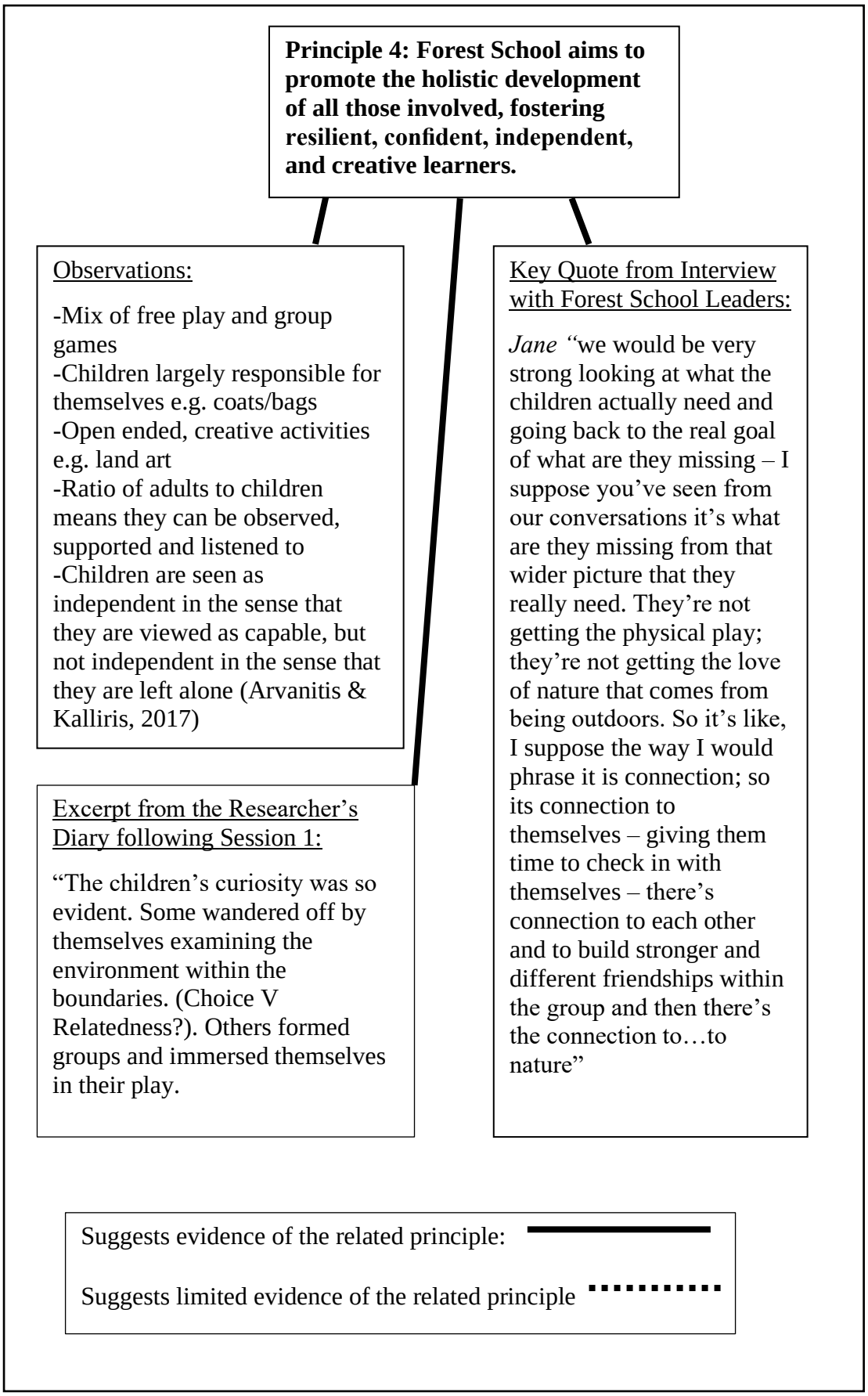

Figure 3.6. Case 1 Principle 4.

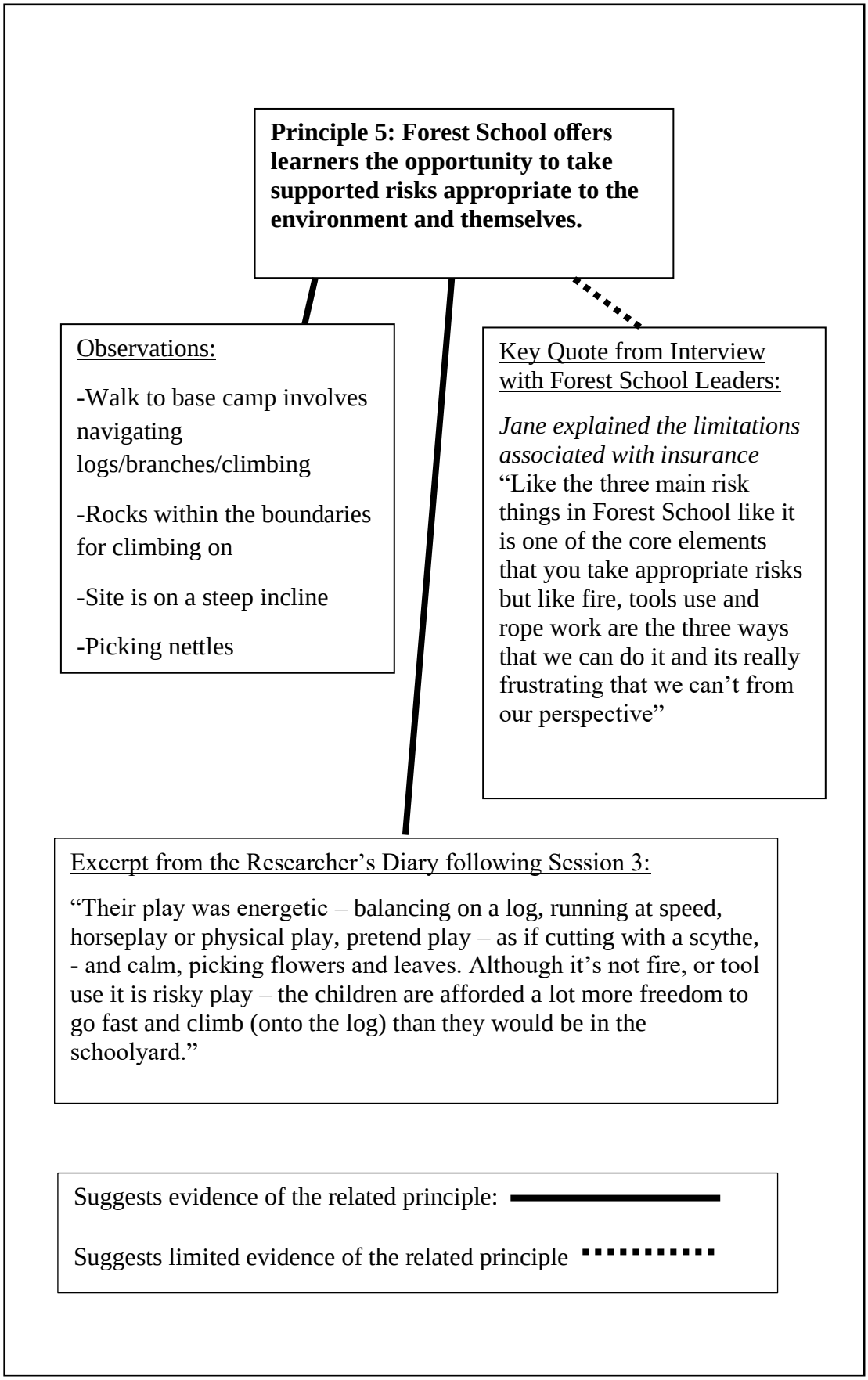

Figure 3.7. Case 1 Principle 5.

3.3.2.2 Summary of Forest School sessions in Case 1.

Participants engaged in regular sessions, with nine sessions in this block (Principle 1, Figure 3.3). The sessions took place in a local woodland site, and the leaders planned activities to support the development of a connection with nature (Principle 2, Figure 3.4). Play, choice, and small groups, with a ratio of ten children to two adults, were examples of 'learner-directed processes' in Case 1 sessions (Principle 3, Figure 3.5). One of the nine sessions was opened up to the parents "sharing you know and it being a community thing and sharing that", with the children "running it and they are guiding them" (Principle 3, Figure 3.5). In relation to principle 4 (Figure 3.6) Jane, one of the leaders, associated holistic development with "connection - so it's connection to themselves – giving them time to check in with themselves – there's connection to each other and to build stronger and different friendships and then there's the connection to…to nature". Opportunities to take risks (Principle 5, Figure 3.7) were associated with risky play e.g. running at speed and climbing at height. However, Jane explained that "fire, tool use, and rope work" are not covered under their insurance and therefore the children did not experience these risks.

3.3.2.3 Forest School sessions in Case 2.

Similar to Case 1, this section compares the three FS sessions observed by the researcher in Case 2, along with interview data from the FS leader, against five principles of FS (IFSA, n.d.). Findings related to the five principles for Case 2 are outlined in Figures 3.8 – 3.12.

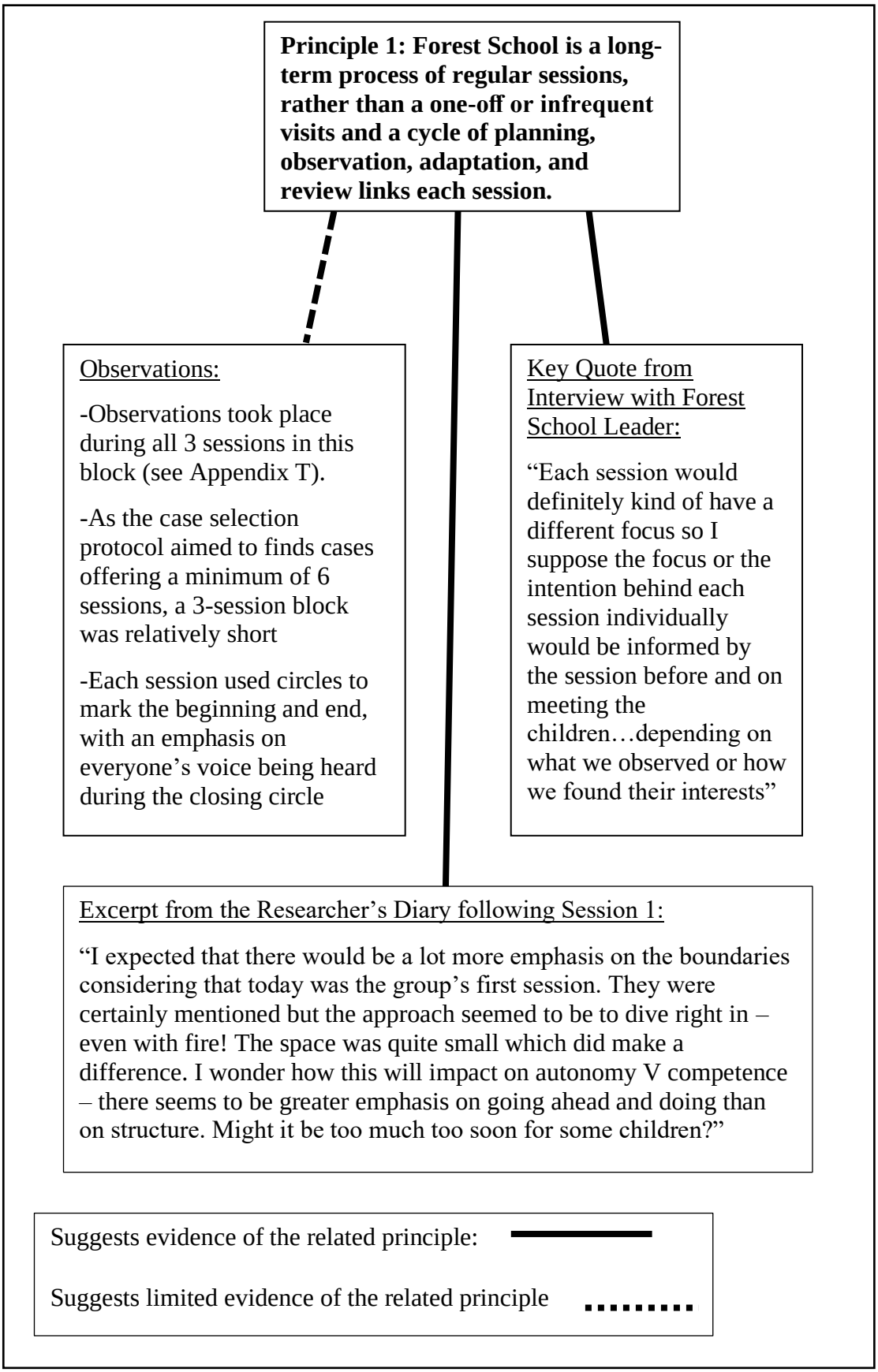

Figure 3.8. Case 2 Principle 1.

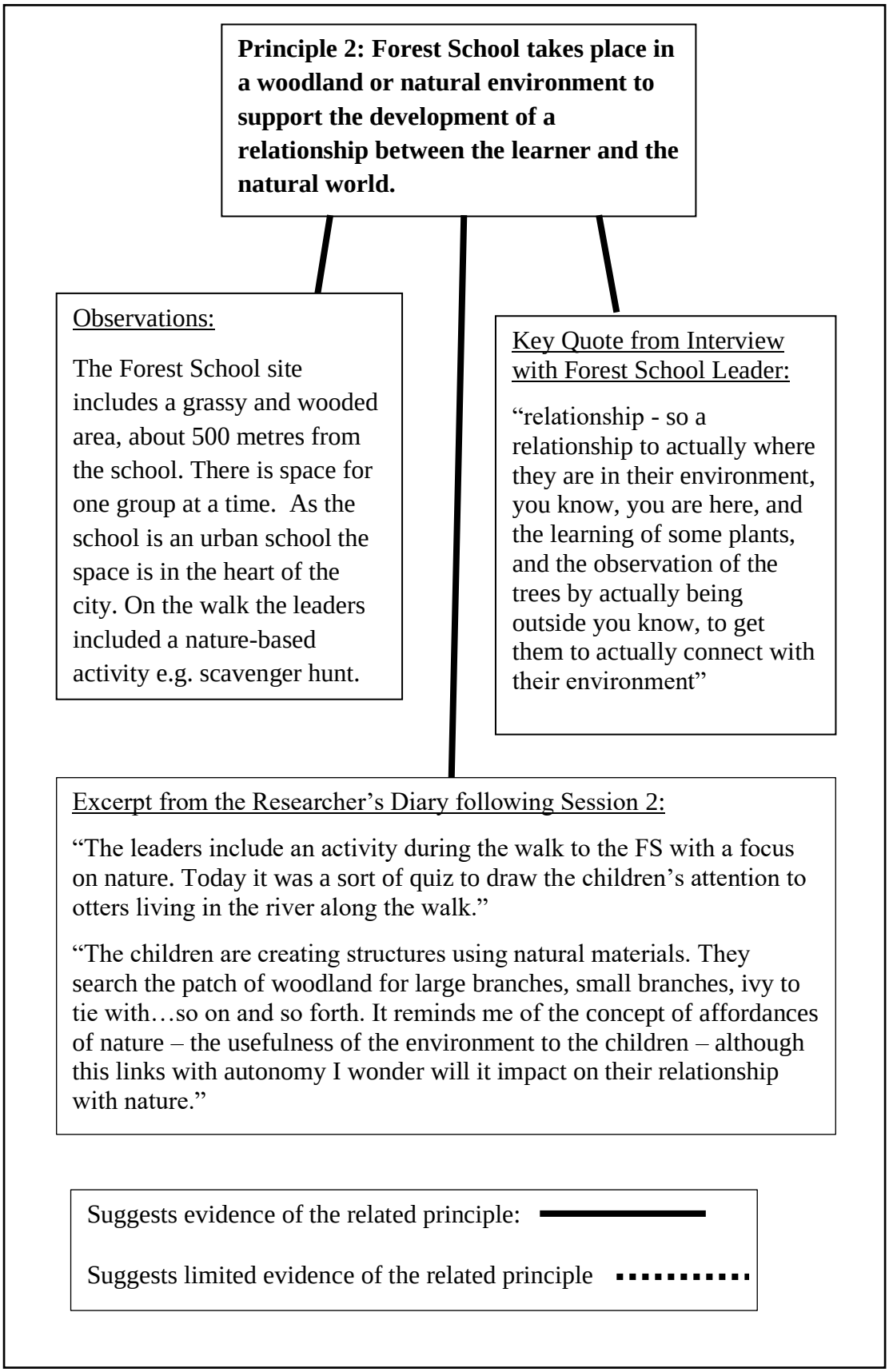

Figure 3.9. Case 2 Principle 2.

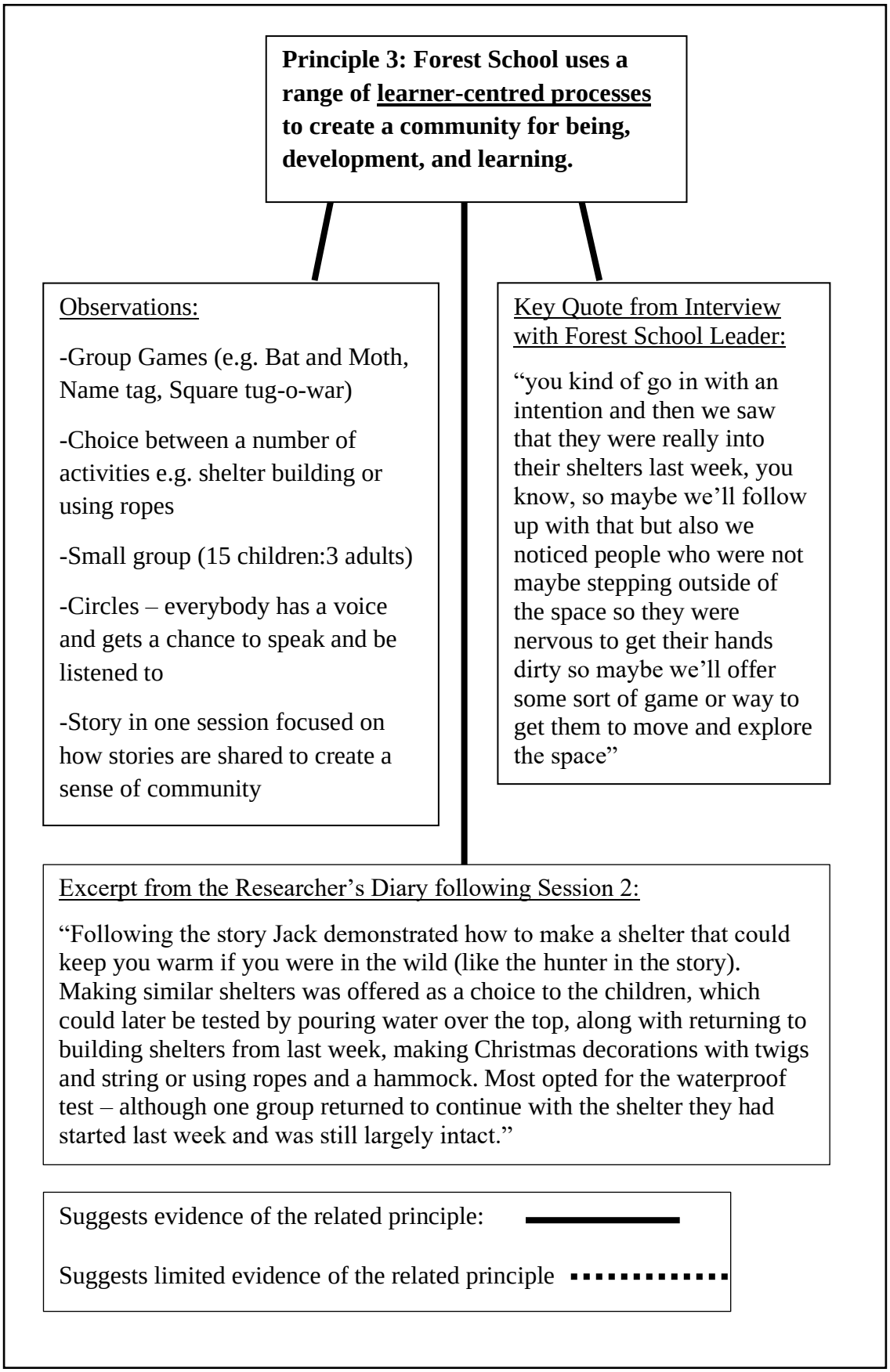

Figure 3.10. Case 2 Principle 3.

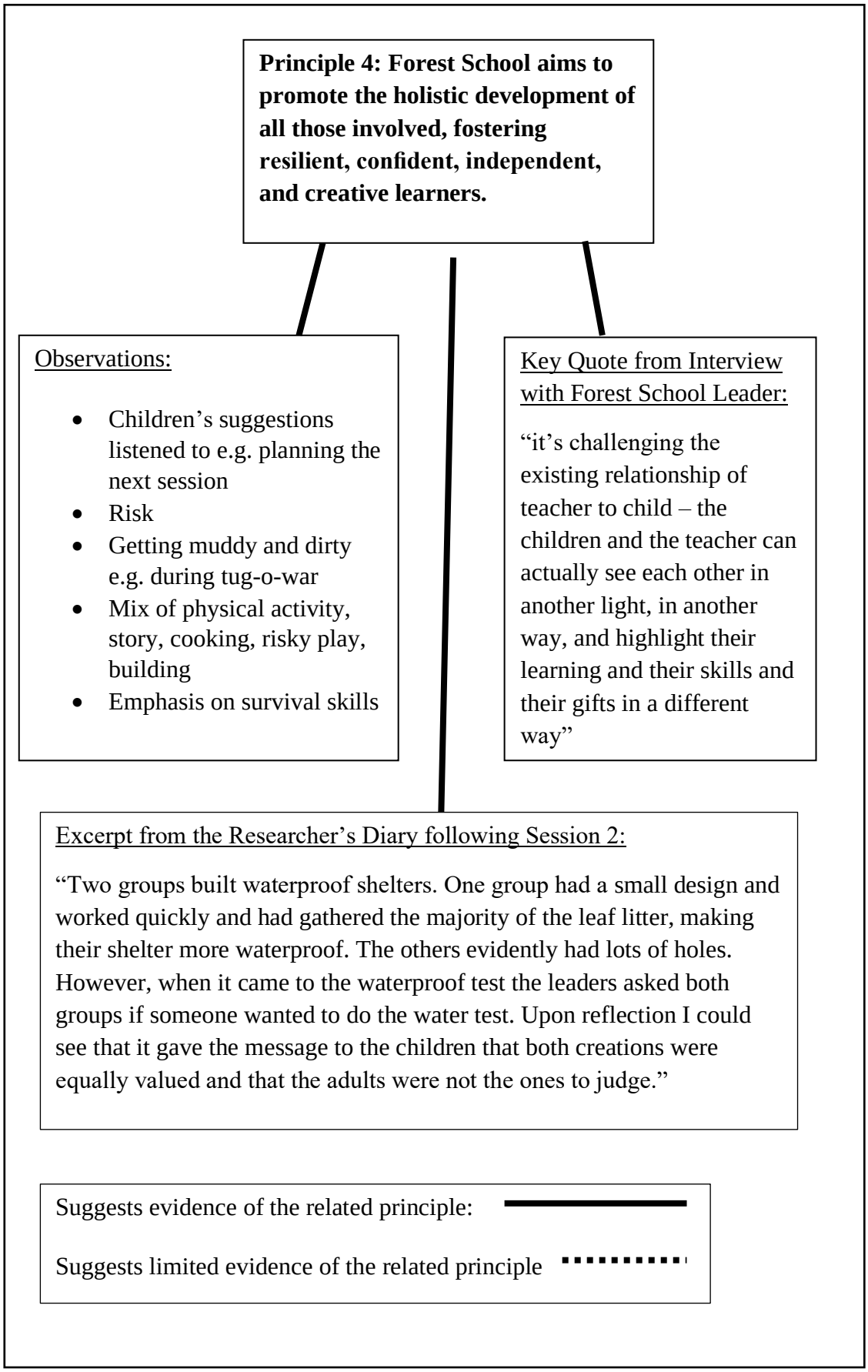

Figure 3.11. Case 2 Principle 4.

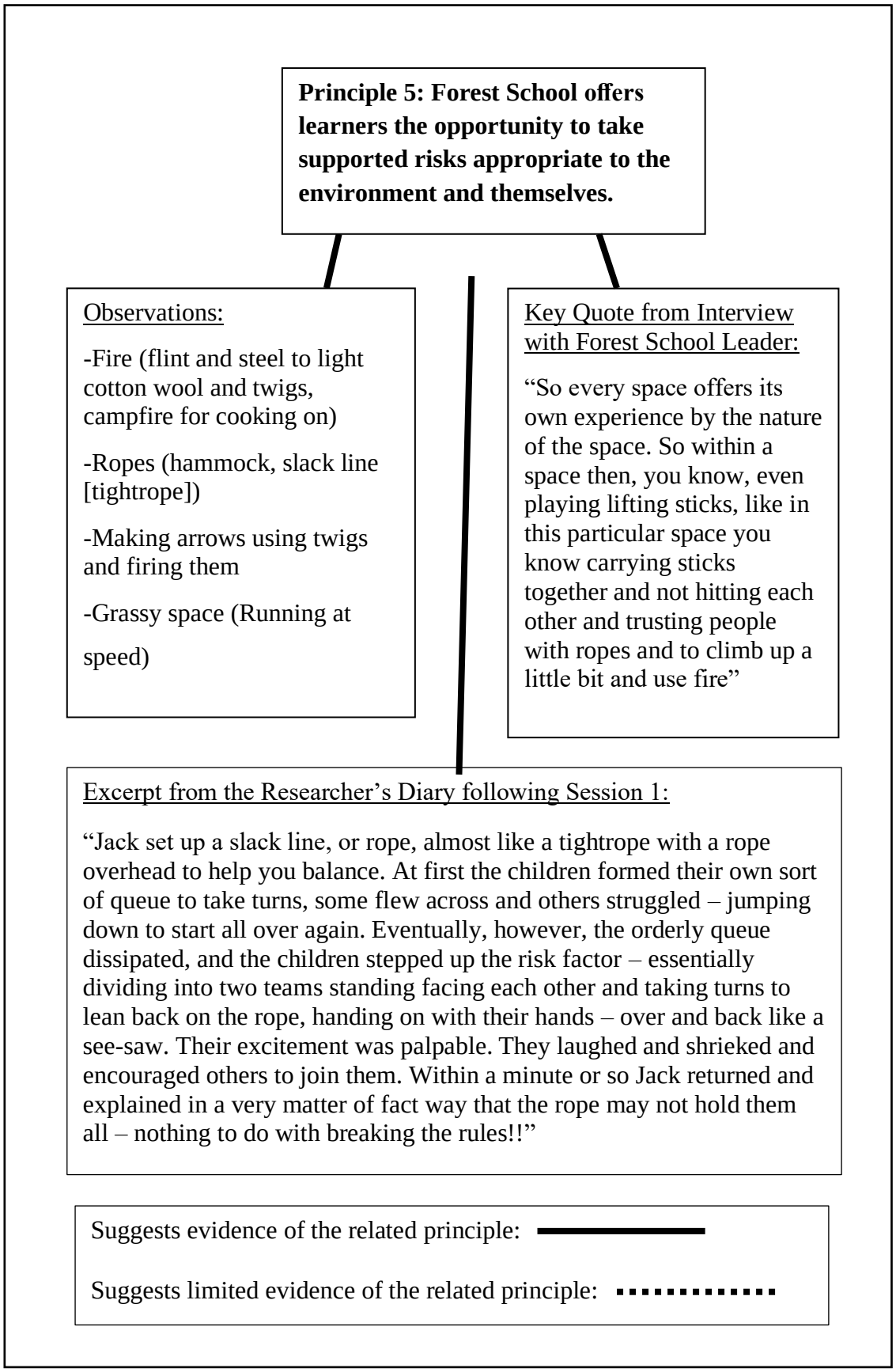

Figure 3.12. Case 2 Principle 5.

3.3.2.4 Summary of Forest School sessions in Case 2.

Participants in Case 2 engaged in a limited number of sessions, with three sessions in this block (Principle 1, Figure 3.8). However, each session had a regular pattern, with opening games and a closing circle, and the leaders reflected on the sessions to influence their planning. The sessions took place in a local woodland site and the children used natural materials to build structures during all three sessions (Principle 2, Figure 3.9). In terms of learner-centred processes, leaders actively elicited the children's voices and asked for their suggestions during Case 2 sessions (Principle 3, Figure 3.10). The FS leader commented on the role of observation in getting a sense of the children's interests and how they adjusted sessions accordingly. In relation to Principle 4 (Figure 3.11), the leader commented on how the holistic nature of learning at FS can create a space where children are seen from a different perspective. Opportunities to take risks (Principle 5, Figure 3.12) were evidenced across all three sessions, although fire was not re-introduced in session 2. During her interview, Eve commented that this needed to be taken more 'slowly', demonstrating the importance of boundaries where risk is involved. Over the course of the three sessions, children had opportunities to light fires, carry sticks and use ropes to climb on.

3.3.3 RQ2: Can children's experiences be explained by self-determination theory?

The proceeding sections present the findings for Propositions 1- 3, exploring the basic needs of autonomy, competence, and relatedness in FS. Appendices X-CC document detailed analyses of each proposition.

3.3.3.1 Propositions related to self-determination theory.

The propositions derived from SDT are outlined in Table 3.10.

Table 3.10.

Propositions related to self-determination theory.

Basic Psychological Need	Proposition
Autonomy	1. Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School.
Competence	2. Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School.
Relatedness	3. Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School.

3.3.3.2 Scale data.

The relationship between perceived autonomy, competence, and relatedness (as measured by the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. Descriptive statistics are included in Table 3.11. The analyses for Case 1 and Case 2 are presented in Table 3.12.

Table 3.11.

Summary of Descriptive Statistics for the BPNS

	Case 1 (*n*=16)	**Case 2 (*n*= 19)**
	M (SD)	***M (SD)***
Total need satisfaction (21 item scale)	5.90 (0.71)	6.50 (0.37)
Autonomy	5.58 (0.82)	6.33 (0.60)
Competence	5.89 (0.95)	6.54 (0.54)
Relatedness	6.20 (0.76)	6.63 (0.35)
Intrinsic motivation (2-item measure)	6.40 (0.61)	6.21 (0.67)

The Basic Need Satisfaction at Forest School Scale gives a value of between 1 and 7 for overall need satisfaction in this setting. Scores above 4 are interpreted as indicative of perceived need satisfaction. The mean scores for autonomy, competence, relatedness, and total need satisfaction in Case 1 ranged from 5.58 (autonomy) to 6.20 (relatedness), suggesting that the basic needs were satisfied. In Case 2, the mean scores for autonomy, competence, relatedness, and total need satisfaction ranged from 6.33 (autonomy) to 6.63 (relatedness), suggesting that the basic needs were also satisfied in this case.

Table 3.12.

Correlations between Autonomy, Competence, Relatedness, and Intrinsic Motivation

	Intrinsic Motivation (Case 1)	**Intrinsic Motivation (Case 2)**
Autonomy	r = .414	r = .418
Competence	r = .668**	r = .771**
Relatedness	r= .753**	r = .479*

Note. *$p < 0.05$, **$p < 0.01$

As outlined in Table 3.12, there was a strong, positive correlation between the competence and intrinsic motivation variables in Case 1 (*rho* =.668, *n* =16, *p* =.005) and

Case 2 (*rho* =.771, *n* =19, *p* = .000), with high levels of competence associated with higher intrinsic motivation. Similarly, there was a strong, positive correlation between the relatedness and intrinsic motivation variables in Case 1 (*rho* =.753, *n* =16, *p* = .001) and Case 2 (*rho* =.479, *n* =19, *p* = .038), with high levels of relatedness associated with higher intrinsic motivation. There was no significant correlation between autonomy and intrinsic motivation in either case.

3.3.3.3 Pattern-matching logic.

Pattern-matching logic was applied to children, parent and teacher responses to questions exploring opportunities for learning in FS across both cases. Pattern matching was used to establish the extent to which participant experiences were consistent with the predicted theoretical pattern, delineated in the propositions. The predicted and empirical pattern for the three propositions related to SDT are outlined in Table 3.13, with pattern-matching logic applied to illustrative quotes from participant's interview transcripts.

Table 3.13

Pattern Matching Logic Applied to Propositions 1-3

Predicted Pattern	Empirical Pattern	Illustrative Example(s)
Proposition 1 **Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School.**	For the most part, children associated play and creative activities with opportunities to make choices between and within activities. Demonstrations of skill-based activities were perceived as directions as opposed to a choice of activity.	***Kate (Child, C1)*** <u>Kate describing how the rocks in her picture were where the boys set up a shop during free play;</u> *Are the girls involved in the shop or are the girls doing other things?* The girls are all usually doing their things [engagement]. *What sort of things might they be?* Like C4, C5, and Sadie they're making like a small hospital … C6 is usually just writing in her diary and drawing in it and stuff [choice between activities] *So is there a choice then at Forest School either to do things on your own or to do things with other people?* Yeah…and I usually do things on my own [self-direction]. And do you like that? Yeah [enjoyment]. ***Robyn (Child, C2)*** *And I noticed you put the fire and the fort here. Is there a choice about what activities you engaged in or was everybody doing these activities together?* Robyn: I mean like we split up into three groups and then we all did our own version [self-direction] of what we were told to do [lack of choice]. So, like today we were told to make [lack of choice] these tepees. So, we made our own version of the tepees [self-direction] cause like Jack gave a demonstration of how to make it and then we made them on our own. So, like my friend's group made cool ones [engagement] that was like really waterproof.

Proposition 2 **Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School.**	Children associated increased mastery of activities and opportunities to take risks involving fire, ropes, and rough terrain with engagement. Opportunities to take explicit risks were connected with engagement to a greater extent in Case 2.	***Sadie (Child, Case 1)*** <u>When asked about what she might do at Forest School Sadie replied:</u> And sometimes we play eagle eye. *Eagle eye - is that the game where there's someone on the rock and they are looking for other people?* Yeah, *Do you like eagle eye?* Yeah [engagement] mainly because me and my two friends we find the perfect spot [increased mastery] up on the rocks [risk]. ***Finn (Child, Case 2)*** <u>When asked about challenges at Forest School Finn commented:</u> Well I like a challenge like if it was all easy there would be no fun [enjoyment]. *Okay. So, parts of it are challenging?* Yeah. *What would be challenging for you?* Well, like I remember the first time of the flint and steel I was there for ages, like trying to make it spark and then I was able[increased mastery] to get spark and then I was like, yay, I can light a fire[risk/enjoyment].
Proposition 3 **Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School.**	The majority of participant responses connected opportunities to develop relationships with peers through play and teamwork, although some children appeared to find this aspect challenging. Opportunities to develop relationships with leaders featured to a lesser extent.	***Kate (Child, C1)*** <u>Describing the wild tea that she included in her picture:</u> I think like we all agree on a plant we can make tea from and then work together [relationships through teamwork] to pick them and then we put them in [engagement] and let it rest for a while and then when it's lunchtime we pass out the tea. *Is there a lot of working together in Forest School?* Yeah [relationships through teamwork] there is quite a bit.

Rosie (Parent, C1)
And I suppose you know the way in class you are working in pairs, but a lot of the time there will be more group work involved, so it's kind of negotiating that as well for some of the children that might have been a little bit tricky. [Evidence that contradicts the predicted pattern]

James (Teacher, C2)
Would you have seen opportunities for the children to develop relationships with others in the group?
Am, to an extent, yes. I think a big influence on that is the groupings I put them in. Um, so like straight away that's going to affect whatever happens inside there. Um, so it's not hermetically sealed in that sense. I've already done something that's going to impact that a lot. [Evidence that contradicts the predicted pattern] Um, so did I notice anything that stood out in that regard? Um, I thought they built up a good relationship in general with Eve and Jack [relationships with leaders]. Um, I thought they were able to relate to them very well.

3.3.3.4 Thematic analysis.

Eleven participants' interview transcripts were analysed in relation to RQ2 and RQ3. Interviews with adults (n= 7) used a semi-structured interview format. Three teachers and four parents made up this sample. Child conversations (n=4) used a 'Draw, Write and Tell' approach. Data from both children and adults were analysed together using TA to identify and interpret patterns of meaning within the data (V. Clarke & Braun, 2017). These patterns are identified as themes and related subthemes.

Figure 3.13 provides an overview of the key themes and related subthemes in this data. These themes and subthemes are exemplified in key quotes from participants

in Appendices X-CC. The TA process is documented in Appendix W. As a combination of deductive, or theory-driven analysis, and inductive, or data-driven analysis was used, the themes elucidate both the study propositions and other patterns in the data.

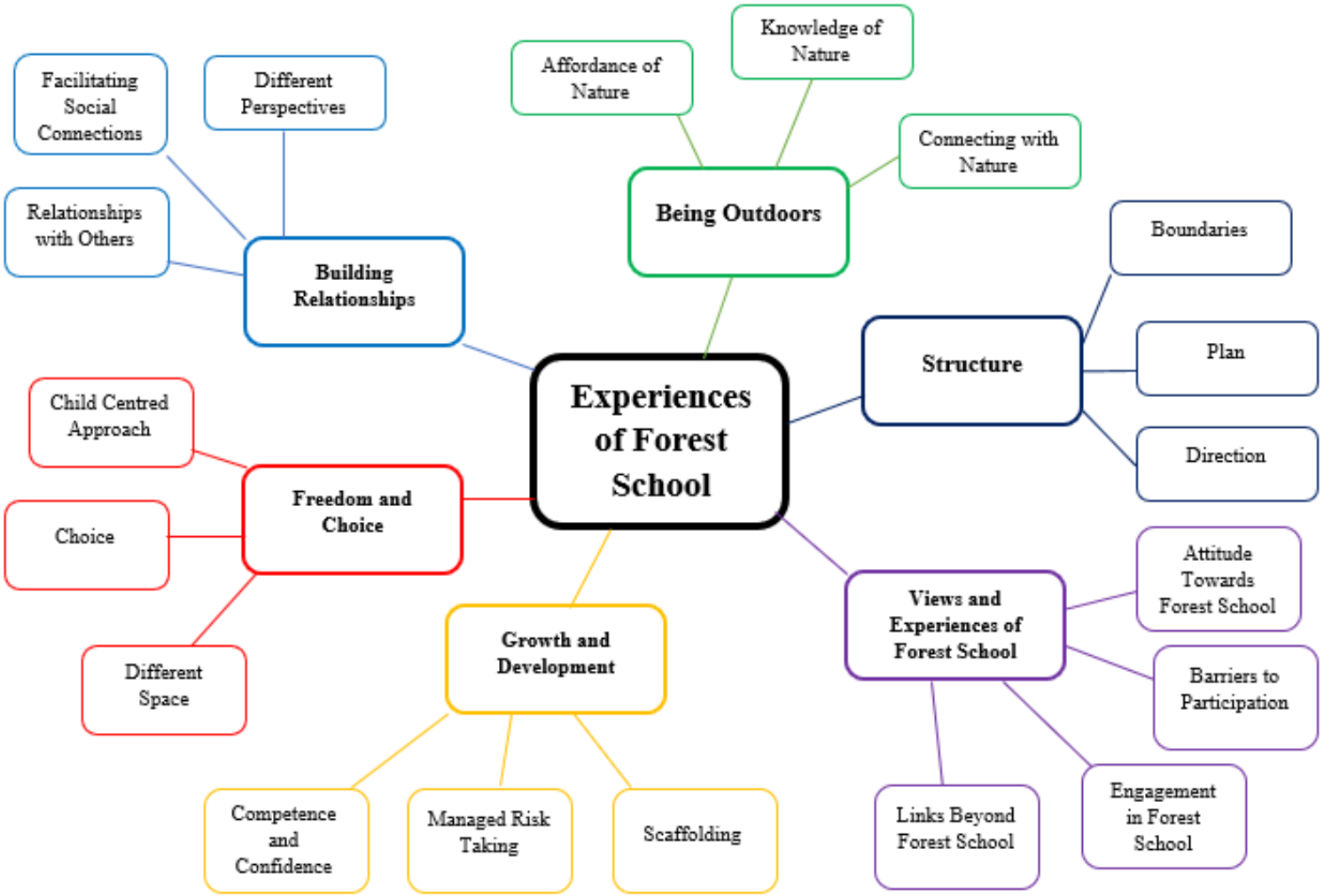

Figure 3.13. Overview of themes and subthemes.

3.3.3.5 P*roposition 1.*

Themes and subthemes to elucidate Proposition 1 are outlined in Figure 3.14 and are discussed in the proceeding sections.

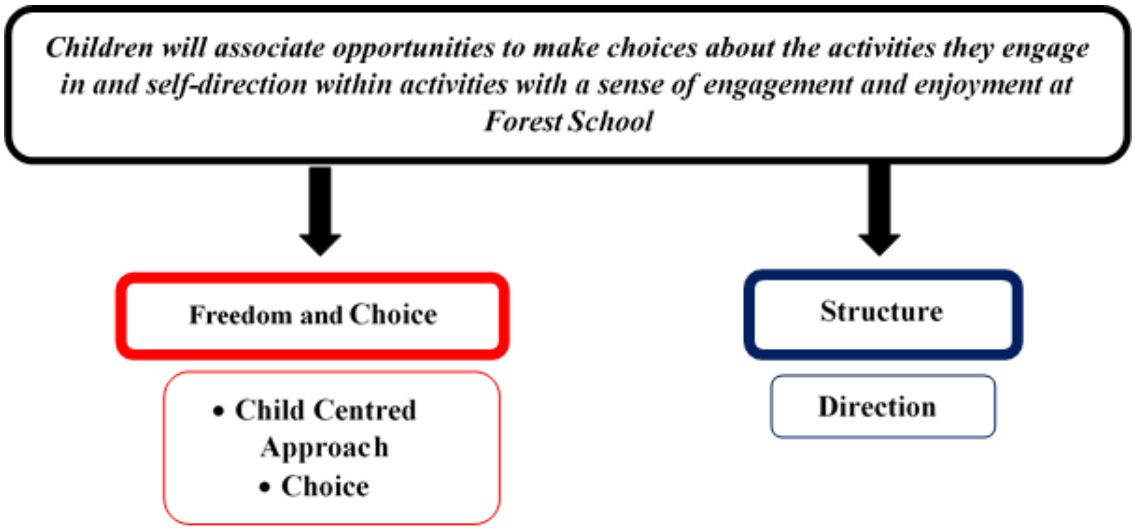

Figure 3.14. Proposition 1 and associated themes and subthemes.

3.3.3.5.1 Child-centred approach.

Pertaining to Proposition 1, the planning and facilitation of sessions gave children opportunities to have an input in the experience. A child-centred approach was associated with examples of following the children's lead and play. The younger children in Case 1 associated free play, *when we can go around the base camp and play with each other* (Sadie, Lines 21-22), with the freedom to explore their own ideas, giving *that added sense of pupil voice* (Tom; Line 78).

Eleanor (parent) compared the autonomy in FS to another outdoor education experience:

> *I mean, when they do it in Scouts it's more, I think it's not as self-directed, you know, it's kind of more they are told what to do whereas with this it seemed to be more led more by the kids themselves.* (Lines 168-170)

Similar to Eleanor, Tom observed *that there is always a plan but when the children, you know, come up with an idea or they take things in a particular direction they are kind of free to do that* (Lines 67-70).

3.3.3.5.2 Choice.

Proposition 1 hypothesised that participants would experience autonomy by having choice between activities and choices within activities rather than a definite outcome or end goal. Sadie (child) commented *we don't do that many group things, we can go and do our own things as well* (Lines 69-70). Kate connected the freedom to choose with interest in FS:

> *I think for me Forest School is a bit more interesting…because I get to be like, I get to like spread out and like do what I want with nature* (Lines 138-142).

Choice between activities was commented on to a greater extent by adults than children:

> *It's great to see what activities they engage with, especially when they had choice over it, and they had a lot of choice* (James; Lines 97-98)

Activities at FS were perceived as open-ended and creative. Tom described how this increased the children's self-direction within activities:

> *… because they have that ownership of it, they are not as anxious about doing the right thing. It is more about the process than it is about the product or the outcome.* (Lines 154-157)

In terms of creativity, he commented that at FS the children '*are coming up with their own ideas'* (Lines 79-80). This was echoed by one of the children, Robyn:

> *I think it's just being able to do your own things with it.* (Lines 97-98)

3.3.3.5.3 Direction

A tension appeared to arise between skills-based activities and perceived autonomy support. The children seemed to interpret activities that the leaders demonstrated as instructions:

> *You have to do a little shelter. And then you put a, you had to make it waterproof, and then you put your head in it and they poured water on the shelter* (Finn, Lines 4-6)

3.3.3.6 Proposition 2.

The themes and subthemes to elucidate Proposition 2 are outlined in Figure 3.15 and are discussed in the proceeding sections.

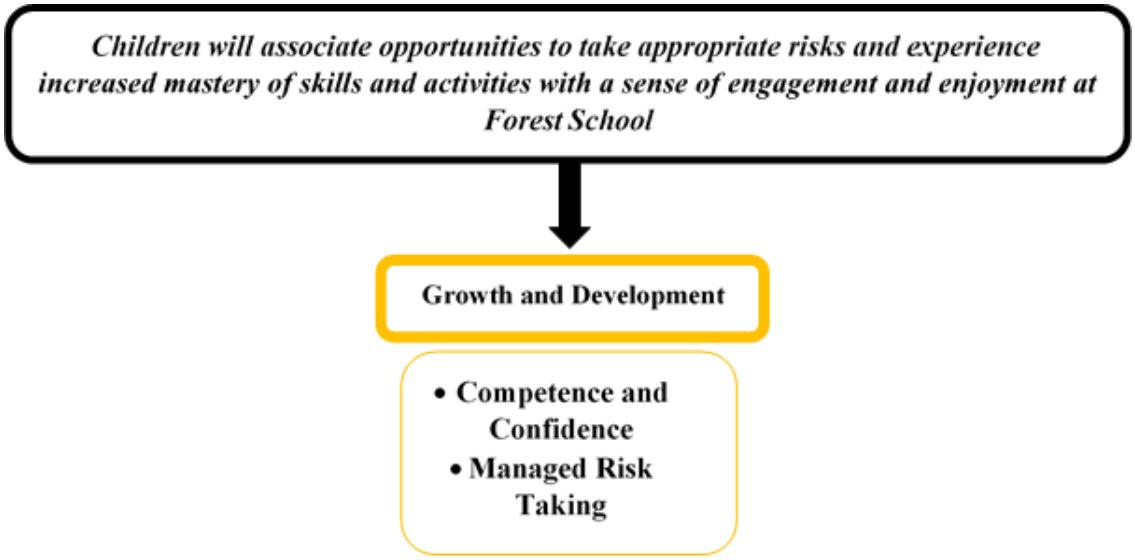

Figure 3.15. Proposition 2 and associated themes and subthemes.

3.3.3.6.1 Managed risk-taking.

Children were given opportunities to take what Tom (SET) described as '*sensible risks'* (Line 123). Although fire, rope, and tool use in Case 1 were limited by insurance, the woodland environment offered other risks:

> *There was another child in the first group who was basically nearly afraid of everything and am you know was afraid to climb on the trees…but by the end of the block there was huge improvements, you know, in just taking risks.* (Rosie, Lines 296-300)

Another parent, Anna, observed how her children would *assess situations (*Line 298*)* and determine *that's a safe area, that's not a safe area* (Lines 83-84), a form of risk assessment.

Fire and rope use increased the level of risk in Case 2. Finn described how the ropes facilitated risky play with the older age group:

> *You'd be standing on the rope underneath and you'd hold on the rope on top and you'd have to try shake each other off* (Lines 66-67)

Robyn described the feelings she associated with taking risks:

It's like getting nervous but then is like a lot of fun, because you're nervous that it might happen, but it's fun to be nervous about it (Lines 33-35)

3.3.3.6.2 Competence and confidence.

Participants described how the environment and activities at FS provided opportunities for the children to experience increased mastery over time. The connection between this sense of competence and confidence was also expressed:

...you can kind of nearly see them growing through the process you know like it can be quite inspiring for the kids to be in that environment where there's such active learning going on and like so many kind of eureka moments when they're asked to do a task or something and they figure out they can do it themselves. (Rosie, Lines 518-522)

3.3.3.7 Proposition 3.

The themes and subthemes to elucidate Proposition 3 are outlined in Figure 3.16 and are discussed in the proceeding sections.

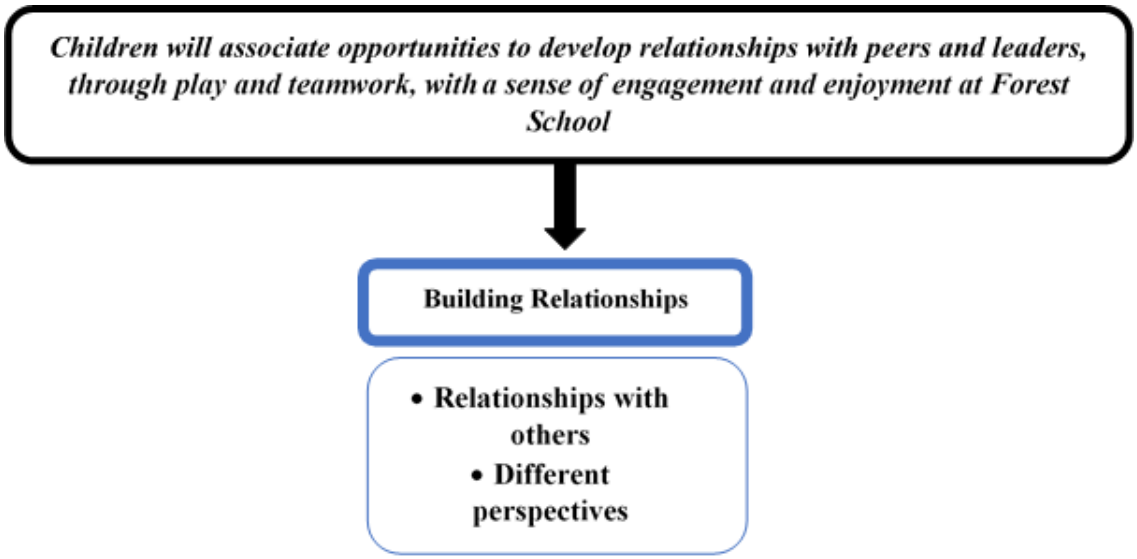

Figure 3.16. Proposition 3 and associated themes and subthemes.

3.3.3.7.1 Relationships with others.

Forest School provided the children with opportunities for '*playing and working as a team'* (Beth, Line 110). Tom (SET) noticed a high level of participation:

When they are asked to work in groups, they just organise it themselves and they all get stuck in (Lines 151-152)

From a parent's perspective, Rosie noted the value of the games during sessions:

> *You know, nowadays children don't really play so much outside on the road or things like that. So, opportunities to build up those friendships I think is great, you know within the class (*Lines 429-432*)*

For the older children, Beth (parent) felt FS '*allows them to speak to each other person to person'* without *it being via technology'* (Lines 188-189).

Kate (child) gave examples of working together with others to achieve a shared goal, '*we all agree on a plant we can make tea from and then work together to pick them'* (Lines 46-47) and also commented that she liked to '*do things on her [my] own'* (Line 133). This suggested that children had the choice to work with others or to have time alone.

The emphasis on teamwork was not easy for all of the children. While Finn (child) described the benefits, including '*different point of views'* (Line 183), Rosie observed that '*negotiating that [group work] as well for some of the children that might have been a little bit tricky'* (Lines 357-358). To this end, she noticed the value of the sit spots in terms of increasing the children's awareness of others' perspectives:

> *They're saying the things they noticed and just to see how they realise they're not the only person and there's a lot of kind of noticing about other people, I think. So, they learn about other people and the relationships between people.* (Lines 539-542).

3.3.3.7.2 Different perspectives.

Both teachers and parents spoke about the new perspectives gained through FS:

> *...you'll hear stories of them sort of seeing their classmates in a different light because of the difference in environment* (Anna; Lines 101-103)

This was considered particularly important for children who may experience challenges in the classroom environment:

> *...they tend to really shine in the outdoors because it is something that am that is kind of not as academically focused* (Tom; Lines 32-34)

Eleanor (parent) exemplified this when she described how FS gave her daughter, who has a specific literacy difficulty, an opportunity to show her strengths:

...her classmates see her in that role as being quite competent you know that's really good for her self-esteem because she, you know, she's doing something she likes (Lines 118-120).

3.3.4 RQ3: Can children's experiences be explained by nature connectedness?

The proceeding sections present the findings for Propositions 4, exploring NC in FS. Appendices DD and EE document detailed analyses of this proposition.

Proposition 4
There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School

3.3.4.1 Scale Data

The Connection to Nature Index (Cheng & Monroe, 2012) gives a value of between 1 and 5 for overall connection to nature. Proportions of participants who are 'not connected' (who scored 3 and below) and who are 'connected' (scored above 3) are reported in Table 3.14. Mean connection to nature scores, along with the standard deviation and range are also reported.

Table 3.14.

Connection to Nature Index Scores

Case	**CNI Mean score**	**Standard Deviation**	**Range**	**% Connected to Nature**
Case 1	4.35	±.43	3.44 – 5	100%
Case 2	4.26	±.55	2.81 – 4.88	94%

The total Connection to Nature scores for children in Case 1 ranged from 3.44 to 5, with all 16 participants falling into the 'connected' category. The mean score was 4.35 ±.43, indicating children reported a high level of connection to nature. The total Connection to Nature scores for children in Case 2 ranged from 2.81 to 4.88, with 18

out of the 19 participants falling into the ‘connected’ category. The mean score was 4.26 ±.55, indicating most children reported a high level of connection to nature.

3.3.4.2 Pattern-matching logic.

Pattern-matching logic was applied to children, parent, and teacher responses to questions exploring opportunities for learning and being outdoors in FS. Table 3.15 details the empirical pattern compared against the predicted one along with pattern-matching logic applied to key quotes from participants' interview transcripts.

Table 3.15.

Pattern-Matching Logic Applied to Proposition 4

Predicted Pattern	Empirical Pattern	Illustrative Example(s)
Proposition 4 **There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School.**	Children associated time outdoors during Forest School with an opportunity to connect with nature. However, there were some examples of aspects of the outdoor environment that not all children enjoyed, including getting dirty and dogs.	***Kate (Child, C1)*** Comparing Forest School to the classroom; I think for me FS is a bit more interesting *And what makes it more interesting?* Because I get to be like I get to like spread out and like do what I want with nature [outdoor environment] and I also like being in the fresh air and I really like being in the forest [enjoyment of nature] ***Robyn (Child, C2)*** *Do you think that Forest School is different to learning in the classroom?* Oh definitely. You don't get to do all the creative things like making a tepee and stuff in the class because there is not enough room obviously and it's like kind of nice [enjoyment of nature] to have fresh air while you're learning [outdoor environment]. ***Rosie (Parent, C1)***

	My particular children loved it [enjoyment of nature] because it reflected their own interests (being outdoors) at home. Now not every child was the same [lack of enjoyment] and some children did find it tricky at the beginning. Some children … you know, who felt that had to be clean all the time. … where they, you know, were really afraid of, you know, stepping in something or something landed on them [outdoor environment] or you know, they were bordering on hysterical (Lines 264 – 271) but by the end of the block, there was huge improvements [enjoyment of nature].

3.3.4.3 Thematic analysis.

Data were analysed in the same way as Propositions 1-3 (see Section 3.3.3.4 for more detail). The theme and subtheme most relevant to Proposition 4 are outlined in Figure 3.17 and are discussed in the proceeding section.

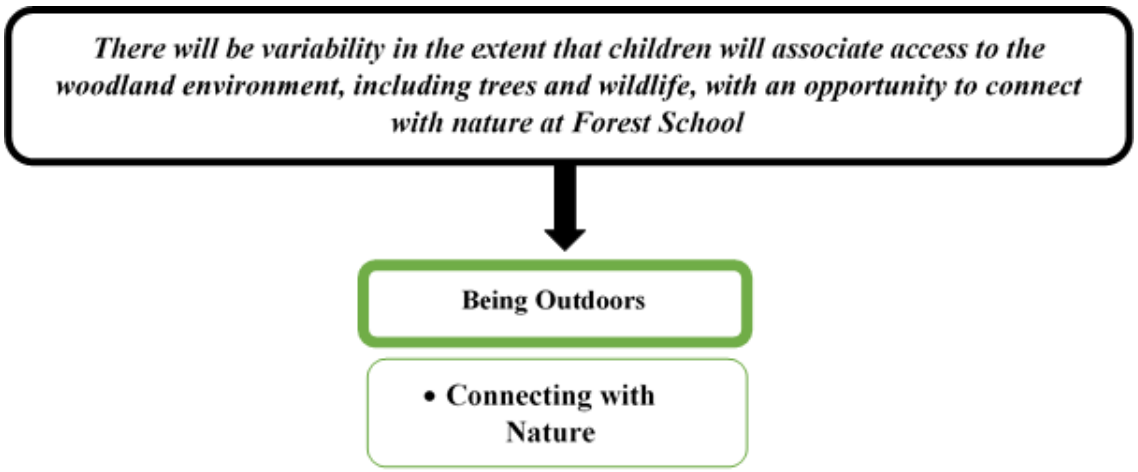

Figure 3.17. Proposition 4 and associated themes and subthemes.

3.3.4.3.1 Connecting with nature.

Access to a natural or woodland environment is one of the key principles of FS, giving children the opportunity to develop a relationship with nature. From her

observations of the children, Lucy commented on those for whom this connection appeared really strong:

> *You see the kids who really, really love nature and really feel connected and who just love being out.* (Lines 41-43).

James, the class teacher in Case 2 commented that it '*was great that we were right in the heart of the city and yet, we could have been much further out',* although he wondered if the children '*found it that way'* (Lines 224-226).

The outdoor environment presented different challenges for different children:

> *You kind of get mucky but you can get over that cause it's like a lot of fun. Some of your friends are really squeamish and they're still like, oh my gosh it's a slug.* (Robyn; Lines 134-137)

Tom felt that a previous experience of FS had helped to stimulate that connection for some children:

> *… they have already done Forest School before so they have developed a really positive relationship with the outdoors and with the environment around them.* (Lines 171-173)

Children, teachers, and parents associated FS with time to notice the world around them and experience a *'multi-sensory benefit'* (Anna; Line 108). Kate recalled an opportunity to taste an edible plant found in the local woodland:

> *There is something I really do like. Like there are these um edible shamrocks that taste sour and I really like sour stuff.* (Lines 167-168)

Kate reflected the skills of noticing and wondering, modelled by the leaders for the children when she described what she was doing in her picture:

> *I'm just um like wondering what type of berries they are and wondering if maybe the robin would eat them…So I was wondering if I stay really still in the picture like in the picture the robin would come and pick one.* (Lines 105-109)

James, in addition to one of the parents, Beth, associated FS with an opportunity to connect with nature amid technology:

> *So, it provides a wonderful balance in that sense where technology is becoming a bigger part of school, but they're not losing that connection with the natural world, so to speak.* (James, Lines 263-266).

Eleanor, another parent, described how she would be '*really in favour'* of more opportunities to engage in outdoor learning at school because '*everybody just benefits from being outdoors and children particularly*' (Lines 65-66). She continued by describing how she '*can see the huge difference in their [her children's] mood*' (Lines 72-73) when they do not get outside during the day. For Eleanor, FS '*validates that [outdoor learning] as a form of learning and also just for primary school children in terms of their mental health and their wellbeing*.' (Lines 75-77)

3.4 Discussion

3.4.1 Overview.

This research project aimed to examine SDT and NC as conceptual frameworks underpinning children's experiences of wellbeing in FS in the Irish primary school context. As outlined in the case report in Section 3.3, it was possible to organise findings in both cases within a SDT framework and NC framework, albeit with some tensions. In the following sections, these findings will be discussed in the context of the literature. Study limitations and implications will also be outlined.

3.4.2 RQ1: What is happening during Forest School sessions?

Empirical research on FS in the Irish primary school context is limited. As the theoretical frameworks that guided the current research project were conceptualised through a review of UK based research it was important to ascertain if practice in the Irish context reflects this existing body of research. As outlined in Section 3.3.2.1 (Case 1) and Section 3.3.2.3 (Case 2), the sessions observed by the researcher were largely reflective of the Irish Forest School Association principles (IFSA, n.d.). Sessions took place in a woodland environment with qualified practitioners. All sessions included play, from open-ended free play to risky play to creative and imaginative play-based activities. In terms of regular sessions, participants in Case 2 attended fewer sessions than in the studies included in the systematic review, attending three half-day sessions compared to a minimum of six half-day sessions (Coates & Pimlott-Wilson, 2019). Risk-taking reflected the continuum described in previous research (Harris, 2017), with the younger children in Case 1 engaging in risky play such as climbing on rough terrain while the older children in Case 2 used fire and ropes.

3.4.3 RQ2: Can children's experiences be explained by self-determination theory?

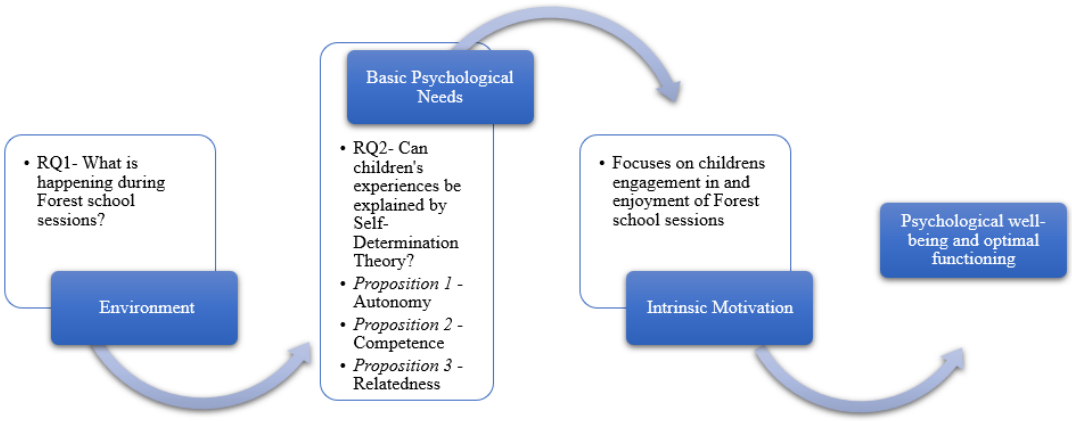

Figure 3.18. Self-Determination Theory as a Conceptual Framework. Adapted from Deci and Ryan (2000).

The theoretical propositions in this study explored autonomy, competence, and relatedness separately. Taking SDT as a conceptual framework, Figure 3.18 demonstrates how a context must be largely supportive of all three needs for wellbeing to occur (Deci and Ryan, 2000).

3.4.3.1 Autonomy

From a SDT perspective, autonomy does not need to be synonymous with total independence. Freedom to make meaningful choices is sufficient for a person to feel autonomous (Arvanitis & Kalliris, 2017). To this end, Proposition 1 hypothesised that children would associate choices between activities and self-direction within activities with a sense of intrinsic motivation at FS.

The 'perceived autonomy' subscale of the Basic Need Satisfaction Scale and the 2-item measure of intrinsic motivation were not significantly correlated in Case 1 or Case 2. Participants' mean scores on the individual scales did, however, indicate high levels of autonomy and intrinsic motivation. Pattern-matching logic was applied to participants' interview responses in both cases. Patterns within their responses associated opportunities to make choices with play-based activities and creative activities, where the activities were open-ended, and the leaders plan responsive to the children's interests.

Themes, subthemes, and associated codes connected with autonomy are delineated in Figure 3.19.

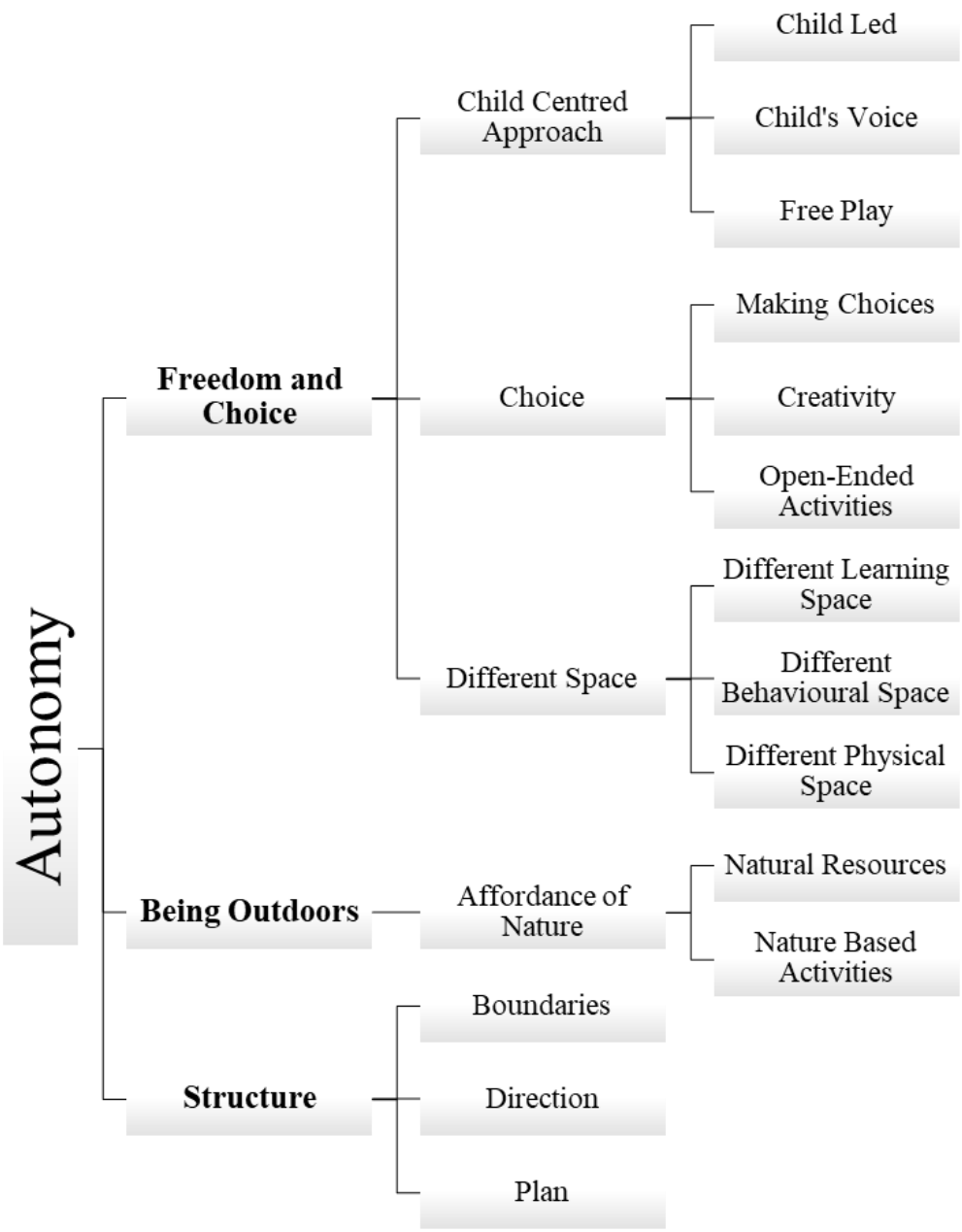

Figure 3.19. Autonomy: Themes and Subthemes.

3.4.3.1.1 Play and choice.

Play is central to FS pedagogy (Coates & Pimlott-Wilson, 2019; Ridgers et al., 2012; Waite & Goodenough, 2018). From a child's perspective, an activity is perceived as play, as opposed to work, based on the level of choice they perceive themselves to have (McInnes, Howard, Miles, & Crowley, 2009). It was not surprising, therefore, that opportunities to play were associated with choice and a child-led approach across both cases, and closely linked to participants' feelings of autonomy. Children had

opportunities to engage in play-based activities, with some adult direction, and in free play, consistent with previous research in similar settings (Ridgers et al., 2012).

In Case 1, FS sessions included explicit time for free play, alongside more structured activities, including creative activities and foraging. During some observations (see Appendix T) it was noted that the children's desire to continue with their play preceded the leader's plan, amplifying the child-led approach. Children associated free play with the freedom to choose what to play "The girls are all usually doing their things" (Kate, Case 1, Line 124) and with whom: "It's when we can go around the base camp and play with each other." (Sadie, Case 1, Lines 21-22).

In Case 2 the children were regularly presented with choices between activities, such as shelter building and using ropes. The progression to activities that include skill development with older children reflects previous research (Harris, 2017). In Case 2, the leaders demonstrated explicit skills needed for specific tasks. In her interview it emerged that Robyn, one of the children, interpreted these demonstrations as directive: "then we all did our own version of what we were told to do" (Lines 65-66). Interactions that are perceived as pressure to behave in a certain way are controlling as opposed to autonomy supportive (Reeve, 2009). Despite the perceived lack of choice between activities, the open-ended nature of the activity appeared to satisfy the need for autonomy by encouraging self-direction: "…you got to like choose what you want to do with it" (Robyn, Line 93). This resonates with research that suggests that directing the course of events during an activity can be sufficient for children to perceive the activity as play (N. R. King, 1979).

The links between play and autonomy in this research project provide greater insight into play pedagogy in FS. Play in these FS sessions fell on a continuum from structured play through to more free play, consistent with previous research on play from a self-determination theory perspective (P. King & Howard, 2016). National policy on play defines play as "freely chosen, personally directed, intrinsically motivated behaviour that actively engages the child" (National Children's Office, 2004, p. 11). The findings of this study suggest that even 'free play' was not free in the purest sense, structured entirely by the children themselves (P. Gray, 2011). There were inherent limitations, including the boundaries of the base camp and the availability of resources. The findings resonate with P. King and Howard's research on the actualities of free play in education settings, acknowledging that factors such as "the environment,

the time, and the resources available" (2016, p. 64) have an impact. Despite these challenges, the findings present evidence of active engagement in play across both cases.

3.4.3.1.2 Autonomy supportive communication.

Autonomy supportive communication emerged in participant responses across both cases. This enabled the adults to attune to the children's needs. From his observation of the sessions, Tom (SET) commented that because "you have smaller groups you get to hear the children a lot more and you get to really tap into what their interests are, what their strengths are and really accelerate those" (Lines 81-83). The leaders actively encouraged the use of 'I wonder' statements as a way of communicating something they observed, a language pattern associated with increasing children's agency and offering meaningful choices (Houen, Danby, Farrell, & Thorpe, 2016). In Case 2, the leaders were described as "doing a lot of observing and just seeing what was grabbing their attention and kind of, not directing them, but just picking up on these opportunities to improvise a little" (James [Class Teacher], Lines 132-135). Observations were used to gauge the children's interests, to present choices that met their interests, an autonomy supportive practice (Assor, Kaplan, & Roth, 2002; Stefanou, Perencevich, DiCintio, & Turner, 2004). These findings extend the body of research on autonomy support in education settings (Deci & Ryan, 2008a).

3.4.3.2 Competence

In self-determination theory literature, an increase in perceived mastery is sufficient to meet an individual's needs for competence (N. Adams et al., 2017). It was hypothesised that children would associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of intrinsic motivation at FS.

Perceived competence and intrinsic motivation were positively correlated across both cases. Themes and subthemes associated with competence are delineated in Figure 3.20.

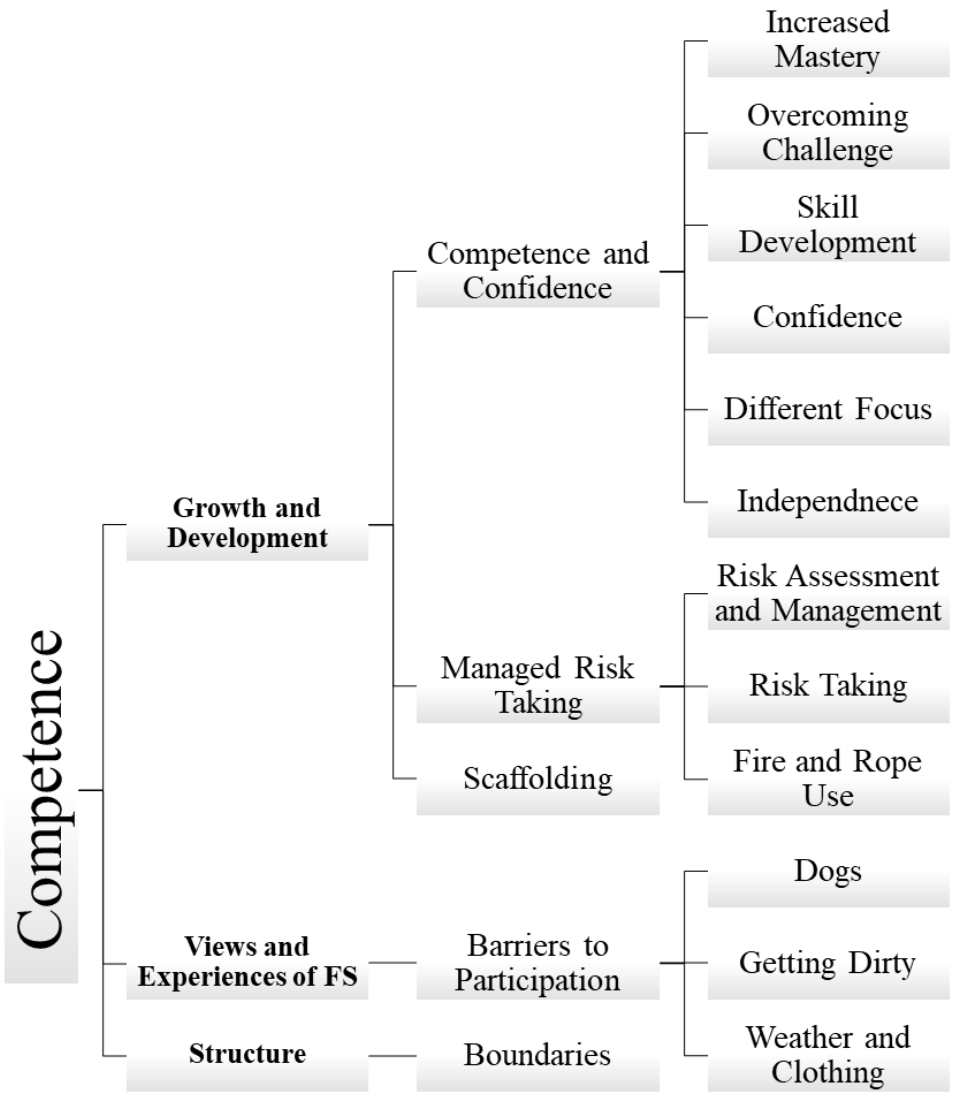

Figure 3.20. Competence: Themes and Subthemes.

3.4.3.2.1 Opportunities to take risks.

Under the subtheme ‘Taking Risks’, interviews with participants in Case 2 described the connection between taking risks and motivation during sessions. This replicates findings from other studies linking opportunities to take supported risks with a sense of increased mastery (K. Bradley & Male, 2017; Coates & Pimlott-Wilson, 2019; Harris, 2017). Both children in Case 2 included fire in their drawings, indicating that it was an important part of their experience. Finn described how the acquisition of the skill needed to start fire was a challenge at first: “I remember the first time of the flint and steel I was there for ages, like trying to make it spark and then I was able to get spark and then I was like, yay, I can light a fire” (Lines 154-156). Making the link with intrinsic motivation, he commented: “I like a challenge like if it was all easy there would be no fun” (Line 149). James, the class teacher, commented that this “stood out”

from his perspective as he “didn't see anyone give up and they did get there eventually” (Lines 147-148).

As outlined in Section 3.3.2.1, children in Case 1 did not have access to fire, tools, or ropes. The FS site lent itself to experiences of risky play (Sandseter, 2007, 2009) and one of the leaders described how “we are allowing them to do it [take risks] where we can so like that clambering around on the rocks, that swinging from or climbing trees – a lot of that” (Jane, Lines 200-203). Sadie gave an example of how risky play gave a sense of increased mastery, linking “we find the perfect spot up on the rocks” (Lines 15-16) with enjoyment of a game, while Rosie, one of the parent volunteers, recalled a child who “figured out the different things that had been like really tricky at the beginning and just his sense of fulfilment from that you could really sense it” (Lines 526-527).

3.4.3.3 Relatedness

Relatedness is conceptualised as a sense of connectedness to significant others (Deci et al., 2013). It was hypothesised that children would associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of intrinsic motivation at FS.

Perceived relatedness and intrinsic motivation were positively correlated in both cases. Teamwork and playing together emerged as codes within the ‘Relationships with others’ subtheme, as outlined in Figure 3.21.

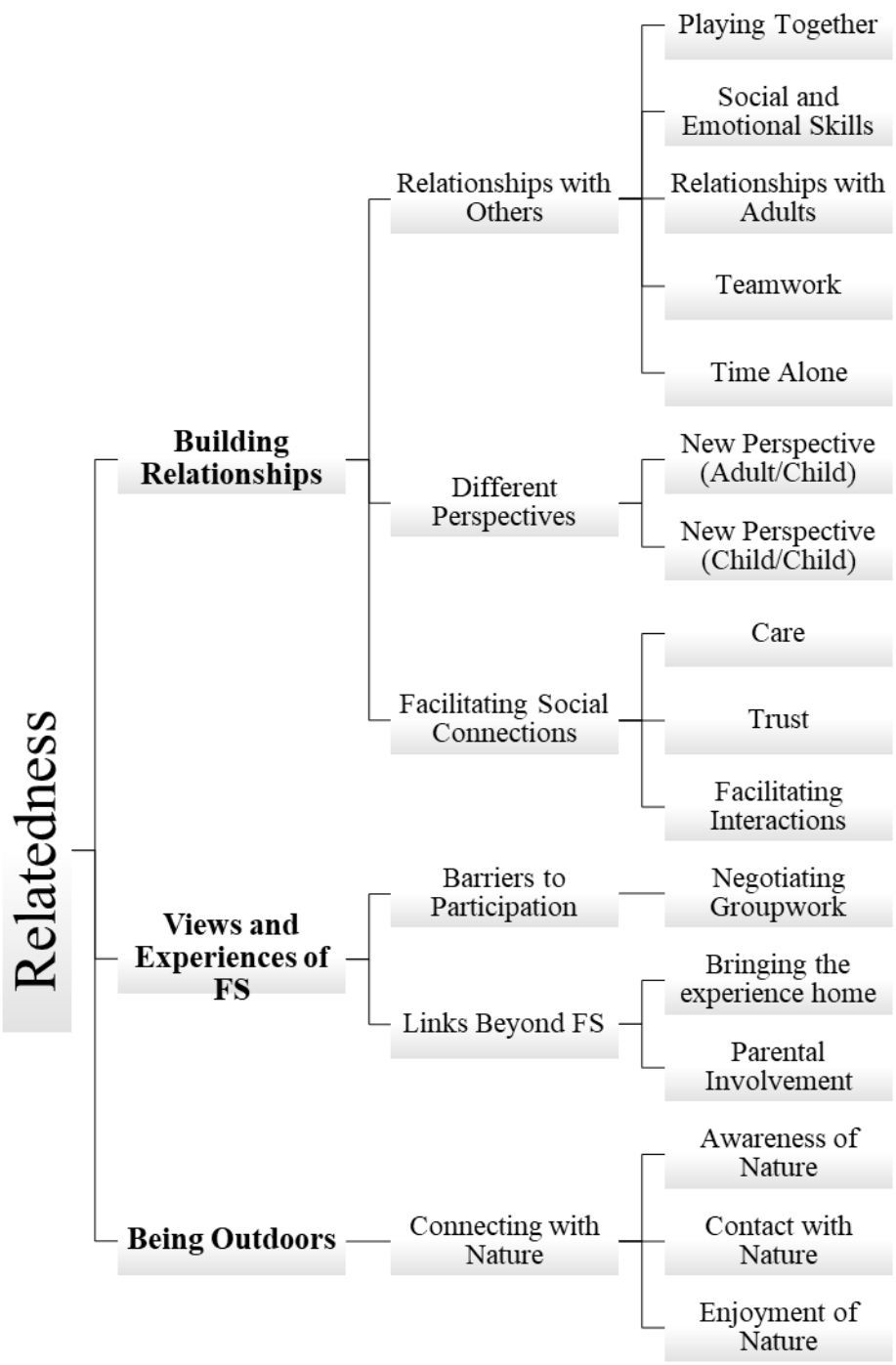

Figure 3.21. Relatedness: Themes and Subthemes

3.4.3.3.1 Relationships with others.

Participants in both cases associated FS sessions with opportunities to develop relationships with adults and peers through group games, cooperative tasks, and autonomy supportive communication. Children in Case 1 also spoke about choosing to spend time alone. Previous research has suggested that learning to take time away from others may be a strategy that children develop to mitigate social conflict (Coates & Pimlott-Wilson, 2019). Relationships, including caring for others and being cared for,

are at the core of human development, including in education (R. M. Ryan & Powelson, 1991). Positive interactions with teachers and peers provide a sense of relatedness in the school context (Hamre & Pianta, 2001; Pianta & Stuhlman, 2004; Wang, Hatzigianni, Shahaeian, Murray, & Harrison, 2016).

3.4.3.3.2 Nature relatedness.

Forest School sessions gave children regular access to a woodland environment, the impact of which will be discussed in greater detail in the next section. In terms of relatedness, however, it has been considered that the development of a relationship with nature may also satisfy the relatedness component of SDT (Barrable & Arvanitis, 2019). Research has linked nature relatedness and social relatedness, with nature having a role to play in both social and personal outcomes (Weinstein et al., 2015).

3.4.4 RQ3: Can children's experiences be explained by nature connectedness?

It was hypothesised that children would associate access to the woodland environment, including trees and wildlife, with variability in opportunities to connect with nature. All participants in Case 1 reported as connected to nature while 94% of participants in Case 2 reported as connected. Themes and subthemes in the participants' interview responses mostly reflected the scores on the CNI (Cheng & Monroe, 2012), with greater emphasis on nature in Case 1. Participants' relationship with nature was developed through working with natural materials in both cases. Mindfulness activities, to reflect on their surroundings through the senses, and activities focused on noticing plants and wildlife in the woodlands were more common in Case 1. These findings reflect research on pathways to NC in an adult population, with activities that encompassed contact with nature, emotion, meaning, compassion, and beauty associated with a stronger connection to nature (Lumber et al., 2017).

Themes and subthemes associated with NC, across both cases, are delineated in Figure 3.22.

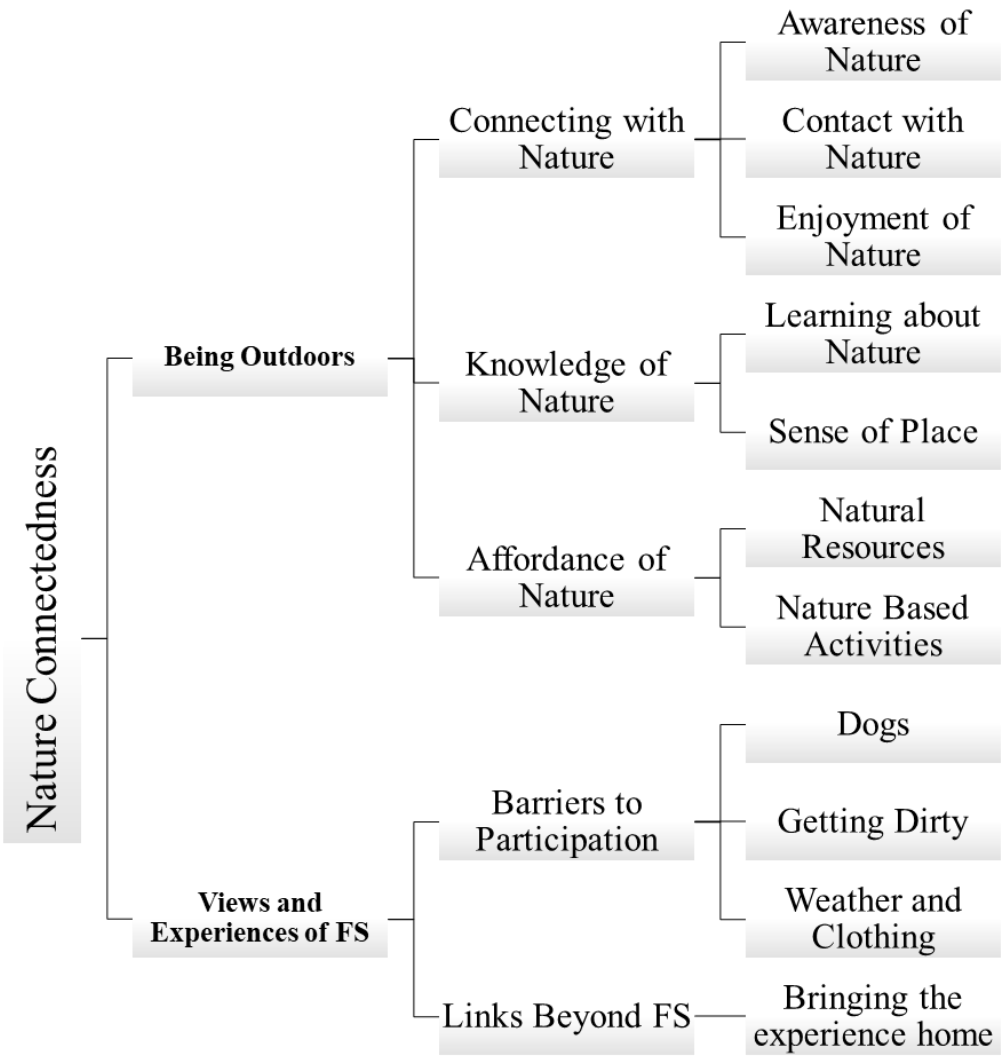

Figure 3.22. Nature Connectedness: Themes and Subthemes

Although FS sessions in both cases took place in a woodland setting and participants 'knowledge of nature' emerged in both, teaching children about nature was not an explicit goal of sessions, a perspective shared by FS leaders in previous research (Harris, 2017). Participants spoke about immersion in nature "having that couple of hours out in the fresh air, it's, it's nearly a sort of meditation or you know, just getting out into the fresh air, deep breath, open space" (Beth [parent], Case 2, Lines 173-176), appreciation of nature "bringing them closer to nature and giving them a revised or sort of refreshed appreciation for it" (Anna [parent], Case 1, Lines 34-35), and curiosity about nature "I get to like spread out and like do what I want with nature" (Kate [child], Case 1, Lines 140-141).

3.4.5 Summary.

This study set out to explore FS in the Irish primary school context and to empirically investigate SDT and NC as potential frameworks to explain experiences of wellbeing. As FS is a relatively novel practice in Irish schools, RQ1 sought to examine the extent to which practice reflected the IFSA guiding principles (IFSA, n.d.). The study found that FS practice in both cases largely aligned with these six principles. In Case 1, however, fire, ropes, and tool use were inhibited by insurance. In Case 2, the three-session block fell short of the number of sessions in studies examined through the systematic review of evidence.

The study used a case study methodology to examine participants' perceived autonomy, competence, relatedness, and connection with nature. Though on a small scale, the study collected data using multiple methods and from multiple perspectives. In relation to RQ2, the study found that children in both cases reported high levels of autonomy, competence, and relatedness on the adapted BPNS (Gagné, 2003). Furthermore, competence and relatedness were significantly correlated with a brief measure of intrinsic motivation across both cases. Regarding RQ3, all children in Case 1 and the majority of children in Case 2 reported high levels of nature connectedness on the CNI (Cheng & Munroe, 2012). These findings were elucidated though pattern matching and TA of participants' interview responses. The combined findings have provided a more in-depth insight into a theoretical understanding of the nature of children's wellbeing in the FS context.

3.4.6 Implications of the research.

The findings of the current study point to the following implications from a research, policy, and practice perspective:

Research

- Both SDT and NC have been associated with psychological wellbeing in the literature (Chalquist, 2009; Mayer et al., 2009; R. M. Ryan & Deci, 2001). As the findings of case study research are generalisable to theoretical propositions as opposed to populations (Yin, 2014), the current study expands upon a theoretical understanding of wellbeing in FS. This contributes to knowledge of the topic in psychology.
- As the understanding of children and young people's wellbeing has moved from individualised, within-child factors, so too has the role of the EP

(Cameron, 2006). This is reflected in the NEPS framework for practice, emphasising that EPs have a role in supporting all pupils (NEPS, 2007a). The findings of this study show that FS was a universal as opposed to a targeted approach in these schools. Cameron (2006) advocates that EPs have an important role to play in wellbeing promotion in addition to reacting to identified problems; the findings of this study address the former, contributing to the knowledge base on the potential of FS for wellbeing promotion.

Policy

- The findings of the current study must be considered in the context of national and educational policy. The national policy document 'Better Outcomes Brighter Futures' sets out aims for children and young people, including good mental health, positive social and emotional wellbeing, engagement in learning, and enjoyment of play and nature (DCYA, 2014). Pattern matching applied to participants' interview transcripts highlighted examples of engagement in FS across both cases. Furthermore, enjoyment of play and nature emerged through the TA process. On the whole, the evidence in the review paper and the findings of this study suggest positive effects for FS on wellbeing, although more robust research is required. National policy is reflected in educational policy, with schools having a significant role to play in the promotion of children's wellbeing (DES, 2019b). The findings of this study suggest that FS in the Irish primary school context is worthy of further study in terms of a potential opportunity to translate policy aims into educational practice.
- National play policy defines play as "freely chosen, personally directed, intrinsically motivated behaviour that actively engages the child" (National Children's Office, 2004, p. 11). The findings of this study suggest that within education settings play is somewhat restricted by boundaries such as time and space. However, designating explicit time for 'free play' and allowing it to precede over other plans in Case 1 was found to resonate most closely with this definition and was perceived as autonomy supportive by the children.

Forest School Practice

- The implementation of FS involves the allocation of resources including money to train or employ FS leaders and time to engage in sessions. Both

schools included in this study required additional untrained staff to support the implementation of FS, including teachers and SNA's. The findings of this study may be used by schools to prepare staff for sessions, with a view to promoting autonomy, competence, relatedness, and nature connectedness. This is discussed in greater detail in Section 4.5.4.

Educational Practice

- The current study is an example of the application of scientific thinking and acting to an under-theorised and novel aspect of educational practice (Shapiro, 2002). The findings of this study illustrate the application of theory to FS practice in the Irish primary school context and, through dissemination, may be used to inform practitioners about the potential implications of autonomy, competence, relatedness, and nature connectedness for wellbeing in this setting.
- FS is an alternative education, particularly in the Irish context. However, the findings of the study demonstrate that it may have the capacity to situate outdoor learning in schools. This reflects research in the UK context (Harris, 2017).

Educational Psychology Practice

- Within the field of educational psychology, there is increasing emphasis on EPs as scientist practitioners, described as "someone who applies critical thoughts to practice, uses proven treatments, evaluates treatment programmes and procedures, and applies techniques and practices based on supportive literature" (Jones & Mehr, 2007, p. 770). However, for EPs working in the school setting, research is recognised as a somewhat neglected aspect of the role (Huber, 2007; Passenger, 2013). This research project is an example of collaboration between EPs and schools. Similar collaborative projects may offer a model that EPs could use to conduct research in school settings.

3.4.7 Limitations.

Limitations are recognised concerning some of the measures used in the current research. The findings of this study demonstrated correlations between competence, relatedness, and intrinsic motivation across cases. However, there were limitations inherent in the brief measure of intrinsic motivation used. A separate measure of wellbeing, against which to compare findings on the other measures, was also not included. Based on the study's findings, it is proposed that a measure such as The

Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2007) or The Stirling Children's Wellbeing Scale (Liddle & Carter, 2015) would be a valuable addition to future studies. According to Cheng and Munroe (2012), the CNI is a trait measure as opposed to a state measure. The number of sessions, therefore, may have impacted the participants' perceived connectedness. The participants in Case 1 had attended seven sessions when the CNI was administered compared with three sessions for the participants in Case 2. The strengths and limitations of the measures used in the current study will be elaborated on in Chapter 4.

This study aimed to explore the application of a SDT and NC framework to FS practice. Measures of basic psychological needs and nature connectedness were only administered at one time point and therefore did not measure changes over time. This is a limitation of the current study. As the current study demonstrated some evidence of autonomy, competence, relatedness, and nature connectedness, albeit, within a limited sample, future research may adopt an experimental design to explore if changes occur over time.

An explanatory case study design was used in this study. While the findings, across both cases, align with SDT and NC, it is important to consider the role that other conceptual frameworks may have in the understanding of participants' experiences. Some SDT researchers posit that novelty has a role in need satisfaction (González-Cutre, Sicilia, Sierra, Ferriz, & Hagger, 2016). As codes including 'a different learning space' and 'a different behavioural space' emerged across participant interview responses, the impact of the novelty of FS must be considered. Green exercise refers to physical activity that takes place in a natural environment and has been associated with physical and mental health benefits beyond those typically obtained from physical activity alone (Calogiuri, Patil, & Aamodt, 2016). Forest School sessions included extended physical activity in a woodland setting, the effects of which were not addressed by the current study.

3.4.8 Conclusion.

This study's findings contribute to the knowledge base on wellbeing in FS. Specifically, this research addressed a gap in the literature, by underpinning experiences of wellbeing in FS with psychological theory. Furthermore, no previous research to date had explored the role of the SDT in FS empirically. This research also extended the limited empirical data on NC in FS, offering insights into the potential of this form of

outdoor education to provide children with an opportunity to develop a relationship with nature, a predictor of wellbeing. Limitations included the measure of intrinsic motivation, the lack of a distinct measure of wellbeing, and the generalisability of case study findings to theoretical propositions as opposed to similar populations (Yin, 2014). However, this study may be the foundation for a more extended exploration of SDT and NC in FS.

4. Critical Review

4.1 Overview

This section of the thesis is a space for critical reflection on the research project. A reflexive stance is taken as the researcher appraises the doctoral research journey. The section starts with a reflection on the epistemological stance of the researcher and the chosen methodology. Strengths and limitations of the research project are outlined by comparing the study against five characteristics of an exemplary case study (Yin, 2009). Implications for policy, practice and future research are considered.

4.2 Research Paradigm

Prior to the consideration of appropriate research methods, Guba and Lincoln (1994) suggest that the research paradigm should be explored. A paradigm represents a particular view of the world, based upon a set of philosophical assumptions that guide how a person thinks and acts upon the world (Mertens, 2015). As the choice of research methods will be guided by the researcher's paradigm and philosophical assumptions, the researcher needs to make their position clear at the outset (Denscombe, 2010).

This research is positioned within a constructivist paradigm. This reflects the researcher's position and aligns with the principles of FS. The core assumptions of constructivism are that reality is subjective and multiple as seen by the participants in the study and that the research is context-bound. While assuming that reality is constructed by individuals interacting with their social world, the meaning of this reality can be mediated through the investigator's perceptions (Merriam, 1998). Though grounded in a defined context, the patterns and theories that emerge can be developed to provide a deeper understanding of a situation or phenomenon, aligned with an inquiry aim of understanding and reconstruction (Guba & Lincoln, 1994, p. 112).

Guba and Lincoln (2005) identify four interconnected belief systems that help to characterise a paradigm. However, a research paradigm is not definitive, rather the worldview that most closely approximates with the researchers own (Mertens, 2015, p. 58). The four belief systems are reflected upon in the proceeding sections to outline how the constructivist paradigm guided this study and to reflect on instances where tensions arose.

4.2.1 Axiology.

The axiological question asks 'What is the nature of ethics?' (Mertens, 2015, p. 58). A constructivist paradigm emphasises "that research is a product of the values of researchers and cannot be independent of them." (Mertens, 2015, p. 58). For this reason, the researcher outlined their position in the introduction to this study so that their background and interest in the area were clear from the outset. As well as the researcher's values being clear, a balanced representation of participant's views must be reflected in the study's findings. The researcher used a reflective diary to reflect on each observation and interview undertaken. This gave the researcher the opportunity to address their feelings and potential biases before formal analysis and write-up of the study.

4.2.2 Ontology.

The ontological question asks 'What is the nature of reality?' (Mertens, 2015, p. 58). A constructivist paradigm assumes that there are multiple, socially constructed realities, influenced by both participants and the researcher (Mertens, 2015). This aligns with the researcher's view that wellbeing is not defined by within-child factors but is co-constructed in a social context (Narvaez & Witherington, 2018). A constructivist ontology recognises that with multiple perspectives there may come "conflicting social realities" (Guba & Lincoln, 1994, p. 111). As the researcher brought their own conceptual framework to this research, the aim of the study was as much to challenge this framework as to confirm it. Therefore, a constructivist ontology that sought multiple perspectives and gave equal weight to these multiple voices was important. This stands in contrast to a positivist and postpositivist ontology which assumes that there is a singular, objective reality (Mertens, 2015).

4.2.3 Epistemology.

The epistemological question asks 'What is the nature of knowledge and the relationship between the knower and the would-be-known?' (Mertens, 2015, p. 58). According to Schwandt (2000), the researcher's role is to attempt to understand the complexities of lived experience from the point of view of those who live it. A constructivist epistemology, therefore, is more commonly associated with exploratory as opposed to explanatory research. However, as outlined by Guba and Lincoln "the investigator and the object of investigation are assumed to be interactively linked so that the 'findings' are literally created as the investigation proceeds" (1994, p. 111). The

researcher made their values clear and the nature of the study was bound to a specific context, FS in the Irish primary school. The aim, therefore, was not to produce information that is absolute or generalisable to wider audiences. The study aimed to choose methods that would enable the researcher to collaborate with participants in an attempt to create new knowledge (Guba & Lincoln, 1994). This aligns with a constructivist epistemology.

4.2.4 Methodology.

The methodological question asks 'How can the knower go about obtaining the desired knowledge and understandings?' (Mertens, 2015, p. 58). As outlined in the researcher's axiology, ontology, and epistemology, reality is viewed as multiple and socially constructed. These constructions can be "elicited and refined only through interaction between and among investigator and respondents" (Guba & Lincoln, 1994). This led to predominantly qualitative methods of data collection, with the inclusion of relevant quantitative data for triangulation. The use of multiple sources of data and multiple methods to collect the data enhanced validity and emphasised the value placed on the multiple perspectives. The next section details the application of a case study design to the current study.

4.3 Case Study Design

It must be acknowledged at the outset that differences of opinion exist as to whether a case study can be considered a research design. Stake (2005) contends that a case study is not a methodology but instead is determined by how "specific, unique and bounded" (p. 445) the system to be studied is. Similarly, G. Thomas (2011) focuses on the boundaries of the case as what defines the need for a case study. However, case studies have been described by Mertens (2015) as a research strategy and by Creswell (2018) as a research design as case studies can employ different methods to collect data relevant to the case that is to be studied.

Forest School, although widespread across Britain, is a relatively uncommon practice in Ireland and thus has not been widely explored in published literature. Although the Irish Forest School Association adopts a similar framework for practice as Britain, the historical, social, and political differences in the education systems may influence how theory is translated into practice. The first research question to be answered, therefore, was 'What is happening during FS sessions?'. A case study should provide a "detailed description to give the reader a good sense and feel for the

institution under investigation" (Roberts-Holmes, 2005, p. 47). A qualitative design that included interviews with more participants across a wider variety of contexts was also considered by the researcher. However, given the potential impact of school context on FS (Kemp, 2019) it was decided that a case study design provided the best scope to capture how FS has been translated into the Irish primary school context.

Forest School is more than just the physical, outdoor space. It employs a unique pedagogy that influences the activities and interactions a child will experience while in this space. The second part of the research study sought to explore how SDT and NC might explain the experiences of wellbeing evidenced in the literature review. As well as exploring or describing educational or social programmes, case studies can be used to explain how such programmes might work (Moore, Lapan, & Quartaroli, 2012). In contrast to exploratory or descriptive case studies, explanatory case studies seek to "explain the presumed causal links in real-life interventions" (Yin, 2009, p. 19). Although research examining self-determination and connection to nature in education has typically used scale measures, FS in Irish primary schools is a contemporary phenomenon with a limited sample size. A case study design provided the methodological flexibility to include quantitative measures of autonomy, competence, relatedness, and nature connectedness while also capturing participants' individual constructions of these concepts, in line with a constructivist paradigm.

4.4 Strengths and Limitations of the Research Design

The case study approach, as with most research designs, is not without its criticisms. The effective application of a case study design to this research study was largely dependent on the decisions made by the researcher, within the boundaries of a taught doctoral programme. These decisions were influenced by strengths and limitations within the researcher's skill set. Yin (2009) outlines five characteristics of an exemplary case study. The current project will be compared against each of these five characteristics in turn, as a means of exploring the strengths and limitations. The aim of this reflexive process is to develop the ability to critically reflect on research, an essential skill going forward as a practitioner (Keith, 2008).

4.4.1 The case study must be significant.

According to Yin (2009), an exemplary case study may be one where "the underlying issues are nationally important – either in theoretical terms or in policy or practical terms" (p.185). Forest School is a contemporary phenomenon in the Irish education system. The number of schools with FS sessions as part of their curriculum is small but growing (IFSA, n.d.). This growth is occurring against a dearth of empirical research on FS in the Irish context. Furthermore, the research base for FS stems mostly from an outdoor education perspective rather than a psychology perspective, despite evidence of mental health benefits (K. Bradley & Male, 2017; Harris, 2017, 2018; L. O'Brien, 2009; L. O'Brien & Murray, 2007). The current study aimed to explore conceptual frameworks that may enhance understanding of experiences in FS as they relate to psychological wellbeing.

The Psychological Society of Ireland (PSI) encompasses within the role of an EP the promotion of the psychological and educational development of any individual in our education system (PSI, 2017). One of the core assumptions of a scientist-practitioner model of educational psychology practice is that conducting research is one way of enhancing the field's scientific database (Jones & Mehr, 2007). With this in mind, the underlying issue of the case of FS in Irish primary schools was considered to be important in the Irish education system. As schools have to invest resources, including money in the training or employment of FS leaders and children's and teacher's time to engage in sessions, there is a practical relevance to this case. As educational and health policy (DCYA, 2014; DES, 2019b, p. 10) include a shared vision regarding the health and wellbeing of children in this country this case may have implications for policy. Finally, as a gap was identified in studies that focus on the theoretical basis of FS practice, the outcomes of this case may be important in theoretical terms.

4.4.2 The case study must be 'complete'.

One of the biggest challenges in case study research is to decide on the case itself, or the most appropriate case to illustrate a particular issue (Creswell, 2018). If a case is to be complete, Yin ascertains that the researcher must have given explicit attention to "the distinction between the phenomenon being studied and its context" (2009, p. 186). The intended audience of this study was educational and child psychologists, in particular those working in the Irish context. Although FS is more common in preschool settings (Murphy, 2018), the National Educational Psychological

Service (NEPS) does not extend its services to preschools (Swan, 2014). Therefore, cases of FS in Irish primary schools were deemed to better reflect the client base for EPs working in the Irish school system. Primary schools offering FS, therefore, were the cases and FS the unit of analysis.

4.4.2.1 Sampling.

Forest School sessions are not a clearly defined entity. Additional decisions had to be made to establish the boundaries of the case before a sample could be recruited. According to Yin (2009), these boundaries include time boundaries and participants. The case boundaries were informed by the study's aims. These aims were to understand what is happening in the FS sessions and if these experiences could be explained by SDT and NC. To find out what FS in the Irish primary school context looks like, it was deemed prudent to observe FS sessions. As FS sessions typically occur in blocks, the time boundary would be the length of a block of sessions with one class group.

In order to explore experiences of wellbeing in FS, this study aimed to determine if participants perceived opportunities to experience autonomy, competence, and relatedness (R. M. Ryan & Deci, 2000), and a connection to nature (Cheng & Monroe, 2012) during sessions. Initially, it was felt that obtaining the perspectives of children would best answer the research questions. This decision was informed by the view that children are entitled to a voice in their own experiences and therefore, were best placed to express their own experiences of wellbeing (McTavish, Streelasky, & Coles, 2012; Powell, Graham, Fitzgerald, Thomas, & White, 2018). However, this did not accurately reflect the researchers' broader conceptualisation of wellbeing. This aligned more closely with Bronfenbrenner's systems-based model of wellbeing, with an interconnectedness between an individual, their immediate social context, and the wider community. With this comes the premise that "wellbeing is always realised in a community" (DES, 2019b, p. 10). Therefore, it was decided that children, along with FS leaders, teachers, and parents were key participants in each case. This sample also better reflected the constructivist ontology of multiple, socially constructed realities. The unit of analysis was, therefore, defined as a block of FS sessions in an Irish primary school, with children, FS leaders, teachers, and parents as participants.

The ability to obtain the desired sample was a limitation of this study. As FS is defined by a set of principles that differ from other forms of outdoor education, it was important that each case of FS included strove to adhere to these principles. The

researcher sought cases led by qualified FS leaders (IFSA, n.d.). Thereafter, cases with a minimum of six sessions in the block were pursued, the minimum number of sessions in studies included in the systematic review of the literature (Coates & Pimlott-Wilson, 2019). Due to the emergent nature of FS in primary schools, only one case with more than six sessions in the block was obtained. The study was aimed at schools running sessions with children between 2nd and 6th class, to ensure the children would be a suitable age to reliably complete the methods chosen. More schools appeared to involve infant classes in FS. The data collection methods used may be adapted to include younger children in future research, thus widening the potential sample.

Purposive sampling was used to select potential research sites. Included on the website of the Irish Forest School Association is a map where members can list a FS. Those that indicated a link to a primary school were contacted via email, to introduce the researcher and to outline the research study. Schools with upcoming blocks of FS who might be interested in participating were invited to contact the researcher for further information. Of the twenty-four leaders contacted, three were running sessions in primary schools at a suitable time, between March and December 2019. One of these was itself a pilot project where a first- and second-class group accessed one session across each of the four seasons. It was decided that one of these sessions, in April 2019, would be used as the pilot project for the study. Although this limited the measures that could be piloted it was determined to be the best use of the sample. Data collection in Case 1 followed the pilot between May and June 2019 with Case 2 scheduled for October 2019. However, following a change of personnel in the second school, Case 2 did not go ahead as planned. Therefore, the researcher had to source another case at a late stage. The Irish Forest School Association and Irish Heritage Council were contacted to obtain additional contacts. Through this process, a second case was secured in November 2019. Although this case had a three-session block it was considered more valuable to have a second case than to exclude it on these grounds.

4.4.2.2 Methods.

There is a lack of consensus on the design and implementation of case studies. As no comprehensive summary of methods is available, a range of designs can be considered depending on the context and case in question (Yin, 2009). The research methods chosen for this case study were linked to the theoretical propositions under

investigation. The strengths and limitations of each method will be discussed, along with considerations for future research.

4.4.2.3 Observations.

Observations are an important part of case study research as they provide a context for the case (Yin, 2009). Observations were used by the researcher as a means of answering the first research question, 'What is happening during Forest School sessions?'. Observations, as a source of evidence, are not without weaknesses. Some of these the researcher addressed successfully. In this study, the observations provided useful information about experiences in real-time and enabled the researcher to understand better the problems encountered in the translation of FS into a primary school content (Yin, 2009). The inclusion of observations also improved fidelity as it enhanced the connection with the phenomenon under study, providing the researcher with a context against which to analyse the interview data (Levitt, Motulsky, Wertz, Morrow, & Ponterotto, 2017, p. 10). After each session, the researcher compared the field notes against the six principles of FS as a form of initial analysis and to enhance reflexivity.

Other aspects of observations were more challenging to address, and this must be acknowledged. The observations were somewhat selective as the researcher was alone. This meant, for example, that observations were only of some participants in each case. The researcher also had to consider that they may, unconsciously, attend to particular participants more than others during observations. In an attempt to address this selectivity bias the researcher took time to reflect on each observation session using a diary, in line with a constructivism paradigm (Mertens, 2015). This allowed the researcher to consider if each session's field notes documented a balance of participants and events and to document how they were feeling at the time so that this could be considered when analysing the results in the future. Another weakness of observation is that the sessions may have proceeded differently because the researcher was present (Yin, 2009). Although this was somewhat beyond the researcher's control, it must be considered when interpreting the findings.

4.4.2.4 Semi-structured interviews.

Semi-structured interviews are another common source of evidence in case studies. They can be targeted to the topic of the study and can include questions relevant to the research questions and propositions to be explored, yet are flexible enough to

allow for rich discussion (Robson & McCartan, 2016; Yin, 2009). Semi-structured interviews have been used in previous research on FS with FS leaders, teachers, and parents (K. Bradley & Male, 2017; Harris, 2017; Kemp, 2019). In existing literature, the use of interviews to explore perspectives of self-determination (Hyde & Atkinson, 2019) and connection to nature (Delavari-Edalat & Abdi, 2010) is less evident than quantitative methods, presumably because well validated scale measures exist. However, as the aim of this study was to understand participants' perspectives on their experiences, it was felt that semi-structured interviews would complement the scale data and provide a more comprehensive understanding of the phenomena.

Qualitative research methods, including semi-structured interviews, are often subject to questions of rigour (Noble & Smith, 2015). Yin (2009) comments on the potential for bias as a result of poorly articulated questions and social desirability in responses. It was critical that the researcher was mindful of this and took steps to address potential biases. The semi-structured interviews were designed using open-ended questions, questions used non-leading language or questions presented in tandem to get a balanced response e.g. participants were asked about both the benefits and the challenges associated with FS (Levitt et al., 2017). As the questions focused on elements explicit in the aims of FS, probing was important, to compare participants' real-life examples against the study propositions. For example, the opportunity to develop relationships is outlined in the aims of FS. The researcher used an open-ended question about opportunities to develop relationships in order to find out more about relationships in FS, to be compared against the proposition that relatedness would involve teamwork with peers and leaders.

The ability to conduct exemplary semi-structured interviews is a skill involving optimal question selection, putting participants at ease, and effective use of probing (Brinkmann & Kvale, 2015). Some of these skills were developed throughout this doctoral programme, through research methods modules and professional skills development. These were transferable to the semi-structured interviews in this study. However, the real-life experience gained throughout this research project itself was even more valuable. Although it was not feasible, a more comprehensive pilot study would have enhanced the researchers' skill set in this domain, testing interview schedules with all participants and providing more in-depth experience at an earlier stage of the project.

4.4.2.5 Child conversations.

The absence of the child's voice in FS research was noted in the systematic review of literature that informed the current research project. To address this gap, the researcher initially proposed giving the children a journal to write or draw in after sessions and conducting semi-structured interviews with children at the end of the block. This raised an ethical question about the time children would be asked to spend on these journals and whether it should occur during class time or FS time. Upon reflection, it was decided that a 'Draw, Write, and Tell' approach to child conversation could combine drawing, writing, and the interview in a discrete session. The opportunity to draw before answering questions has been shown to create a space where children can externalise their thoughts before the more abstract conversation occurs, bringing out the complexities of children's experience (Coad, 2007; Driessnack, 2005; Driessnack & Gallo, 2013). This approach also helped to reduce social desirability, allowing children to draw or write what is important to them about FS before the researcher asked any questions. The children created their own narrative based on their picture which reduced the researcher's bias when analysing the transcript (Angell & Angell, 2013).

None of the children in this sample chose to write and older children did not draw pictures of the same complexity as younger children. As the methodology was child-centred, the researcher accepted the children's work as it was. However, during the research process one of the teachers commented that they asked the children to write and draw about FS in class and were fascinated by the depth of material produced. Future research may benefit from children having time to draw and write about FS more regularly, possibly planned with the class teacher to offset the ethical dilemma, to bring this depth to the research study.

4.4.2.6 Basic Psychological Need Satisfaction at Forest School scale.

The Basic Need Satisfaction Scale (BPNS; Gagné, 2003) was modified in the present study to assess need satisfaction in FS. The original scale had 21 items concerning the three needs for autonomy, competence, and relatedness. Studies in other domains in education have used measures with fewer items (Franco & Coterón, 2017). For future research, scales with fewer items may be more accessible to children. The original scale had nine negatively phrased items, to be reverse scored. Following a pilot of the scale, six items that included the word 'not' were rephrased to minimise

confusion for children. As previous studies included older children than in Case 1, it was decided that the scales would be administered individually. This allowed children as much time as needed and enabled them to have the researcher read for them if they wished, similar to previous research with a similar age group (Rogers & Tannock, 2018). While it is acknowledged that this may have increased social desirability response bias (van de Mortel, 2008), it was deemed most appropriate for this sample.

Studies in similar domains including physical education and outdoor education have benefited from the inclusion of a standardised measure of intrinsic motivation (Goudas & Biddle, 1994; Ntoumanis, 2001; Sproule et al., 2013; Standage et al., 2006). This was an oversight on the part of the researcher in the current study. The measure of intrinsic motivation was formed from two questions focused on interest and enjoyment, initially included as trial items for participants. This limited the weight that could be placed on correlations between intrinsic motivation and autonomy, competence, and relatedness in the current study. However, the findings were promising, particularly for competence and relatedness in this setting. Future research should include a more comprehensive measure of intrinsic motivation.

Autonomy and the brief two-item measure of intrinsic motivation were not significantly correlated in either case in this study. Descriptive statistics, however, showed promising evidence for high levels of autonomy and motivation. Previous research examining self-determination theory in educational contexts has included a measure of autonomy support, such as the 'Learning Climate Questionnaire' (LCQ; Standage et al., 2006; Williams & Deci, 1996). This may be included in future research to provide a more comprehensive understanding of the relationship between autonomy support, autonomy, and intrinsic motivation in FS.

4.4.2.7 Connection to Nature Index.

The Connection to Nature index (CNI; Cheng & Monroe, 2012) was included in this study. The CNI has been validated as an appropriate measure for use with children aged 8-12 in the UK (Bragg et al., 2013). Programme evaluation is one of the intended uses of the CNI, making it suitable for use in this study. However, it is most fitting for long term programmes as it is a trait measure. This may have impacted upon its applicability to Case 2 and the results must be interpreted accordingly.

4.4.2.8 Single or multiple cases.

Rather than collecting all available evidence, Yin (2009) comments that the critical pieces, for example, those that address rival propositions, be considered completely. The purpose of this study was to collect empirical data to explore the proposition that FS practice supports self-determination and nature connectedness. With multiple cases, the researcher is afforded an opportunity to analyse the data within each case and also across cases (Yin, 2014). Multiple cases also allow wider exploration of research questions and theoretical evolution as similarities and differences can be considered (Eisenhardt & Graebner, 2007). Although the inclusion of multiple cases may allow for literal or theoretical replication (Yin, 2009), case study research is resource intense. Under time and financial pressure, the study of more than one case may dilute the overall analysis (Creswell, 2018). Yin (2009) states that when such restraints are known at the outset, a responsible researcher should plan accordingly. When this study was designed the researcher was aware that, during the college semester, one day a week was allocated to research. Based on this knowledge it was decided to include two cases in the study design as it would enable both an in-depth initial exploration of each situation and theory testing both within and across cases. The researcher decided that data from more cases could not be collected and analysed in appropriate depth. In terms of a complete case study, this had its limitations.

4.4.3 The case study must consider alternative perspectives.

An important component of an explanatory case study is the consideration given to multiple perspectives and rival explanations. As outlined in Section 4.4.2.1, multiple perspectives of leaders, teachers, children, and parents were considered within each case. This provided a valuable depth to the current study through triangulation and was a strength of the case study. It balanced the perspectives of those who may be perceived to be driving the FS agenda, such as FS leaders, against others who were involved because they were in the school at this time, such as parents. However, a weakness of this sampling approach was that there were only two children, teachers, and parents in Case 1 and one teacher, two children and two parents in Case 2. As the multiple perspectives of children, parents, and teachers were analysed together, the researcher attempted to maintain a balance between perspectives. This decision was also influenced by the resources available, including time for transcription and analysis. Although thematic analysis can be used to effectively analyse small data sets within case study research (V. Clarke & Braun, 2017), a limitation was that each perspective

lacked the depth of previous research with larger samples of leaders (Harris, 2017, 2018) or children (Coates & Pimlott-Wilson, 2019). Future research may have the capacity to increase the sample size so that data saturation is reached within the individual as well as multiple perspectives (Braun & Clarke, 2006; Sim, Saunders, Waterfield, & Kingstone, 2018).

The purpose of the case study is not statistical generalisability, but to choose a case that can shed empirical light on some theoretical concept or principle (Yin, 2014). To this end, it was important to consider, within each case study, evidence that challenged the four theoretical principles as well as other theories that may better explain experiences of wellbeing in this context. As the thematic analysis of qualitative data, in this case, was initially data-driven or deductive, it was important that potential researcher bias was managed to increase the studies integrity and fidelity (Levitt et al., 2017). One technique employed was to look for disconfirming evidence during the thematic analysis process and include conflicting data in the case report.

Some examples of conflicting data were coded under the subtheme ‘Barriers to Participation’. The main challenges related to being outdoors, including dogs, appropriate clothing, and fear of getting dirty. This suggested that all children did not associate being outdoors with enjoyment. Both parents interviewed in Case 1 commented on overcoming barriers such as those mentioned above, which enabled the children to appreciate and connect with nature. This may suggest that giving children the opportunity to develop a relationship with nature could play a moderating role in their experience of biophilia (Cho & Lee, 2018).

Use of more than one source of evidence, including observations, scale measures, and interviews also enhanced the study. This triangulation uncovered conflicting findings concerning some propositions that could then be explored. Autonomy was not significantly correlated with intrinsic motivation. In Case 2 ‘direction’ emerged as a code in interviews where one of the children associated skill-based activities, coupled with demonstrations, with direction or being told what to do. This was explored and considered in the context of the strong, positive correlation between competence and intrinsic motivation in this case and the literature on autonomy supportive practices. The language used in giving directions appeared “informational and flexible rather than controlling and rigid” (Reeve, 2006, p. 229). The information component was targeted at developing the children’s skill set. Flexibility was seen in the opportunities to be

creative in the implementation of the skills learned. This highlights the importance of communication in supporting autonomy and competence, an important consideration for FS leaders, particularly as sessions become more skills-based. In this case, it appeared from the participants' interviews that the leaders managed, to some extent, to balance both needs. However, the choices that existed between activities could have been emphasised to increase autonomy satisfaction.

The initial thematic analysis was followed by an inductive, or data-driven, analysis to ensure that alternative findings or theories were considered (Fereday & Muir-Cochrane, 2006). Examples of physical skills or physical activity were coded through inductive thematic analysis. These included running, climbing, and swinging from trees. From a deductive analysis, they were considered examples of risky play (Sandseter, 2007). Physical activity is also an important predictor of wellbeing for children (Bailey, Howells, & Glibo, 2018; Breslin et al., 2017). Engaging in physical activity in a green space, commonly termed green exercise, compared with physical activity alone, is associated with increased physical and mental health benefits for adults (Bodin & Hartig, 2003; Calogiuri et al., 2016; Pretty, Peacock, Sellens, & Griffin, 2005). Although research with children is not as confirmatory as in adult populations (Duncan et al., 2014; Kuo & Faber Taylor, 2004) the opportunity to engage in physical activity outdoors, as it emerged in this study, should be considered.

The impact of novelty is another aspect of FS that needs to be considered. Novelty as a primary factor in the arousal of interest and motivation of exploratory behaviour has been researched, including within self-determination theory itself (Barto, Mirolli, & Baldassarre, 2013; Deci & Ryan, 1985). Novelty may range from complete novelty, something that has never been encountered before, to long-term novelty, something that a person has not encountered for some time (Berlyne, 1960). Novelty is perhaps most closely related to the need for competence in the literature, as illustrated in the conceptualisation of intrinsic motivation as “the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn” (R. M. Ryan & Deci, 2000, p. 70). The findings of this study suggest that FS is, to some extent, associated with novelty. Forest School was coded as a ‘different space’ in interview transcripts, associated with “growth” away from the “pressure” of the classroom (Lucy, Class Teacher), an “alternative way of learning” (Anna, Parent) and “somewhere new” (Rosie, Parent).

Some of the codes that emerged through inductive thematic analysis, combined with deductive analysis, map onto 'Choice theory' (Glasser, 1999). According to choice theory, all behaviour is chosen to meet five needs; survival, love/belonging, power, freedom, and fun (Glasser, 1999). Belonging and freedom were reflected in the themes associated with relatedness and autonomy. Fun was demonstrated in codes associated with intrinsic motivation, particularly prominent in the participants' responses in Case 2. Power and survival in the most primitive sense were captured in a quote from one of the children in Case 2 about using fire "when we were cave people it was like the one safety against animals and stuff…and also it just feels powerful." (Finn, Case 2).

4.4.4 The case study must display sufficient evidence.

In an exemplary case study the critical pieces of evidence should be contained within the case report (Yin, 2009). Initially, the findings for each case were presented separately, followed by a cross-case discussion. This resulted in a lengthy case report. Through a process of supervisor feedback and personal reflection, it was decided that answering each of the three research questions, in turn, was a more effective way of presenting the report. Tables and figures were utilised, where appropriate, to condense volumes of data making it accessible for the audience. Consideration was given to presenting the data neutrally, with data that both supported and challenged the propositions where appropriate (Yin, 2009). Supplementary data were included as appendices, to elucidate the analysis.

4.4.5 The case study must be composed in an engaging manner.

As alluded to in the previous section, substantially more data were initially included in the case report. This resulted in a case study that was very lengthy and tedious to read. The structure of the case report was revisited in an attempt to balance the presentation of sufficient evidence with a more engaging presentation. The case report was read by a fellow TEP and their feedback incorporated.

4.5 Implications of Research Findings

This study aimed to explore experiences of wellbeing in FS through the theoretical lens of SDT and NC. The findings suggest that, in the Irish primary schools included, elements of FS practice align with SDT and NC. Accordingly, criticisms raised regarding the lack of a theoretical framework behind FS practice were addressed. Findings from this study, in the context of existing literature, reveal a number of

implications for the extension of both theory and practice in the domains of education and educational psychology. These are addressed in the sections below.

4.5.1 Implications for understanding and knowledge of the topic.

This research project augments an existing body of research on the application of SDT in education research (Guay, Ratelle, & Chanal, 2008), including behaviour (Aelterman, Vansteenkiste, & Haerens, 2019) and physical education (Standage, Duda, & Ntoumanis, 2005). Self-determination theory postulates that learning environments that support the basic needs: autonomy, competence, and relatedness, can stimulate a child's innate motivation or tendency to learn, a valuable resource for educators (R.M. Ryan & Deci, 2000). In contrast to pathology-based models, where wellbeing is identified as the mere absence of illbeing, SDT provides an interactionist perspective that reflects the understanding that wellbeing is realised through the interaction of within-child factors and environmental factors. In their conceptual article on the application of SDT to FS practice, Barrable and Arvanitis (2019) proposed that the basic psychological needs aligned with the core concepts in FS pedagogy. The current study collected empirical data to explore participants' experiences of autonomy, competence, and relatedness in FS in the Irish primary school context. The findings of the study outlined aspects of FS that are autonomy supportive and facilitated the three basic needs. The study also shed light on elements of practice that were perceived as less autonomy supportive and can be developed.

The health and wellbeing benefits of contact with nature have been demonstrated to transcend beyond the contact time and into later life (Bragg et al., 2013). This suggests promoting regular contact with nature early in life is beneficial (Pretty et al., 2009). Children in Case 1 self-reported higher mean scores on the CNI and the impact of being outdoors emerged to a greater extent in participant responses. Participants in Case 1, for example, spoke about how they returned to the forest site with their families. FS was a more established practice in Case 1, with the children attending nine weeks of FS in Senior Infants. Although this study did not control for factors such as children's contact with nature beyond FS, it suggests that FS may have the potential to offer children an opportunity to develop a connection with nature. Forest School may have additional benefits to offer as time spent in unstructured play in 'wild nature' such as the woods has been shown to offer more positive long-term effects (Bingley & Milligan, 2004).

As outlined in this study, spending time in natural environments is associated with health benefits and wellbeing. However, there exists a paucity of research into exposure-response relationships. A recent study examined associations between recreational nature contact in the last seven days and self-reported health and subjective wellbeing. Participants' reported significantly better health and wellbeing when direct contact with nature exceeded 120 mins, or two hours, compared to no nature contact over the week (White et al., 2019). While these findings suggest that spending 2-3 hours a week in nature may be an important threshold for health and wellbeing, the participants were limited to an adult population in England. Similar research with children, as well as longitudinal and experimental studies, is required before any clear conclusions can be drawn. In this case study, children had a minimum of 2 hours direct contact with nature a week through FS. Therefore, if the findings in adults (White et al., 2019) were to be reflected in studies with children, FS may have the potential to integrate a beneficial dose of direct access to nature into the curriculum.

4.5.2 Implications for practice.

- It is acknowledged that effective embedment of wellbeing in the education system will require more than policy changes (M. O'Brien & O'Shea, 2017). The challenge for schools is being "authentically or sincerely engaged in making wellbeing a reality" (p.5). In Case 1 in particular, FS was deeply embedded into school policy, including significant parental involvement. The identification and utilisation of resources already present in schools can enable the aims identified at policy level to be translated into authentic wellbeing promotion strategies (DES et al., 2015). Many EPs are situated in education settings and are already "working 'with' parents and teachers 'for' the benefit of children and young people" (Passenger, 2013, p. 27). As scientist practitioners, EPs are well placed to engage in programme evaluation (Keith, 2008). This is a contribution EPs could make to wellbeing promotion within schools.
- The practice of educational psychology includes the application of theories to teaching and learning (Hagstrom, Fry, Cramblet, & Tanner, 2007). Although the current study is on a small scale, the process undertaken demonstrated how EPs could collaborate with schools to evaluate practices that fit with a particular school context or ethos. This reflects the shift to EP as an artist as much as a scientist (Fox, 2011). According to Fox "EPs will need to be able to provide a range of psychological services to ensure that the choice of interventions

remains the client's" (2011, p.333). While Fox refers to individual interventions, the same may be said of whole-school interventions. If wellbeing promotion is to be embedded in a school's culture, the intervention must fit well with the school environment and community. This study demonstrates that EPs are particularly well placed to appraise approaches that schools report are working at a local level.

- In terms of interventions in applied settings such as schools, context and external validity need to be considered to the same extent as experimental control and internal validity (Green, 2008). School-based interventions need to be both socially and scientifically valid for educators to adopt them (Cook & Cook, 2013). The approach taken in this study may be considered an example of practice-based research, accounting for programme context interactions through a case-study design (Green & Glasgow, 2006). The TEP as researcher merged a rigorous research approach with real-world practice, in an attempt to inform an approach to wellbeing promotion that is both internally and externally valid.
- The researcher adapted the BPNS measure for the FS context. The adapted measure achieved acceptable levels of internal consistency. This measure may be used in future research to extend findings on SDT in FS school.

4.5.3 Implications for policy and curriculum.

There are explicit links made between health and educational policy regarding mental health promotion and wellbeing for CYP in the Irish context. One of the five desired outcomes set out by the government in the 'Better Outcomes Brighter Futures' document is that children 'are active and healthy, with positive physical and mental wellbeing' (DCYA, 2014). This is reflected in education policy which advocates for a whole school approach to wellbeing promotion, encompassing the school's culture, curriculum, policy and planning, and relationships, across the primary and post-primary school (NCCA, 2017; DES, 2019b). These policies are based upon the premise that mental health promotion in schools should be grounded in the enhancement of psychological strengths and competencies rather than emerging from a deficit perspective (DES et al., 2015). One way that the promotion of health and wellbeing at a whole school level is conceptualised for schools is through the Health Promoting School (HPS) framework (see Section 1.4).

The findings of this study are discussed in relation to the three aims of a health promoting school (DES et al., 2015, p. 15) below:

- *To provide a framework for developing health promoting initiatives in a way that supports and enhances the implementation of the curriculum*; Health in this context is synonymous with wellbeing, encompassing psychological and physical wellbeing (Turunen, Sormunen, Jourdan, Von Seelen, & Buijs, 2017). The findings of the current study suggest that FS may be viewed as a health promoting initiative for primary schools that have adopted this approach. The findings indicate that FS promotes wellbeing through opportunities to experience autonomy, competence, relatedness, and nature connectedness. Physical wellbeing, although not explicitly addressed in this study, emerged in participant responses.

  Although the delivery of the curriculum is not an explicit aim of FS sessions, participants recognised that the children engaged in a range of curricular activities including science, geography, art, physical education, and language development. Jane, a leader in Case 1 and a special education teacher in the school commented in her interview that "I cover more of the curriculum there [FS] that I ever would down here [school]". Participants' experiences of FS, captured in the 'Views and Experiences of FS', suggested that for children, teachers, and parents FS enhanced the implementation of the curriculum.
- *To support the planning, implementation, and evaluation of health-related activities;* The outcomes of the systematic review of the literature and the findings of the current study may be used to support the planning, implementation, and evaluation of FS sessions from a self-determination theory and nature connectedness perspective. This is explored in greater detail in Section 4.6.3.
- *To enhance the links between a school and its community;* In Case 1 home-school links emerged in participants' interview responses. Parents and teachers gave examples of children who brought their parents back to the FS site after school. These included children that would already have been perceived as connected to nature and children who would not. Due to the practical nature of sessions in this case and the age group of the children, the parents were involved through volunteering. Other schools may benefit from the involvement of parents in FS.

4.5.4 Implications for Forest School practice.

This study points to some potential implications for FS practice. These are informed by the systematic review of the literature (Section 2.9) and the study findings (Section 3.3) and are outlined in Table 4.1.

Table 4.1.

Overview of potential implications for FS practice

Domain	Suggested strategies for effective FS practice
Autonomy	• The establishment of clear boundaries can enable the children to freely explore the space within the boundaries. As children become familiar with the boundaries they may be expanded. • Explicit opportunities for 'free play', communicated to the children, may increase children's sense of perceived autonomy. • Choice emerged as an important means of facilitating perceived autonomy in this study. Some examples of choices that may be offered include the choice between a group or individual activity, the choice between an activity and free play, the choice between different activities, the children choosing the activities for a parent session. • In cases where a skill associated with a specific activity is demonstrated, it may be more important to emphasise that there still exists a choice between the skill-based activity and other activities. • Autonomy supportive communication, including observation and the use of inquisitive as opposed to directive language, is important. Statements that start with 'I wonder' are an example of inquisitive language. • The use of observation enables adults to see what children are drawn towards and to follow their lead. • Where FS sessions in school are planned, with curricular goals in mind, the plans should be flexible if the learning is to be child-led.

Competence	• A risk assessment of the FS before each session is necessary to ensure that risks are appropriate. In Case 2 the leaders used red ribbons or tags to identify areas that posed additional risk e.g. a hole in the ground. • Sharing the risk assessment process with the children develops skills that enable them to take appropriate risks for themselves. Adults may foster the children's awareness of risk by sharing observations, e.g. 'Notice that these rocks are slippery'. They may help them to problem solve by using inquisitive as opposed to directive language e.g. 'What can you use to get across that branch?' In this study participants recognised that children began to decipher for themselves which areas were safe and which areas were not. • Where possible choose a site that facilitates opportunities for risky play. In this study, the FS sites provided trees which were used for climbing on and swinging from. Rocks created a rough terrain that posed challenges and were also used for climbing. Open spaces enabled children to run at speed. Large branches could be moved around the site. • Opportunities to experience explicit risks, including fire and rope work, were linked to feelings of perceived competence in Case 2 and thus are worthy of inclusion where possible. • One of the parents interviewed in Case 1 spoke about the strategy her daughter had learned to address her fear of dogs at FS. Similar strategies may be used in other cases to increase children's ability to regulate emotions such as fear.
Relatedness	• Where staffing allows, teachers may benefit from assuming an observer-participant role during sessions. This can create opportunities for the teacher to see children from a different perspective. • A combination of opportunities for free play and play-based activities facilitated the development of relationships between children.

	• The opportunity to have time alone was valued by some participants in this study. This is a strategy that children may use to mitigate social conflict (Coates & Pimlott-Wilson, 2019) and should be respected.
Nature Connectedness	• The establishment of a base camp and boundaries can create a space within which children are free to explore and discover nature. • Mindful activities, such as the sit-spots used in Case 1, may help draw children's attention to the natural world. Prompts such as 'notice something you can see, something you can hear, something you can feel, something you can smell and something you can touch' incorporate the senses. • Participant's self-reported scores on the CNI reflected findings outlined in the Review Paper which suggested that exposure to nature may help to increase NC, with higher mean scores associated with greater exposure. However, this study did not control for other factors such as family attitudes to nature (Cheng & Munroe, 2012). Although substantially more research is required, this may indicate that the number of sessions has an impact. • The study's findings demonstrated that not all children enjoyed nature. Dogs and getting dirty were two examples of challenges associated with the natural world. Interview responses did suggest that children appeared to adapt to some of these challenges over time. Therefore, extended sessions that give children time to develop a relationship with nature may be important.

4.6 Directions for Future Research

This study aimed to explore the application of SDT and NC as conceptual frameworks to FS practice in Irish primary schools. Previous research has widely demonstrated that experiences of self-determination and nature connectedness are linked to wellbeing (Mayer et al., 2009; R. M. Ryan & Deci, 2000). Future research may include a distinct measure of wellbeing, such as the 'Stirling Children's Wellbeing Scale' (Liddle & Carter, 2015) to examine this link more closely.

The findings of the current study showed that, on the self-report CNI measure, children in Case 1 reported as more connected to nature than children in Case 2. Previous research has demonstrated that NC appears to increase over time if individuals visit nature frequently (Richardson, Cormack, McRobert, & Underhill, 2016). Nature connectedness has also been shown to be stronger in children who have previous experience in nature (Cheng & Monroe, 2012). Although the current study did not control for children's experiences in nature beyond FS, children in Case 1 completed the CNI after 7 weeks of FS while children in Case 2 completed the measure after 3 weeks. As the current study measured NC at a single time-point, future research is needed to establish if FS has the potential to alter this trait and the influence this may have on wellbeing.

The development of a relationship with nature has been associated with enhanced psychological wellbeing (Nisbet et al., 2011; Zelenski & Nisbet, 2014). The wellbeing benefits of nature may offer additional benefits to people experiencing mental illbeing (Shanahan, Fuller, Bush, Lin, & Gaston, 2015). Green exercise, for example, improved self-esteem in people with mental health difficulties to a greater extent than for those without (Barton & Pretty, 2010). Although mental health difficulties did not emerge in the current study, seven out of eight of the teachers and parents interviewed spoke about children with a variety of different needs. Participants commented that FS gave children with specific learning difficulties including dyslexia an opportunity to succeed and demonstrate a different skill set, challenged children with social difficulties to engage in teamwork, enhanced motor skill development over time, and allowed both teachers and peers to see others from a different perspective. Previous research has explored the experience of FS for children with autism (K. Bradley & Male, 2017). Future research may explore any potential impact of FS on children and young people with a broader range of special educational needs, including mental health needs.

4.7 Concluding Remarks

The findings of this study add to a growing body of research on FS. In particular, the study provided an insight into experiences of wellbeing in FS for primary-school children in the Irish context. With increased emphasis on wellbeing promotion within the Irish education system (DES, 2019) and increased access to FS (IFSA, n.d.) the study was timely.

Furthermore, the current study aimed to merge theory and practice by applying a theoretical lens to an under-theorised area of practice. This was achieved through the use of a case study methodology, which enabled the researcher to explore participants' experiences through the lens of SDT and NC. The presented findings indicate that FS aligns with SDT and NC. While this suggests positive effects of FS for wellbeing, more robust research is required to support the findings.

4.8 Impact Statement

This study aimed to expand the theoretical basis of Forest School pedagogy; a form of outdoor education increasingly integrated into the primary school setting. In particular, the researcher sought to explore self-determination theory and nature connectedness as they relate to children's wellbeing within the Forest School context. An explanatory case study approach to data collection was adopted for this research, including observations of Forest School, semi-structured interviews, and the collection of scale data, across two Irish primary school contexts. Findings add to the empirical literature on wellbeing in Forest School, particularly in the Irish context where the research base is notably limited. Furthermore, the study contributes to the development of a theoretical framework for Forest School, thereby addressing one criticism raised in the existing literature.

The findings of case study research are generalisable to theoretical concepts (Yin, 2014). The current study, therefore, extends the application of self-determination theory and nature connectedness to the Forest School context. It is also notable that parallel to this research project a conceptual paper on self-determination theory and Forest School was published (Barrable & Arvanitis, 2019). The authors concluded the paper by calling for empirical research to explore the transfer of theory to practice. The current study contributes to this identified gap in the literature. Furthermore, this study utilised a two-case case study design. The replication of the study across more settings could further enhance our understanding of the relationship between self-determination, nature connectedness, wellbeing, and Forest School by examining the generalisability of the findings.

The review paper of this thesis highlights assertions that exposure to nature represents a source for promoting health and wellbeing which is currently underutilised. The current study extends previous research that suggests that spending time in nature may help children to strengthen their connection to nature (Cheng & Monroe, 2012). Although the study did not control for factors such as time spent in nature outside of Forest School, the pattern of findings indicated high levels of nature connectedness across both cases. This represents an early endeavour into exploring the potential of Forest School in incorporating nature connectedness into mainstream school settings.

The current study is timely in the context of national education policy. The Department of Education and Skills launched a revised 'Wellbeing Policy Statement

and Framework for Practice' in October 2019. The document emphasised the necessity to adopt evidence-based practices in wellbeing promotion within schools. This research project is an example of collaboration between educational psychologists and schools to develop the knowledge base of under-theorised and under-researched practices such as Forest School. Finally, it is intended that the researcher will "communicate their research" (Passenger, 2013, p.26) by disseminating the findings to the schools involved to inform practice at a local level, through the Irish Forest School Association and by submission to Environmental Education Research, a peer-reviewed environmental education journal.

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Appendices

Appendix A Excluded studies with rationale and full reference

Excluded Study	Rationale for Exclusion
Bradshaw, M. (2018). Natural Connections: Forest Schools, Art Education, and Playful Practices. *Art Education, 71*(4), 30-35	7. Outcomes. The focus of this study in on art
Turtle, C., Convery, I., & Convery, K. (2015). Forest Schools and environmental attitudes: A case study of children aged 8–11 years. *Cogent Education, 2*(1)	4. Intervention. The study does not include evidence of multiple sessions
Cumming, F., & Nash, M. (2015). An Australian Perspective of a Forest School: Shaping a Sense of Place to Support Learning. *Journal of Adventure Education and Outdoor Learning, 15*(4), 296-309.	3. Setting. This study is based in a Bush School. Participants do not have access to a Forest School run by a qualified Forest School leader
Mackinder, M. (2017). Footprints in the woods:'tracking' a nursery child through a Forest School session. *Education 3-13, 45*(2), 176-190.	7. Outcomes. This study focuses on planning for Forest School Sessions
Elliot, E., Eycke, K. T., Chan, S., & Müller, U. (2014). Taking Kindergartners Outdoors: Documenting Their Explorations and Assessing the Impact on Their Ecological Awareness	3. Setting. This study is based in an Outdoor Kindergarten. Participants do not have access to a Forest School run by a qualified Forest School leader
Rios, C., & Menezes, I. (2017). "I Saw a Magical Garden with Flowers That People Could Not Damage!": Children's Visions of Nature and of Learning about Nature in and out of School. *Environmental Education Research, 23*(10), 1402-1413.	7. Outcomes. The focus of this study is on environmental attitudes not wellbeing
Elliott, H. (2014). Forest School in an inner city? Making the impossible possible. *Education 3-13, 43*(6), 1-9	7. Outcomes. The focus of this study is on the views on parents and staff towards setting up a Forest School and not wellbeing
Vandewalle, M. (2010). Come Rain or Shine: A Whole School Approach to Forest School. *FORUM: for promoting 3-19 comprehensive education, 52*(1), 43-48.	3.Setting. This study focused on an adaptation of Forest School to meet the ethos and needs of a specific school.
Waite, S., Bølling, M., & Bentsen, P. (2016). Comparing apples and pears?: A conceptual framework for understanding forms of outdoor learning through comparison of English Forest	7. Outcomes. The focus of this study is not on wellbeing but on

Schools and Danish udeskole. ***Environmental Education Research, 22*****(6), 868-892**	comparing Udeskole to Forest School
Savery, A., Cain, T., Garner, J., Jones, T., Kynaston, E., Mould, K., et al. (2017). Does engagement in Forest School influence perceptions of risk, held by children, their parents, and their school staff? ***Education 3-13, 45*****(5), 519-531**	7. Outcomes. The focus of this study is on perceptions of risk not wellbeing
Larimore, R. (2016). Defining Nature-Based Preschools. ***International Journal of Early Childhood Environmental Education, 4*****(1), 32-36**	3. Setting. This study is not based on Forest Schools
Shields, P. (2010). Forest School: Reclaiming It from Scandinavia. ***FORUM: for promoting 3-19 comprehensive education, 52*****(1), 53-60**	7. Type of Study. This study is a review of the history of Forest School
Harwood, D., & Collier, D. R. (2017). The Matter of the Stick: Storying/(Re)Storying Children's Literacies in the Forest. ***Journal of Early Childhood Literacy, 17*****(3), 336-352**	7. Outcomes. The focus of this study is not on wellbeing but on literacy
Harper, N. J. (2017). Outdoor risky play and healthy child development in the shadow of the "risk society": A forest and nature school perspective. ***Child & Youth Services, 38*****(4), 318-334.**	3. Type of Study. This study is not an empirical paper
Waters, J., & Begley, S. (2007). Supporting the Development of Risk-Taking Behaviours in the Early Years: An Exploratory Study. ***Education 3-13, 35*****(4), 365-377**	7. Outcomes. The focus of the study is on risk taking behaviour and not on wellbeing
Connolly, M., & Haughton, C. (2017). The Perception, Management and Performance of Risk Amongst Forest School Educators. ***British Journal of Sociology of Education, 38*****(2), 105-124**	7. Outcomes The focus of the study is on risk management and not on wellbeing
Trotman, H. (2010). Wild Children. ***Primary Science*****(113), 15-18**	6. Outcomes. This was a review of Forest School practice rather than children's, parent's, or practitioner's perspectives
Nawaz, H., & Blackwell, S. (2014). Perceptions about Forest Schools: Encouraging and Promoting Archimedes Forest Schools. ***Educational Research and Reviews, 9*****(15), 498-503**	3. Setting. This study is based on a range of outdoor learning programmes
Waite, S., Davis, B., & Rea, T. (2006). The Special Nature of the Outdoors: Its Contribution to the Education of Children Aged 3-11. ***Australian Journal of Outdoor Education, 10*****(2), 3-12.**	3. Setting. This study is based on a range of outdoor learning programmes
Maynard, T. (2007). Encounters with Forest School and Foucault: A Risky Business? ***Education 3-13, 35*****(4), 379-391**	6. Outcomes. This study focused on tensions between a Forest School

	practitioner and an educator not on wellbeing
Swarbrick, N., Eastwood, G., & Tutton, K. (2004). Self-esteem and successful interaction as part of the Forest School project. *Support for Learning, 19*(3), 142-146	1. Type of Study. This study is an evaluation of a Forest School project
Hayward, J. (2018). Can't See the Wood for the Trees? What Forest School Can Do for Science. *Primary Science*(153)	7. Outcomes. This study focuses on links between Forest School and a science curriculum
Lloyd , A., Son, T., & Gray, T. (2018). Place-based outdoor learning: more than a drag and drop approach. *Journal of Outdoor & Environmental Education, 21*(1), 45-60.	3. Setting. This study is based on place based outdoor learning not Forest School
Morgan, A. (2018). Culturing the fruits of the forest: realising the multifunctional potential of space and place in the context of woodland and/or Forest Schools. *Journal of Outdoor & Environmental Education, 21*(1), 117-130.	7. Outcomes. This study is not an empirical paper
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.	7. Outcomes. This study is not an empirical paper
Murphy, M. C. (2018). 'Exploring the "Construction" strand in the Irish Primary School Visual Arts Curriculum through the Forest School approach'. *Journal of Adventure Education and Outdoor Learning, 18*(3), 257-274.	7. Outcomes. The focus of this study in on art
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. doi:10.1080/14729679.2020.1730206	5. Participants. This study included participants in post-primary as well as primary school
Sharma-Brymer, V., Brymer, E., Gray, T., & Davids, K. (2018). Affordances guiding Forest School practice: the application of the ecological dynamics approach. *Journal of Outdoor & Environmental Education, 21*(1), 103-115.	7. Outcomes. This study is not an empirical study
Smith, M. A., Dunhill, A., & Scott, G. W. (2018). Fostering children's relationship with nature: exploring the potential of Forest School. *Education 3-13, 46*(5), 525. doi:10.1080/03004279.2017.1298644	7. Outcomes. This is not an empirical study
Waite, S., & Goodenough, A. (2018). What is different about Forest School? Creating a space for an alternative pedagogy in England. *Journal of Outdoor & Environmental Education, 21*(1), 25-44.	7. Outcomes. This is not an empirical study
Slade, M., Lowery, C., & Bland, K. (2013). Evaluating the impact of Forest Schools: A collaboration between	7. Outcomes. This study creates a template for future evaluations

a university and a primary school. *Support for Learning, 28*(2), 66-72.	
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 & Care, 188*(7), 980-996.	3. Setting. This study combines Forest School and other Outdoor Education principles

Appendix B Study Characteristics

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
Bradley and Male, 2015	UK	To explore the views of young children with ASD, their parents and educational professionals about their Forest School experience	Children =4, all male Parents = 3, all mothers Educational Professionals =2 (TA's)	Exploratory Study	<u>Parents and Educational Professionals Perspectives</u> -Semi-Structured Interviews -Research Diary kept by one researcher with reflections on the interview process <u>Children's Perspectives</u> -Interview -10-minute video footage	Constant Comparative Approach	<u>Children's Perspectives</u> Main Themes = Friends Challenge and risk-taking Learning outcomes <u>Mother's Perspectives</u> Main Themes = Experiencing success Challenge and risk-taking Learning outcomes

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
					recorded over 4 weeks was used to support the children in answering the questions and providing extended commentary -Field notes of non-verbal behaviour during the interview process -Follow up interview 2 weeks later with questions presented visually and responses elicited through drawing		<u>Educational Professional's Perspectives</u> Main Themes = Experiencing success Challenge and risk-taking Learning outcomes

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
O'Brien and Murray, 2007	UK	To explore the impacts of Forest School on children	N=24	Case study - Participatory Action Research approach	Storyboard – A participative discussion exercise for stakeholders to establish a framework for collecting data Data collection and analysis – use of templates to observe and describe changes in children over time including descriptive observations and interview data from parents and teachers	Reflection Workshops Themes that mapped onto the propositions and themes that did not (Pattern Matching)	The 6 themes proposed through the storyboard exercise were supported across all 3 case studies namely confidence, social skills, language and communication, motivation and concentration, physical skills, knowledge and understanding Two additional themes emerged – new perspectives for teachers and practitioners on children and ripple effects beyond Forest School *Three themes are explored in this paper – Physical Skills, Knowledge and Understanding and Effects beyond Forest School

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
					Reflection poster – participative workshop based on an interactive poster for stakeholders to review the data and share learning experiences and implications for best practice		
O'Brien, 2009	UK	To explore the impacts of Forest School on children	N=24	Case study - Participatory Action Research approach	Storyboard – A participative discussion exercise for stakeholders to establish a framework for collecting data	Reflection Workshops Themes that mapped onto the propositions and themes that did not (Pattern Matching)	Follow up from the previous study exploring different themes; Social Skills, Motivation and Concentration and New Perspectives

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
					Data collection and analysis – use of templates to observe and describe changes in children over time including descriptive observations and interview data from parents and teachers Reflection poster – participative workshop based on an interactive poster for stakeholders to review the		

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
					data and share learning experiences and implications for best practice		
Harris, 2017	UK	To investigate Forest School practitioners' perceptions of learning at a Forest School	N=20 practitioners (Level 3 qualification with experience leading over 40 sessions)	Case Study	Participant observation of 72 children all attending 6 Forest School sessions to inform the research questions for the follow up interviews Semi structured telephone interviews with 20 practitioners	Interviews coded based on themes identified during the pilot study	19 themes emerged coded onto 5 main areas 1. Personal, social, and emotional development 2.Risk and responsibility 3.Styles of learning 4.Topics 5.Connecting with nature

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
Maynard (2007)	UK	To outline and evaluate the key aims, approaches, and ethos of Forest School as they apply to young children	N=3 Forest School Staff	Case Study	Semi-structured interviews Analysis of Bridgewater College Forest School website where the 3 practitioners were trained	Three flows of activity – describing, classifying, and connecting	<u>Main aims of FS</u> 1.Self-esteem 2.Self-confidence 3.Independence 4.Environmental Education <u>Main approaches</u> 1.Risk-taking 2.Play in the natural environment 3.A practical approach 4.Learning styles and schemas <u>Ethos</u> 1.Adult-child relationship
Coates and Pimlott-Wilson, 2019	UK	To examine children's experiences of engaging in a	N = 33 Primary school	Exploratory phenomenological qualitative design	Semi-Structured interviews	Phenomenological Thematic Analysis	Main Themes 1. A break from routine

Author	Country	Research Question/Aim	Participants	Design	Data Collection Methods	Data Analysis	Outcomes
		Forest School compared to the classroom environment	children across 2 schools		Participatory activities – word association task, photographs of school and FS, Drawing task		2. Learning through play 3. Collaboration and Teamwork
Harris, 2018	UK	To determine the significance of being outside on the FS school experience	N= 20 Forest School Practitioners (13 female, 7 male)	Qualitative	Semi-structured Interviews	Thematic Analysis	Main Themes 1.Removal of constraints (freedom) 2.Relaxed 3.Space 4.Facilitation of Learning 5.Seasonal Change 6.Stimulating

Appendix C Weight of Evidence Criteria and Scoring

Weight of Evidence A: Methodological Quality

In order to assess the methodological quality of the studies WoE A was assessed using an adapted version of Brantlinger et al.'s (2005) coding protocol for qualitative research study designs. Brantlinger's (2005) protocol was chosen as it was designed based on the "assertion that qualitative designs do produce science-based evidence that can inform policy and practice in special education" (Brantlinger et al., 2005, p. 195) and this reflected the types of studies being reviewed. The protocol enabled each study to be rated and thus generate Weight of Evidence (WoE) A. Table C1 below provides information on each rated section of the protocol and its criteria.

Table C1

Criteria for Weight of Evidence A

Area	Criteria
Transparency **High (3)** – Meets all 3 criteria **Medium (2)** – Meets 2 of 3 criteria **Low (1)** – Meets 1 of 3 criteria	• Audit trail—keeping track of interviews conducted and/or observations to substantiate that enough time was spent in the field to claim dependable and confirmable results • Prolonged field engagement—Thick, detailed description—reporting enough quotes and field note descriptions to provide evidence for researchers' interpretations and conclusions • Particularisability—documenting cases with thick description so that readers can determine the degree of transferability to their own situations
Accuracy **High (3)** – Meets all 3 criteria **Medium (2)** – Meets 2 of 3 criteria **Low (1)** – Meets 1 of 3 criteria	• Triangulation Evidence of at least one of the following - • Data triangulation—use of varied data sources in a study. • Investigator triangulation—use of several researchers, evaluators, peer debriefers.

	• Theory triangulation—use of multiple perspectives to interpret a single set of data. • Methodological triangulation—use of multiple methods to study a single problem. • Member checks—having participants review and confirm the accuracy (or inaccuracy) of interview transcriptions or observational field notes. OR Collaborative work—involving multiple researchers in designing a study or concurring about conclusions to ensure that analyses and interpretations are not idiosyncratic and/or biased • External auditors—using outsiders (to the research) to examine if, and confirm that, a researcher's inferences are logical and grounded in findings. OR Peer debriefing—having a colleague or someone familiar with phenomena being studied review and provide critical feedback on descriptions, analyses, and interpretations or a study's results
Specificity – Method Specific Quality **Interview Studies** **High (3)** – Meets all 5 criteria **Medium (2)** – Meets 3 - 4 criteria **Low (1)** – Meets 1- 2 criteria	• Interview Studies (or Interview Components of Comprehensive Studies) • Appropriate participants are selected (purposefully identified, effectively recruited, adequate number, representative of population of interest). • Interview questions are reasonable (clearly worded, not leading, appropriate and sufficient for exploring domains of interest). • Adequate mechanisms are used to record and transcribe interviews.

Observation Studies **High (3) –** Meets all 6 criteria **Medium (2) –** Meets 3-5 criteria **Low (1)** – Meets 1-2 criteria	• Participants are represented sensitively and fairly in the report. • Sound measures are used to ensure confidentiality. • <u>Observation Studies</u> (or Observation Components of Comprehensive Studies) • Appropriate setting(s) and/or people are selected for observation. • Sufficient time is spent in the field (number and duration of observations, study time span). • Researcher fits into the site (accepted, respected, unobtrusive). • Research has minimal impact on setting (except for action research, which is purposely designed to have an impact). • Field notes systematically collected (videotaped, audiotaped, written during or soon after observations). • Sound measures are used to ensure confidentiality of participants and settings.
Document Analysis **High (3) –** Meets all 3 criteria **Medium (2) –** Meets 2 of 3 criteria **Low (1) –** Meets 1 of 3 criteria	• <u>Document Analysis</u> • Meaningful documents (texts, artefacts, objects, pictures) are found and their relevance is established. • Documents are obtained and stored in a careful manner. • Documents are sufficiently described and cited. • Sound measures are used to ensure confidentiality of private documents.
Data Analysis **High (3) –** Meets all 6 criteria **Medium (2) –** Meets 3-5 criteria **Low (1) –** Meets 1-2 criteria	• <u>Data Analysis</u> • Results are sorted and coded in a systematic and meaningful way. • Sufficient rationale is provided for what was (or was not) included in the report.

	• Documentation of methods used to establish trustworthiness and credibility are clear. • Reflection about researchers' personal position/perspectives are provided. • Conclusions are substantiated by sufficient quotations from participants, field notes of observations, and evidence of documentation inspection. • Connections are made with related research.

Calculating overall WoE A:

(Transparency score + Accuracy score + Specificity score) / 3

The scoring criteria for WoE A is highlighted below:

High = 2.4 – 3.00

Medium = 1.7 – 2.3

Low = 1.00 – 1.6

Weight of Evidence B: Methodological relevance

Weight of Evidence B refers to the appropriateness of the type of evidence/design of the study to be able to answer this review question. Studies were weighted as having high (3) or promising (2) relevance. The criteria are outlined in Table C2.

Table C2

Criteria for Weight of Evidence B

Weight of Evidence	Criteria
High **Promising**	• <u>Contextual and Demographic Information</u> Studies that include details of a specific Forest School experience (from a child or adult perspective) Studies that give a generic account of Forest School
High **Promising**	• <u>Perceptual Information</u> Includes data on children's experiences (observational or interview) Includes data from practitioners/teachers/parents only
High **Promising**	• <u>Outcomes</u> Uses objective measures or triangulation relating to outcomes (wellbeing) Does not evidence the use of objective measures or triangulation relating to outcomes (wellbeing)

Calculating overall WoE B:

(Contextual Information score + Perceptual Information score + Outcomes score)/3

Overall WoE B scoring criteria:

High = 2.4 – 3.00

Medium = 1.7 – 2.3

Low = 1.00 – 1.6

Weight of Evidence C – Relevance of the evidence to the review question

WoE C was used to judge each of the selected studies in relation to their relevance and appropriateness for answering the review question. The criteria are outlined in Table C3. In order to make this judgement, the reviewer identified the following key features were as being relevant to the review topic:

1) Forest School

2) Connection to Nature

3) Self-Determination Theory

Table C3

Criteria for Weight of Evidence C

Feature	Weight of Evidence	Criteria
Forest School		The six principles of Forest School (IFSA, n.d.) are • Regular Sessions • Woodland Setting • Learner centred processes • Focus on holistic development • Opportunities to take risks • Qualified practitioners
	Strong	• All six criteria are evidenced
	Promising	• 3 – 5 of the criteria are evidenced
	Weak	• Less than 3 of the criteria are evidenced
Connection to Nature	Strong	• Connection to Nature (e.g. enjoyment, empathy, sense of oneness or responsibility)

		emerges as a main theme
	Promising	• Connection to Nature (e.g., enjoyment, empathy, sense of oneness or responsibility) emerges as a minor or sub theme
	Weak	• Connection to Nature (e.g., enjoyment, empathy, sense of oneness or responsibility) are referenced within other themes
Self-determination Theory	Strong	• Autonomy, Competence or Relatedness are identified as a primary theme
	Promising	• Autonomy, Competence or Relatedness are identified as a minor or sub theme
	Weak	• Autonomy, Competence or Relatedness are referenced within other themes

Calculating overall WOE C:

(Forest School score + Autonomy, Competence and Relatedness score + Wellbeing score)/3

Overall WoE C scoring criteria:

High = 2.4 – 3.00

Medium = 1.7 – 2.3

Low = 1.00 – 1.6

Weight of Evidence D

Using the criteria explained above, each study was given a weighting of between 1 and 3 for Weight of evidence A, B and C. The average of these three scores was calculated and corresponds to an overall weight (WoE D) for each study.

Overall WoE D scoring criteria:

High = 2.6 – 3.00 **Medium** = 1.5 – 2.5 **Low** = <1.4

Appendix D Case Selection Protocol

Stage 1	The initial criteria for inclusion are that a block of Forest School sessions, with a Level 3 trained FS leader, will run in an Irish primary school with children between 2nd and 6th Class. Pupils from 2nd to 6th are a suitable age range for completion of the scale data. A list of Forest School leaders is accessible on the Irish Forest School Association Website. Forest School leaders on this list will be contacted by email with an information letter to find potential sites.
Stage 2	The principals of primary schools running Forest School sessions, identified through the process outlined at Stage 1, will be contacted by the researcher, and provided with an information letter.
Stage 3	If a principal provides consent for their school to participate the Forest School leader will be provided with a consent form to ascertain if they consent to take part in the study.
Stage 4	An information letter and consent form will be provided to the class teacher via the school principal to get their consent to participate.
Stage 5	The school principal, Forest School leader and class teacher will all need to consent to participate in the study before the case is selected.

Appendix E Brief Pen Portraits of Cases

Case 1

School 1 is a multi-denominational suburban school with over 230 pupils and 13 teachers. The school has a well-established Forest School programme, with children accessing a 9-week block of half day sessions every other year, starting in Senior Infants. The programme is coordinated by Jane, a special education teacher in the school who is a trained Forest School leader. A second Forest School leader, Emmy, is engaged to co-facilitate the programme. She is an artist engaged with the school through a 'Creativity in the Classroom' project funded by the local authority.

Second-class children were included in this study. The class was divided into three groups, with a ratio of one leader and one support adult to ten children. Support adults included a parent volunteer, a special education teacher and a special needs assistant. As one group worked with their class teacher, not a trained Forest School leader, the ten participants from this group were excluded from the current study. The three observations were of the same group, with the second Forest School leader. A special education teacher (SET) working in the school was the support adult with the group.

The sessions took place between April and June 2019. The Forest School site is an area in a local public park, about one kilometre from the school. The children were dropped to and collected from the site by parent volunteers. As the children have four cycles of Forest School during their time in the school each cycle, or set of sessions, follows a theme. The theme of these sessions was birds. The Forest School leaders meet after each session to reflect on the session and to plan for the next week. They provide the class teacher with classroom material relative to the week's session.

Case 2

School 2 is a multi-denominational urban school with approximately 240 pupils and 14 teachers. The school has recently established a Forest School programme, following a pilot project run earlier in 2019. The programme is facilitated by two Forest School leaders, engaged with the school in a voluntary capacity.

Sixth-class children were included in this study. The class was divided into two groups, with a ratio of two leaders to fifteen children. The class teacher attended Forest

School sessions with each group, as a support adult. The three observations included in this study were of the same group, selected at random.

The sessions took place between November and December 2019. The Forest School site is an area in the grounds of a local university site, about half a kilometre from the school. It comprised of a spacious flat grassy area and a small wooded area. The children walked to and from the site. This was the children's first experience of Forest School, although a number appeared to have experience of Scouts. The teacher had been involved in the pilot project so had some previous experience of Forest School. The Forest School leaders meet after each session to reflect on the session and to plan for the next week.

Appendix F Child Conversation Protocol

Prior to commencing the child conversations, children's assent will also be elicited. Assent is conceived as a child's affirmative agreement to participate in the research provided s/he understands to some degree the purpose of the research and the consequences of participating in it.

The researcher will tell the children that she would like to talk to them about Forest School. The researcher will tell the children that she has already talked to/will be talking to the teacher and leader about Forest School. The researcher will tell the children that this is called 'research' and that she will write what they say in a book, called her thesis.

She will show children the recording device and tell them that when you press this button, the device turns on and starts recording and that when you press another button, it turns the recorder off. She will conduct a demonstration of recording for the children and allow them to participate in this process to ensure they understand the concept and allow them to hear themselves.

Children will be told that they do not have to take part in the research if they do not want to. They will be told that if they do take part, they can leave at any time and that it is okay for them to do this. Children will be told that they can say "I'd like to stop" at any stage during the conversations.

The following script will be used for this process:

Hello - my name is Deirdre.

Thank you for volunteering to talk to me about Forest School. I would like to know about what you do in Forest School, what you like about Forest School and what you don't like about Forest School. You can use writing and drawing to help show me what you have been doing over the past few weeks.

I have already talked to your teacher and Forest School Leader about Forest School. I am doing this because I am doing 'research'. 'Research' is where you find out lots about something and then write about it in a book. I will be writing what you say to me in a book called my thesis and I will also be putting some of the writing and pictures in the book. Your name or school will not be written in the book, only what you say, draw and write.

However, you don't have to talk with me if you don't want to. If you want to stop answering questions all you must do is say "I'd like to stop". If you do not want me to use your picture or something you write that is alright too. You can leave at any time and go back to your other work.

I am going to be recording what you say so that I can listen carefully to it again later as what you will say is very important. I have a recorder here to do this. When I press this button on, the recorder is on and when I press this button the recorder is off. We will

see if the recorder is working before we begin. When I press the on button, we can say 'hello' together and I will play it back to you so that you can check if it is working.

Before we start, I would like to be sure that you are happy to start so I brought along a sheet for you to sign for me. I will read the writing and you can sign your name. Remember you don't have to talk to me if you don't want to, so it is alright not to write your name.

Child Conversation Assent Form

My name is _____.

I am going to answer some questions about Forest School.

I know that I can draw pictures and write to help answer questions.

I don't have to answer questions that I don't want to.

I can say 'stop' at any time and I won't get in trouble.

I know that my answers and my drawings might be used in Deirdre's research. My real name will not be used.

Name of Student: _____

Signature:_____

Date:_____

"Write and Draw"

For the next part I would like to know about what you do in Forest School, what is important at Forest School, what you like about Forest School and what you do not like about Forest School. You can use writing and drawing to help show me what you have been doing over the past few weeks.

[Child is provided with paper, a pencil and coloured pencils]

-Time is allowed for child to complete their drawing.

-Rather than provide feedback as the child is drawing the researcher may ask; "What is going on in your picture?" "Tell me about this…"

-With the child's permission the researcher may make written labels to assist with interpretation of the interview script

"Tell"

- Can you tell me a bit about Forest School?
- Would you like to show me some of the important things you put in your picture of Forest School?
    - What is this?
    - What is happening here?
    - Why was this important to you?
    - Can you tell me more about this?
    - What are you doing? (If the child is in the picture)
    - What are the children doing? (If there are other children in the picture)
    - What are the adults doing? (If there are adults in the picture)
- Is Forest School different to learning in the classroom?
    - In what way?
- Can you tell me what learning outdoors is like?
- How do you feel when you are at Forest School?
    - What do you think makes you feel _____?
    - Is there anything you like about Forest School?
    - Is there anything you do not like about Forest School?
- Is there anything else you would like to tell me about Forest School before we finish?

Afterwards *- Thank you very much for helping me with my research and telling me all about what you do in Forest School. Thank you too for all the lovely drawings, which I will keep and put some of them in my thesis that I was telling you about earlier.*

Appendix G Semi Structured Interview Questions

Participant - Forest School Leader

- Can I ask you to start by briefly describing how Forest School is provided in this context?
    - Frequency
    - Location
    - Planning
    - Challenges
- From your perspective as the facilitator, what are your main aims for the Forest School sessions?
    - Do they align with the six principles of the Irish Forest School Association?
    - Are the leaders qualified?
    - Are there regular sessions?
    - Is it in a woodland setting?
- Are there ways in which the children lead the process?
- Are there opportunities for the children to experience success?
    - Are there opportunities to take risks?
    - Are there particular areas of development or skills that are focused on?
- Are there opportunities for the children to develop relationships?
    - Relationships with themselves?
    - Relationships with others?
    - Relationships with the natural world?
- How do you feel that children respond to the outdoor environment and the Forest School experience?
- Is there anything else you feel is important or would like to add before we finish?

Participant – Teacher

- How did you become involved in Forest School?
    - Is this the first time a class you have taught has engaged in Forest School?
    - What is your role during the Forest School sessions?
- In your experience of Forest School so far, what do you see as the opportunities for learning that it offers?
    - If wellbeing is mentioned but not elaborated on the teacher will be asked if they can elaborate on this
    - Do these opportunities differ in any way to the classroom?
- In your experience of Forest School do you feel the children get opportunities to direct their own learning?
    - If necessary ‘direct their own learning’ will be clarified as ‘make decisions about their learning during Forest School’

    - Can you think of any examples? / In what way?
- In your experience of Forest School do the children get opportunities to make progress and experience a sense of achievement?
    - If necessary ‘a sense of achievement’ will be clarified as ‘feelings of success’
    - Can you think of any examples? /In what way?
- In your experience do the children develop relationships during Forest School?
    - Can you think of any examples? /In what way?
- How do you feel that children respond to the outdoor environment?

- Is there anything else you feel is important or would like to add before we finish?

<u>Participant – Parent</u>

- Can I ask you to tell me a bit about your experience of Forest School as a parent?
    - What is your understanding of what your child does at Forest School?
    - Does your child tell you about Forest School?
    - Have you been to any Forest School sessions?
- How do you feel about Forest School being part of your child’s experience at school?
    - Are there any benefits that you have seen?
    - Are there any challenges that you have encountered?
- As a parent do you feel Forest School offers different learning opportunities to the classroom?
    - Can you think of any examples? /In what way?
- How do you feel about your child having regular opportunities for learning outdoors?
- How do you think your child feels about Forest School?
    - If wellbeing is mentioned and have not yet been elaborated on the parent will be asked if they can elaborate on this
- Is there anything else you feel is important or would like to add before we finish?

Appendix H Scale Measures

Based on the aims of the study and following a pilot of the scale with children attending private Forest School sessions (n=3) the following adaptations were made to the Basic Psychological Needs Satisfaction Scale:

- All 21 items were reworded to include ‘Forest School’
- The original scale ranged from ‘Not at all true’ to ‘Definitely true’. This was adapted to maintain consistency with the Connection to Nature Index. The adapted scale ranged from ‘Strongly disagree’ to ‘Strongly agree’.
- The word ‘not’ was removed from 6 items to minimise confusion and therefore these items did not have to be reverse scored. This reduced the number of items to be reverse scored from 9 items to 3 items.

Thank you for helping me with my project

Soon you will get to answer some questions about Nature and Forest School

First, can you write your

Age: I am _____years old

Gender: _____

This is what the questions on the next page will look like					
	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
Being in the forest is fun					
I enjoy being outdoors					

Now we are ready to start

Statements:	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
I like to hear different sounds in nature					
I like to see wild flowers in nature					
When I feel sad, I like to go outside and enjoy nature					
Being in the natural environment makes me feel peaceful					
I like to garden					
Collecting rocks and shells is fun					
I feel sad when wild animals are hurt					
I like to see wild animals living in a clean environment					
I enjoy touching animals and plants					
Taking care of animals is important to me					
Humans are part of the natural world					
People cannot live without plants and animals					
Being outdoors makes me happy					
My actions will make the natural world different					
Picking up trash on the ground can help the environment					
People do not have the right to change the natural environment					

Soon you will get to answer some questions about Forest School

These questions will look like this

1) Forest school is fun						
1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

2) I enjoy going to Forest School.						
1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

Now we are ready to start

1) I feel like I am free to decide for myself how I do things at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

2) I really like the people I interact with at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

3) I often feel good at doing things at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

4) I feel pressured during Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

5) People at Forest School tell me I am good at what I do.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

6) I get along with people at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

7) I pretty much keep to myself when I am at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

8) I can tell people my ideas and opinions at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

9) The other people at Forest School are my friends.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

10) I have been able to learn interesting new skills at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

11) At Forest School I often have to do what I am told.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

12) People at Forest School care about me.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

13) I feel a sense of achievement from what I do at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

14) People at Forest School tend to take my feelings into consideration.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

15) At Forest School I get a chance to show how well able I am.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

16) There are many people that I am close to at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

17) I feel like I can pretty much be myself when I am at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

18) The people I interact with at Forest School seem to like me.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

19) I often feel well able to do things at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

20) There are many chances for me to decide for myself how to do things at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

21) People are generally pretty friendly towards me at Forest School.

1 Strongly disagree	2	3	4 Neither agree nor disagree	5	6	7 Strongly agree

Appendix I Case Study Protocol

A case study protocol acts as a structured guideline for both the investigator and the intended audience of the final report (Yin, 2009).

The case study protocol for this project is in accordance with Yin's guidelines (2009, p. 80)

Section	Activity
A. Introduction to the Case Study and Purpose of Protocol	
1. Case study questions, hypotheses, and propositions	Three research questions (RQs) are to be answered in this study: RQ 1: What is happening during Forest School sessions? RQ 2: Can children's experiences be understood by self-determination theory? RQ 3: Can children's experiences be understood by nature connectedness? The study hypothesises that being outdoors, a social constructivist pedagogy and opportunities to take risks will lead to heightened perceptions of autonomy, competence, relatedness, and connection to nature. Four theoretical propositions were drawn up based on self-determination theory and nature connectedness; 1. Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School. 2. Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School. 3. Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School. 4. There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School.
2. Theoretical framework for the case study	The current research is conducted through the theoretical lens of self-determination theory and nature connectedness. The propositions for the study are based on two theories, self-determination theory and nature connectedness. The concepts within these theories were analysed in accordance with Forest School principles. Propositions 1 - 3, outlined above, each relate to different aspects of self-determination theory. According to self-determination theory it is

	satisfaction of autonomy, competence and relatedness as a whole that is necessary for enhanced wellbeing. Under this conceptual framework the extent to which all three propositions are supported needs to be considered. Proposition 4 relates to nature connectedness. As nature connectedness refers to a subjective sense of one's connection with nature it is hypothesised that there will be variability in the extent to which children feel connected to nature.
3. Role of protocol in guiding the case study investigator	The protocol is a standardised agenda for the investigators line of enquiry (Yin, 2009, p. 80). A case study protocol guides the data collection. It is particularly important for a project with a multiple-case design as it enables the investigator to replicate a standardised procedure across cases, increasing reliability (Yin, 2009).
B. Data Collection Procedures	
1. Names of sites to be visited, including contact persons	Schools 1 and 2 and their respective principals and Forest School leaders
2. Data Collection Plan	a. March 2019: Forest School leaders and school principals were emailed information about the project b. April 2019: Pilot Study -Observe Forest School Session -Revise Field Note Recording Template -Revise Forest School Leader Semi-Structured Interview Schedule -Pilot the adapted Basic Psychological Need Satisfaction in Forest School scale with 3 children attending FS sessions in a private capacity c. May/June 2019: School 1 - Information Letters and Consent Forms Distributed -Day 1: •Observation of Forest School Session •Field notes - documented what happened during the session -Day 2: • Child Conversation – 'Draw Write Tell' activity x2 • Observation of Forest School Session • Field notes • Semi-structured interview with Forest School Leader(s) -Day 3: • Scales - Basic Psychological Need Satisfaction Scale and Connection to Nature Index distributed to all children with parent consent and child assent • Observation of Forest School Session • Field notes

	• Semi-structured interview with Class Teacher • Semi-structured interview with SET (*Only School 1) -Day 4: • Semi-structured interview with a parent X2 d. November/December 2019: School 2 - Information Letters and Consent Forms Distributed -The data collection plan for School 1 was replicated for School 2
3. Expected preparation prior to site visit	-Print information letters and consent/assent sheets -Distribute and collect signed informed consent/assent forms -Purchase a researcher journal to take on-site field notes and a reflective diary to document researcher reflections on interviews and observation sessions -Prepare template to document on-site field notes after each session -Print scales, interview schedules and interview protocol -Source recording device for recording interviews

C. Outline of Case Study Report

The following is an outline of the structure of the case study report:

1. Overview of the report to guide the reader

2. Outline the results for Research Question 1
   a. Field notes for 3 observation sessions compared against five principles of Forest School
   b. Forest School leader interview responses compared against five principles of Forest School
   c. Excerpts from the researcher's diary relevant to the five principles

3. Outline the results for Research Question 2, related to self-determination theory, by elucidating the findings for Proposition 1 (autonomy), Proposition 2 (competence) and Proposition 3 (relatedness)
   a. Correlation between autonomy, competence or relatedness and the brief 2 item measure of intrinsic motivation (Findings for Case 1 and Case 2)
   b. Pattern-matching of interview responses (Findings for both cases presented together)
   c. Thematic analysis of interview responses (Findings for both cases presented together)

4. Outline the results for Research Question 3, related to nature connectedness, by elucidating the findings for Proposition 4 (Nature Connectedness)
   a. Mean Connection to Nature Index score (Findings for Case 1 and Case 2)
   b. Pattern-matching of interview responses (Findings for both cases presented together)

c. Thematic analysis of interview responses (Findings for both cases presented together)

5. Cross-case analysis and discussion
6. Conclusions and directions for future research

D. Case Study Questions

- How are Irish Primary Schools in this study facilitating Forest School sessions?
    - Sources of Evidence: Observations/Field Notes; Semi-Structured Interview with Forest School Leader; Researcher's Diary
- What is happening during the Forest School sessions?
    - Sources of Evidence: Observations/Field Notes; Semi-Structured Interview with Forest School Leader; Researcher's Diary
- Are the Forest School sessions adhering to the six principles as outlined by the Irish Forest School Association?
    - Sources of Evidence: Observations/Field Notes (Field Note Recording Template based on the six principles) and Semi-Structured Interview with Forest School Leader
- Do Forest School Leaders consider opportunities for autonomy, relatedness and competence when planning Forest School sessions?
    - Semi-Structured Interview with Forest School Leader
- Do children, their teachers and their parents perceive that Forest School sessions provide opportunities to experience autonomy?
    - Sources of Evidence: Autonomy subscale of the Basic Needs Scale (Adapted for Forest School), Child Conversations, Semi-Structured interviews with teachers and parents
- Do children, their teachers and their parents perceive that Forest School sessions provide opportunities to experience relatedness?
    - Sources of Evidence: Relatedness subscale of the Basic Needs Scale (Adapted for Forest School), Child Conversations, Semi-Structured interviews with teachers and parents,
- Do children, their teachers and their parents perceive that Forest School sessions provide opportunities to experience competence?
    - Sources of Evidence: Competence subscale of the Basic Needs Scale (Adapted for Forest School), Child Conversations, Semi-Structured interviews with teachers and parents
- To what extent are all three basic needs met during Forest School sessions in each school?
    - Sources of Evidence: Basic Need Satisfaction Scale (Adapted for Forest School), Child Conversations, Semi-Structured interviews with teachers and parents
- Do children, their parents and teachers perceive the being outdoors in the Forest School environment develops children's relationship with nature?
    - Sources of Evidence: Connection to Nature Index, Child Conversations, Semi-Structured interviews with teachers and parents

Appendix J Research Ethics

Mary Immaculate College Research Ethics Committee

MIREC-4: MIREC Chair Decision Form

APPLICATION NO. A19-006 FINAL

1. PROJECT TITLE

An exploration of psychological wellbeing in Irish Forest Schools

2. APPLICANT

Name:	Deirdre Egan
Department / Centre / Other:	Educational Psychology, Inclusive and Special Education
Position:	Postgraduate Researcher

3. DECISION OF MIREC CHAIR

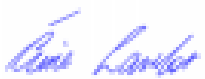
	Ethical clearance through MIREC is required.
	Ethical clearance through MIREC is not required and therefore the researcher need take no further action in this regard.
✓	Ethical clearance is required and granted. Referral to MIREC is not necessary.
	Ethical clearance is required but the full MIREC process is not. Ethical clearance is therefore granted if required for external funding applications and the researcher need take no further action in this regard.
	Insufficient information provided by applicant / Amendments required.

4. REASON(S) FOR DECISION

A19-006 – Deirdre Egan - *An exploration of psychological wellbeing in Irish Forest Schools*

I have reviewed this application and I believe it satisfies MIREC requirements and is therefore approved.

5. DECLARATION (MIREC CHAIR)

Name (Print):	Dr Áine Lawlor
Signature:	
Date:	18th February 2019

Appendix K School Principal Information Sheet

An exploration of psychological wellbeing in Irish Forest Schools

What is the project about?

Increasing numbers of preschools and primary schools across Ireland are providing children with access to Forest School as part of their educational experience. This research will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing. The study will focus on factors that might influence psychological wellbeing in this context; the physical environment, the activities, interactions with others, opportunities to take risk and being outdoors.

Who is undertaking it?

My name is Deirdre Egan and I am a Postgraduate student attending Mary Immaculate College. I am presently completing a Doctorate in Educational and Child Psychology in the Department of Educational Psychology, Inclusive and Special Education under the supervision of Dr. Therese Brophy and Dr. Suzanne Egan. The current study will form part of my thesis.

Why is it being undertaken?

The aim of the study is to explore the impact on psychological wellbeing of children who have access to Irish Forest Schools. The study aims to clarify how the natural environment, the activities, the social elements or other factors contribute to the children's experience.

What are the benefits of this research?

It is hoped that the data gathered from participants (a) will help us to understand the experience of Forest School in Ireland, (b) will help us to understand if and why Forest School is beneficial for young people and (c) might help us to adapt the way Forest School is run to benefit young people and their wellbeing

Exactly what is involved for the participant (time, location, etc.)

The researcher proposes to visit your school to engage in observations and interviews with children and staff involved in Forest School. The researcher will observe approximately three Forest School sessions in action. Observations will focus on children within the group who have given their assent to participate and whose parents/guardians have provided consent. Field notes will be recorded by the researcher during observations.

All children who have consent to participate in the study will be asked to complete two questionnaires. One focuses on 'self-determination' which refers to children's opportunities to experience competence, relationships with others and opportunities to make decisions for themselves during Forest School. The other questionnaire will explore how connected they feel to nature. A semi-structured interview will be conducted with the class teacher and Forest School leader. Child conversations will be

conducted with two children asking them about their experience of Forest School. During these conversations they will be given the opportunity to draw a picture of Forest School as a means of facilitating the conversation. Parents will be asked if they provide consent for a brief phone interview about their experience of Forest School. It is proposed that two parents who wish to provide their phone number will be interviewed.

If you provide consent for your school to be involved in the research project, I would be grateful if you would sign the attached form.

Right to withdraw

All data will be stored anonymously, and staff, parents and children are free to withdraw from the study at any time without giving a reason and without consequence.

How will the information be used / disseminated?

The data from your school will be analysed and will form the results section of my thesis. Data from a similar setting will also be included in this analysis for case comparison purposes. It may be used in related publications and presentations arising from this research.

How will confidentiality be kept?

All information gathered will remain confidential and will only be accessed by the principal investigator and supervisors. Anonymised data will be accessed by a second coder. Excerpts from data collected during the research process, including drawings, will be used in the final written document but under no circumstances will names or identifying characteristics be included.

What will happen to the data after research has been completed?

In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely.

Contact details:

If at any time you have any queries / issues with regard to this study, my contact details are as follows:

[----------]

If you have concerns about this study and wish to contact someone independent, you may contact:

MIREC Administrator,
Research and Graduate School,
Mary Immaculate College,
South Circular Road,
Limerick.
Telephone: 061-204980 / E-mail: mirec@mic.ul.ie

Appendix L School Principal Informed Consent Form

Dear Principal,

As outlined in the participant information letter the current study will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing.
Details of what the study involves are contained in the participant information letter. This should be read fully and carefully before consenting to take part in the study.
The data collected will be anonymised for storage. Participants are free to withdraw from the study at any time. All information gathered will be used for the purpose of the research study and will not be released to any third party. In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely.

Please tick that you have read the following statements before signing the consent form.
• I have read and understood the participant information letter. ☐
• I understand what the project is about, and what the data will be used for. ☐
• I am fully aware of all of the procedures involved, and of any risks and benefits associated with the study. ☐
• I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason. ☐
• I am aware that reasonable efforts will be made to keep the data confidential. ☐

Participants and school names will not be included. The data will be used for publications and presentations related to the research topic.

School: _____
Name (PRINTED): _____
Name (Signature): _____
Date: _____

Appendix M Teacher Information Sheet

An exploration of psychological wellbeing in Irish Forest Schools

What is the project about?

Increasing numbers of preschools and primary schools across Ireland are providing children with access to Forest School as part of their educational experience. This research will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing. The study will focus on factors that might influence psychological wellbeing in this context; the physical environment, the activities, interactions with others, opportunities to take risk and being outdoors.

Who is undertaking it?

My name is Deirdre Egan and I am a Postgraduate student attending Mary Immaculate College. I am presently completing a Doctorate in Educational and Child Psychology in the Department of Educational Psychology, Inclusive and Special Education under the supervision of Dr. Therese Brophy and Dr. Suzanne Egan. The current study will form part of my thesis.

Why is it being undertaken?

The aim of the study is to explore the impact on psychological wellbeing of children who have access to Irish Forest Schools. The study aims to clarify how the natural environment, the activities, the social elements or other factors contribute to the children's experience.

What are the benefits of this research?

It is hoped that the data gathered from participants (a) will help us to understand the experience of Forest School in Ireland, (b) will help us to understand if and why Forest School is beneficial for young people and (c) might help us to adapt the way Forest School is run to benefit young people and their wellbeing

Exactly what is involved for the participant (time, location, etc.)

The researcher proposes to observe approximately three Forest School sessions in action. Observations will focus on children within the group who have given their assent to participate and whose parents/guardians have provided consent. Field notes will be recorded by the researcher during observations. The researcher proposes to conduct a semi-structured interview with you and the Forest School leader. Interviews will be recorded for transcription.

During one visit all children who have consent to participate in the study will be asked to complete two questionnaires. One focuses on 'self-determination' which refers to children's opportunities to experience competence, relationships with others and opportunities to make decisions for themselves during Forest School. The other questionnaire will explore how connected they feel to nature. Following the final visit, the researcher proposes to conduct a semi-structured interview with you and the Forest

School leader. Child conversations will be conducted with two children asking them about their experience of Forest School. During these conversations they will be given the opportunity to draw a picture of Forest School as a means of facilitating the conversation.

Parents will be asked if they provide consent for a brief phone interview about their experience of Forest School. It is proposed that two parents who wish to provide their phone number will be interviewed.

If you provide consent for to be involved in the research project, I would be grateful if you would sign the attached form.

Right to withdraw

All data will be stored anonymously, and staff, parents and children are free to withdraw from the study at any time without giving a reason and without consequence.

How will the information be used / disseminated?

The data from your school will be analysed and will form the results section of my thesis. Data from a similar setting will also be included in this analysis for case comparison purposes. It may be used in related publications and presentations arising from this research.

How will confidentiality be kept?

All information gathered will remain confidential and will only be accessed by the principal investigator and supervisors. Anonymised data will be accessed by a second coder. Excerpts from data collected during the research process, including drawings, will be used in the final written document but under no circumstances will names or identifying characteristics be included.

What will happen to the data after research has been completed?

In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely.

Contact details:

If at any time you have any queries / issues with regard to this study, my contact details are as follows:

[----------]

If you have concerns about this study and wish to contact someone independent, you may contact:

MIREC Administrator,
Research and Graduate School,
Mary Immaculate College,
South Circular Road, Limerick.
Telephone: 061-204980 / E-mail: mirec@mic.ul.ie

Appendix N Forest School Leader Information Sheet

An exploration of psychological wellbeing in Irish Forest Schools

What is the project about?

Increasing numbers of preschools and primary schools across Ireland are providing children with access to Forest School as part of their educational experience. This research will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing. The study will focus on factors that might influence psychological wellbeing in this context; the physical environment, the activities, interactions with others, opportunities to take risk and being outdoors.

Who is undertaking it?

My name is Deirdre Egan and I am a Postgraduate student attending Mary Immaculate College. I am presently completing a Doctorate in Educational and Child Psychology in the Department of Educational Psychology, Inclusive and Special Education under the supervision of Dr. Therese Brophy and Dr. Suzanne Egan. The current study will form part of my thesis.

Why is it being undertaken?

The aim of the study is to explore the impact on psychological wellbeing of children who have access to Irish Forest Schools. The study aims to clarify how the natural environment, the activities, the social elements or other factors contribute to the children's experience.

What are the benefits of this research?

It is hoped that the data gathered from participants (a) will help us to understand the experience of Forest School in Ireland, (b) will help us to understand if and why Forest School is beneficial for young people and (c) might help us to adapt the way Forest School is run to benefit young people and their wellbeing

Exactly what is involved for the participant (time, location, etc.)

The researcher proposes to observe approximately three Forest School sessions in action. Observations will focus on children within the group who have given their assent to participate and whose parents/guardians have provided consent. Field notes will be recorded by the researcher during observations. The researcher proposes to conduct a semi-structured interview with you and the class teacher. Interviews will be recorded for transcription.

During one visit all children who have consent to participate in the study will be asked to complete two questionnaires. One focuses on 'self-determination' which refers to children's opportunities to experience competence, relationships with others and opportunities to make decisions for themselves during Forest School. The other questionnaire will explore how connected they feel to nature. Following the final visit, the researcher proposes to conduct a semi-structured interview with you and the class teacher. Interviews will be recorded for transcription. Child conversations will be conducted with two children asking them about their experience of Forest School.

During these conversations they will be given the opportunity to draw a picture of Forest School as a means of facilitating the conversation.
Parents will be asked if they provide consent for a brief phone interview about their experience of Forest School. It is proposed that two parents who wish to provide their phone number will be interviewed.

If you provide consent for to be involved in the research project, I would be grateful if you would sign the attached form.

Right to withdraw
All data will be stored anonymously, and staff, parents and children are free to withdraw from the study at any time without giving a reason and without consequence.

How will the information be used / disseminated?
The data from your school will be analysed and will form the results section of my thesis. Data from a similar setting will also be included in this analysis for case comparison purposes. It may be used in related publications and presentations arising from this research.

How will confidentiality be kept?
All information gathered will remain confidential and will only be accessed by the principal investigator and supervisors. Anonymised data will be accessed by a second coder. Excerpts from data collected during the research process, including drawings, will be used in the final written document but under no circumstances will names or identifying characteristics be included.

What will happen to the data after research has been completed?
In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely

Contact details:
If at any time you have any queries / issues with regard to this study, my contact details are as follows:
[----------]
If you have concerns about this study and wish to contact someone independent, you may contact:
MIREC Administrator,
Research and Graduate School,
Mary Immaculate College,
South Circular Road, Limerick.
Telephone: 061-204980 / E-mail: mirec@mic.ul.ie

Appendix O Teacher/Forest School Leader Informed Consent Form

Dear Participant,
As outlined in the participant information letter the current study will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing.
Details of what the study involves are contained in the participant information letter. This should be read fully and carefully before consenting to take part in the study.
The data collected will be anonymised for storage. Participants are free to withdraw from the study at any time. All information gathered will be used for the purpose of the research study and will not be released to any third party. In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely.

Please tick that you have read the following statements before signing the consent form.
• I have read and understood the participant information letter. ☐
• I understand what the project is about, and what the data will be used for. ☐
• I am fully aware of all of the procedures involved, and of any risks and benefits associated with the study. ☐
• I know that my participation is voluntary and that I can withdraw from the project at any stage without giving any reason. ☐
• I am aware that reasonable efforts will be made to keep the data confidential. ☐
Participants and school names will not be included. The data will be used for publications and presentations related to the research topic.

School: _____
Name (PRINTED): _____
Name (Signature): _____
Date: _____

Appendix P Parent/Guardian Information Sheet

An exploration of psychological wellbeing in Irish Forest Schools

What is the project about?

Increasing numbers of preschools and primary schools across Ireland are providing children with access to Forest School as part of their educational experience. This research will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing. The study will focus on factors that might influence psychological wellbeing in this context; the physical environment, the activities, interactions with others, opportunities to take risk and being outdoors.

Who is undertaking it?

My name is Deirdre Egan and I am a Postgraduate student attending Mary Immaculate College. I am presently completing a Doctorate in Educational and Child Psychology in the Department of Educational Psychology, Inclusive and Special Education under the supervision of Dr. Therese Brophy and Dr. Suzanne Egan. The current study will form part of my thesis.

Why is it being undertaken?

The aim of the study is to explore the impact on psychological wellbeing of children who have access to Irish Forest Schools. The study aims to clarify how the natural environment, the activities, the social elements or other factors contribute to the children's experience.

What are the benefits of this research?

It is hoped that the data gathered from participants (a) will help us to understand the experience of Forest School in Ireland, (b) will help us to understand if and why Forest School is beneficial for young people and (c) might help us to adapt the way Forest School is run to benefit young people and their wellbeing

Exactly what is involved for the participant (time, location, etc.)

The study, which your child's school has kindly agreed to participate in, will involve observation of Forest School sessions. Interviews will be with conducted with their teacher and Forest School leader. At the end of the block of observation the researcher will have a conversation with a small number of children. This will include the children drawing a picture to guide the conversation. Children will also be asked to complete brief questionnaires exploring motivation and connectedness to nature.

The researcher hopes to conduct a phone interview with some parents about Forest School. These interviews can take place at a time that suits you and will last approximately 15 minutes. If you are willing to participate in this aspect of the study, there is a space on the consent form to provide your phone number.

If you provide consent for anonymised observations of your child to be included in written format and for your child to participate in the child conversations, should they wish to do so, I would be grateful if you would sign the attached form providing consent for your child to participate in the research. If you provide consent to be contacted for a phone interview, please tick the relevant box.

Right to withdraw

Your anonymity and you child's anonymity are assured, and they are free to withdraw from the study at any time without giving a reason and without consequence.

How will the information be used / disseminated?

The information provided by you and your child will be combined with that of the other participants in this study and used to form the results section of my thesis. The thesis may be used in publications and presentations on the same topic.

How will confidentiality be kept?

All information gathered will remain confidential and will only be accessed by the principal investigator. The researcher supervisors and a second coder will have access to the data only when it is anonymised. Excerpts from data collected during the research process may be used in the final written document but under no circumstances will names or identifying characteristics be included.

What will happen to the data after research has been completed?

In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely

Contact details:

If at any time you have any queries / issues with regard to this study, my contact details are as follows:

[----------]

If you have concerns about this study and wish to contact someone independent, you may contact:

MIREC Administrator,
Research and Graduate School,
Mary Immaculate College,
South Circular Road,
Limerick.
Telephone: 061-204980 / E-mail: mirec@mic.ul.ie

Appendix Q Parent/Guardian Informed Consent Form

Dear Parent/Guardian,

As outlined in the participant information letter the current study will explore if offering opportunities for children to learn outside the classroom, through Forest School, impacts on their wellbeing.

Details of what the study involves are contained in the participant information letter. This should be read fully and carefully before consenting to your child taking part in the study. All children with parental consent to participate will also be given the opportunity to provide their own assent.

Data collected will be anonymised and participants are free to withdraw from the study at any time. All information gathered will be used for the purpose of the research study and will not be released to any third party. In accordance with MIC Data Retention Policy, anonymised data may be retained indefinitely.

Please tick that you have read the following statements before signing the consent form.

- I have read and understood the participant information letter. ☐
- I understand what the project is about, and what the data will be used for. ☐
- I am fully aware of all aspects of the study, and of any risks and benefits associated with the study. ☐
- I know that my participation and/or my child's participation is voluntary and that we can withdraw from the project at any stage without giving any reason. ☐
- I am aware that reasonable efforts will be made to keep the data confidential. ☐

Participants and school names will not be included. The data will be used for publications and presentations related to the research topic.

I consent for my child to take part in this research study ☐

Child's Name (PRINTED): _____

Parent's Name (PRINTED): _____

Name (Signature): _____

Date: _____

If you consent to a Parent Phone Interview, please provide a phone number at which you can be contacted: _____

Appendix R Child Information Sheet

Forest School

What is the project about?

I am doing a project for my University work. It's like a project you might do in school. I am learning about Forest Schools.

Who am I?

My name is Deirdre Egan and I am a student in Mary Immaculate College. I am training to be an Educational Psychologist. An Educational Psychologist is a person who works with children and their schools and families to help them make learning better. The project I am doing will form part of my thesis, which is where I write about something that I am really interested in, like Forest School.

Why am I doing this project?

I am doing this project to see what Forest School is like for children in Ireland. I want to find out what you do in Forest School and how it makes you feel. I hope that other people will read what I write and learn more about Forest School.

What will have to do if you want to take part?

I would like to spend some time in Forest School looking at what you do there. I will write down some notes to help me remember what I see. I won't write your real name in my notes, so people won't know who they are about. In a few weeks I will ask some people to draw a picture of Forest School and tell me about it. I might ask if I can use some of the things you have said or drawn in my project. On one day I will also ask you to answer some questions on a page.

What if I don't want to take part anymore?

If you want to stop taking part in the project you can tell me, your parents or your teachers. You do not have to explain why you want to stop. If you have any worries about what is going on or have any questions you can come talk to me or to your teacher or parents. However, I cannot promise what you tell us can be kept a secret.

Appendix S Child Assent Form

Forest School

My name is _____.

I am going to let the researcher write down some notes about what I am doing at Forest School. I know that if I change my mind, I can say I would like to stop, and I won't get in trouble. ☐

The researcher will put the names of the people who tick this box in a raffle and pick some people to talk to her about Forest School. I would like to be on the list of people who might talk to the researcher about Forest School. This means that I might do some drawings that could be put in the project. ☐

Signed: _____

Date: _____

Appendix T Field Notes

Case 1 Observation Session 1

Session Overview

- Gathered at the carpark
- Free Play
- Each leader used their groups call to gather their group into a circle
- Walk to the base camp, stopped to pick leaves for tea
- Circle Time – discussion on what they might do for the session – not definitive
- Game – Eagle Eye
- Circle for Lunch and a Story
- Free Play (Box of materials and tools)
- Focus – Finishing woodland bird name necklaces that had been started the previous session – each child took a woodland bird name, lots of rhyming, alliteration and even a link to the Irish version of a child's name in their choices
- Sit Spot and Gratitude Circle
- Walk back to the carpark

Notes

-Journey from carpark to base camp involved looking for leaves to make tea

-FSL asked for help to carry baskets – noticed how enthusiastic children were about helping – and determined not to give up on their responsibility even when I offered to take a turn

-C suggested using elderflower – went and checked out the tree – FSL asked lots of questions rather than tell the children it's not an elder tree– what does it look like? Feel like? Smell like? – turns out it wasn't elder it was rowan

-Elder will flower in a few weeks – nature-based information

-Wild cherry blossoms – FSL described them as summer snowflakes

-FSL - 'Let's see if there is anything different for the tea?'

-Everybody was with the group but did not appear to have to do the same thing – no checking are you listening, did you hear that etc.

-FSL "Keep together so that we can see what you can see"

-Plan changed to nettle tea – some children and FSL modelled how you can pick nettles without getting stung

-Some children were hesitant at first and then got a bit braver, some decided against it, some had no fear and didn't appear too bothered about getting stung either!!

-Children were aware of dock leaves as an antidote and started to search for them…told me that where nettles grow so do docks – natures medicine – and some children began to collect docs in case we needed them at base camp

-On the way to base camp one of the children was observed to hold back a branch so that all the others could pass

-Stopped under a Beech tree to feel the softness of the new leaves, noticing the little hairs on the edges of the leaves, FSL had a taste and then most children wanted to try, discussed the importance of picking them at a level where dogs couldn't urinate on them

-Tea making – FSL suggested 'I think we might need to make the tea, would anybody like to help' – two children volunteered and came over – they asked the FSL about what they should do. Her responses emphasised a child-led approach 'You are in charge. How do you think we should do it?', offered suggestions 'Maybe check with _____', clarified that they were safe with the boiling water 'You know how to do that safely?', and asked questions 'How will you mark it (hot tea) so we don't fall over it?'.

-With the caw-caw call the FSL reminded the children to all reply so that people further away can hear and a child suggested 'like an echo'

-Eagle eye- two children came to the FSL and explained 'We hid in the same spot twice and nobody found us' to which the FSL replied 'It was obviously a good hide'

-Revisited the 3 golden rules – keep ourselves safe and happy, keep others safe and happy, keep nature safe and happy' – FSL suggested that if we ask ourselves 'did we do these three things' we can usually find the answers to problems

-During eagle eye one child seemed unsure if they would play or not and asked can I watch to which the FSL said 'Yes it can be a good idea to watch to learn' and then wanted to be an eagle to which she said 'There can be two' and then didn't want to be which was also ok

-One child had a yellow jacket which they announced they needed to take off or they would be easily seen and caught – likened this to camouflage

-For free play the FSL showed the children a box of materials and tools – string, scissors, clay, magnifying glasses, bug boxes, drawing paper and pencils – that they could use as they needed

-She gave some direction through suggestions – you can draw things you see, use the bug boxes for collecting and examining them up close, continue with the bird name necklaces -One child told the FSL she was absent when they were doing the bird name necklaces and the FSL remembered she had made her one, the child asked how she knew and she said 'I missed you' – child paused and looked and her, smiled and said 'oh' - relatedness -Free play activities included a hospital with medicinal plants, a shop, climbing on rocks -A dog came by the base camp – FSL said 'We don't worry, we put our arms like this (crossed) and ignore' -Sit spot – find a place within the boundaries away from everybody else to take a few quite moments to notice with the senses…what you see/what you hear/what you feel -Closing circle – share something I noticed and something I am grateful for – e.g. 'I am grateful for friends…I hurt my finger and they set up a nature hospital and helped me'	
Regular Sessions Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation, and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing *Blocks and Sessions have beginnings and ends	Yes – Session 3/9 Beginning – Gathered in a circle at the meeting point, walked to base camp together, gathered in a circle again End – Sit-Spot Closing Circle
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	The Forest School site is an area in a local public park, about one kilometre from the school. Each group has its own base camp with identified boundaries. The terrain is wooded with a steep incline and some areas with large rocks.
Community Forest School uses a range of	-Choice of what to make the tea from -Box of prompts for play -Free play -Trust when making the tea

learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	
Holistic Development Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent, and creative learners.	-Responsible for their own coats (taking them on and off) -Self-soothing through the 'nature hospital'
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Picking nettles -Incline with a large rock within the boundaries
Qualified Practitioners Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	Yes Level 3 trained leader + additional adult with a group of 10 children
Additional Notes	
• The FS leaders met to reflect on their sessions afterwards • They planned for next week's session • Each session is designed to include: o Inspiration; Knowing and noticing plants and animals o Excitement; Play games and challenge ourselves and each other o Focus; Create using natural materials o Relaxation; Hang out o Celebration; Celebrate being together and the seasons o Reflection; Use sit spots to take time to reflect o Integration; Linking to home, parental involvement	

Case 1 Observation Session 2

Session Overview

- Gathered at carpark
- Free play
- FSL had a bundle of willow branches that some of the children came to look at
- Formed a circle – focused on the bendy branches and discussed collecting similar materials
- Walked/collected/foraged for wild tea
- Circle at base camp
- Some weaving but the children wanted to return to their play, many incorporated the weaving circles in different ways
- Lunch and Story, Wild Tea
- Group game
- More free play
- Sit spots
- Closing circle

Notes

- The children had looked at some material on birds and sight before this week's session – birds eye view/ peripheral and foveal vision/catching prey
- The FSL had some willow rods when we met at the base camp – some of the children came over to investigate and the FSL encouraged them to examine them – how they feel (bendy) and how she had used willow to weave her basket - she suggested weaving them into circles and showed the children one
- When she used the call to gather the group she showed the children who hadn't seen it and suggested they might want to keep their eyes open for other plants that are bendy on the walk to base camp – some children suggested sticky weed and started to collect it, others ivy
- A few began to form their sticky weed into circle and wore them as crowns on their way to the base camp
- Elderflowers had begun to flower which the FSL pointed out – the children suggested that they would make elderflower tea so collected some in the flask
- Later they decided they wouldn't strain the flowers because they looked beautiful
- Once they got to basecamp the FSL demonstrated weaving a circle again and linked looking through it to a bird's eye view
- However, the children were keen to continue with their play and so they used circles for lots of different purposes - some made flower crows, some as necklaces, one in a hut to hang things from, some for decorating, some for

selling in the shop. The FSL emphasised the importance of repetition and extension in play. • Some used them to look through as had been suggested and focused in on insects and plants – the FSL brought the Collins Complete Guide to Irish Wildlife that the children could use to identify what they had found – used magnifying glasses to examine details as birds have better eyesight than us • In the shop the children took on different roles – collectors, stockists and organisers • The box of materials from other sessions was accessible to the children if they needed it • The story at lunch was about the King of the Birds which linked to the focus on birds • Game – Hawk and Wren – The children formed a boundary (circle) and one child was the hawk. They had very focused vision, looking through a toilet roll with the other eye covered. Another child was the wren, their prey, who had to try to stay out of sight within the boundaries and not get caught.	
Regular Sessions Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing *Blocks and Sessions have beginnings and ends	Yes – Session 5/9 Beginning – Gathered in a circle at the meeting point, walked to base camp together, gathered in a circle again End – Sit-Spot Closing Circle
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	Yes – woodland about 1 kilometre from the school
Community Forest School uses a range of learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	-Free play was explicitly labelled as 'free play' for the children -Free play preceded over the leader's plan for the willow circles as a 'birds-eye' lens -The leader made suggestions but did not give directions -The children had to agree on a plant to make tea from – compromise
Holistic Development Forest School aims to promote the holistic development of all those	-Creativity was fostered through the use of the willow circles in lots of different ways -Activities were open-ended

involved, fostering resilient, confident, independent and creative learners.	-Children were free to move within the boundaries
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Incline with a large rock within the boundaries -Willow are long bendy branches so the children had to be careful when carrying them
Qualified Practitioners Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	Yes Level 3 trained leader + additional adult with a group of 10 children

School 1 Observation Session 3

Overview of Session

- Dropped to carpark
- Free play
    - Balancing on a log
    - Rough and tumble play
    - Running fast
    - Pretend play e.g. cutting with a scythe
    - Picking flowers and leaves at the furthest end of the boundary
- Call to gather into groups
- Group game – Bat and Moth
- Walk up – FSL prompted them that next week is parent's week and they might like to think what they would like to show them, encouraging them to look around and think
- Foraged for wild tea
- Free Play/Tea making
- Lunch/Story/Tea
- Land Art
- Planning for Parents Session
- Sit Spot
- Closing circle – what I noticed and what I'm grateful for

Notes:

-Bat and Moth; Children formed a boundary by making a circle. Discussed how bats have poor eyesight and echolocation. The child who is the bat is blindfolded and calls out to which another child, the moth, replies. The children on the boundaries also call 'cave' if the bat comes close.

-Children were reminded that this sessions they were going to plan for the parents session - how will we guide them up to the base camp/what will we show them/what tea will we make/what game will we play/what story will we tell/finding a sit-spot to share with them – all up tot eh children to decide

-FSL gave suggestions to think about e.g. birds/bugs/plants/birdcalls

-Wild Tea – What do you want to make? Who will collect it? Children chose a combination of nettle and sticky weed/cleaver tea

-Noticing plants on the walk up – one child thought a tree was beech and wanted to pick some leaves to eat, another pointed out that it wasn't beech, he asked how she knew and she said it doesn't have any little hairs

-The walk up included navigating logs/branches/rocks – the children appeared more adventurous going over and under things, climbing more rather than sticking to the path

-Group game –Hungry Birds; The children divided into two teams. Each had a stick with some lengths of wool in different colours – red/yellow/blue/brown and green. This showed the colour worms they needed to collect as a team. They tied the worms

they found to another stick. The children were like young birds, sticking together, to help each other hunt for food. -FSL suggested having lunch but a few children asked for some free play – agreed to 5 minutes – some wandered back to the base, some were called with caw-caw -Children organise the washing hands – spray and a cloth for drying -Story - folktale 'How the Dragonfly Came to Be' -Story was a stimulus for a bug hunt and land art – making creatures out of natural materials -Children made butterflies, dragonflies, flies and spiders out of pine cones/oak leaves/ferns/twigs/beech leaves/flowers etc -FSL leader and SET wander, observe, describe what they see, comment on specific elements that they like -Children asked could they go further to collect things they needed for their creations – FSL emphasised the boundaries but was willing to stretch them to where she could see as the children have become more familiar with the space – "You can't wander too far because you are very important in this group' -FSL takes out a knitted squirrel, Rua, which she introduces to two children playing in the shop, children who would need some additional support around social skills – at first she echoed the children's narrative of what they were creating to sell – she then gave Rua to the children and they continued to use him to converse, as if through a puppet – they asked questions, described and engaged in a must deeper conversation than they had previously -Formed a circle again to plan for the parent's session -When the children were voting on ideas the FSL encouraged them not to influence others as everyone is entitled to their vote -Tea – decided on a cocktail to combine different ideas -One child asked if they could have a day of just free play because that would be the best day -Sit Spot – just notice things -Closing circle – What I noticed/What I'm grateful for e.g. 'I heard the rain and a bit of wind and I'm grateful for finding those bugs and making something', 'I'm grateful for my sit spot and saw bugs', 'I noticed a plant that looked like seaweed – well the texture', 'I'm grateful for the opportunity to come out to the forest because not all schools get to do it', 'I liked free play because we made a wishing well', 'I'm thankful for everyone in the group'	
Regular Sessions Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing	Yes – Session 7/9 Beginning – Gathered in a circle at the meeting point, walked to base camp together, gathered in a circle again End – Sit-Spot Closing Circle

*Blocks and Sessions have beginnings and ends	
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	Yes – woodland about 1 kilometre from the school
Community Forest School uses a range of learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	-Free play -Planning for a parent session -Children were to lead the session -Children decided what they would show the parents
Holistic Development Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	-Risky play links with resilience -Creativity was fostered by allowing the children to plan the parent session
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Walk to base camp – logs/branches/climbing -Rocks within the boundaries for climbing on
Qualified Practitioners Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	Yes Level 3 trained leader + additional adult with a group of 10 children

Case 2 Observation Session 1

Session Details

- 2 Forest School leaders
- 6th Class spilt into 2 groups of 15, 1 group attend a 2-hour morning slot and 1 group attend a 2-hour afternoon slot, SET stays with group in school, class teacher goes to the forest
- Met the children at the school (It was their first session)
- Walked the group to the site – 5 minutes
- Stopped midway to give the children a 'challenge' – explained how our eyesight is deteriorating due to increased screen use etc. – using our eyes to spot things around us – each pair was given a natural object e.g. ash buds, sycamore branch, alder cones – each pair made a bird call (caw caw) when they spotted their item and the group stopped to examine it, to look closely, to wonder if they matched or if there were subtle differences, to name the trees
- First site was a small green field with bushes as a boundary at one end and a pile of woodchip at the other
- Started in a circle – circles are important as everybody is equal and everybody can be seen, heard and listened to
- At Forest School we keep ourselves safe, others safe and nature safe – children's responsibility for themselves was emphasised 'If you are cold put on your coat, if you are warm take it off'
- Played 3 games on the field
    - Name Tag – getting to know names, recognising the boundaries
    - Square tug-o-war – rope knotted into a square, divided into teams, each team pulls their side of the square back as far as they can - children willing to get dragged onto the wet ground to hang on
    - Bat and Moth – most of the group form a circle as the cave, bat is blindfolded, calls a word to replicated echolocation and the moth calls a reply, bat attempts to catch moth within the circle – children could choose their echolocation words and choose if they wanted to play
- Moved into the adjacent Forest Site
- Safety – stages with red ties to mark areas where 'you really need to use your sense to make sure that you are safe'
- Formed a circle at base camp
- FSL asked the children to divide into three groups to make their own base camps, given tarpaulin and ropes but could also use natures materials
- Groups had formed within a minute and the children found space and started to work – each group took a different approach
- FSL introduced fire lighting – using flint to create spark to light cotton wool and then dry twigs
- Children were free to join and out – everybody does not have to do everything at the same time – some children tried and succeeded quickly, others didn't get involved, one girl spent 5 minutes trying and it wouldn't work – there

were offers of help but she kept trying, she eventually managed it and was visibly delighted • Closing circle – what people liked and would like more of – most responses were more of the same – fires and building – one boy suggested that he would like if other groups allowed him to see how they were building • Children were keen to get hand sanitiser to clean their hands when they had time to look at them!	
Regular Sessions Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing *Blocks and Sessions have beginnings and ends	- 1/3 (No, Pilot project between the school, the leaders and a local university offering the woodland site) -Beginning and End – circles -Not all children had appropriate clothing, the day was mild and dry
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	Yes – small plot of woodland about a 5-minute walk from the school
Community Forest School uses a range of learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	-Games to build trust e.g. bat and moth -Play at a 6th class level – building the base camp structures -Use of circles to ensure that everybody has a voice and is listened to
Holistic Development Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	-Responsibility to regulate themselves e.g. take on and off their own coats
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Risk assessment carried out -Blindfolded -Fire lighting
Qualified Practitioners	Yes

Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	
Additional Notes Sessions include elements that ‘Create, Inspire, Excite’	

Case 2 Observation Session 2	
Session Details • Same group and setting as Session 1 • Stopped on the way to the site – FSL gave a number of animal facts and children guessed the animal, an otter was focused on as there is a new local initiative drawing peoples attention to otters living in the river with a series of facts posted along the river walk • Formed a circle and introduced a new game – the leaders names animals (e.g. bear, sparrow-hawk, crocodile) and elicited how these animals might hunt and what their weaknesses might be i.e. how the prey could get away. An example was running in a zig zag from the crocodile as they cannot turn very fast. The game involved lots of movement. • One of the leaders demonstrated how a simple bow and arrow could be made from light branches and string. The children were asked to form three groups, search for light branches for arrows and could have a go using the bows that were made. Some children suggested that they could make one that would fire the arrow further and were encouraged to go ahead and make it. The FS leaders advised that the children stay out of the way of the 'arrows' but there were no definitive rules e.g. line up in a straight line. One group, with some members who appeared to have some prior skills such as knot tying, managed to make a very impressive bow and arrow and were notably excited. They were keen to show others and while there had been no emphasis on a competitive element to the shooting themselves initiated marking where their arrows went to. • The group, led by the leaders, entered the forest setting. • Everyone gathered around the fire pit in a circle. The leaders gave a number of suggestions of activities the children might like to engage in. • These included: returning to building their shelters from last week, building waterproof shelters which one of the leaders demonstrated as a 'bear grylls' style survival technique, creative activities (Christmas decorations using twigs and string), using tarpaulins/ropes/hammocks • There was no fire this week which some of the children appeared disappointed about • All the children were observed to work in either pairs or groups • At the end everyone went around to look at what each group had done – two groups made waterproof shelters and a volunteer put their head inside while water was poured over – one was completely successful, one didn't have enough material but the emphasis was on 'is the top waterproof', another group returned to a shelter they had been building the previous week and had insulated it and another group hung a hammock (rope work) and tried it out • Closing circle – what they would like to do for their final session next week – emphasis on everybody being heard/all suggestions are valid – lots of suggestions included fire e.g. cooking on a bigger fire	
Regular Sessions	- Session 2/3

Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing *Blocks and Sessions have beginnings and ends	-Opening and closing circles -More children had waterproofs
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	Yes – small plot of woodland about a 5-minute walk from the school
Community Forest School uses a range of learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	-Children were observed to work in groups or pairs -Choice between activities -Children were asked for their input into the plan for the final session
Holistic Development Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	-Creative tasks e.g. making decorations using natural materials -Bow and arrow activity was open ended and encouraged the children to problem solve
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Risk assessment carried out -Blindfolded -Fire lighting
Qualified Practitioners Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	Yes

School 2 Observation Session 3

Overview of Session

- Gathered at school
- Walk to the site
- Games – children chose from the games they had played
- Entered the wooded area to the base camp
- Opening circle around a fire – one minute to just be present
- Children were given clay to create with while one of the FSL's told a story of a hunter getting lost in the snow, with a focus on survival skills, the seasons and the power of stories to gather a community
- Round to describe what each person had created
- Choices about the day's activities – these included returning to shelter building, cooking on the fire, rope work to make a blindfolded senses trail, slack lines for balancing on, creative activities with clay
- The children divided up and moved between the activities
- Closing circle – how they felt about their 3 sessions of Forest School

Notes:

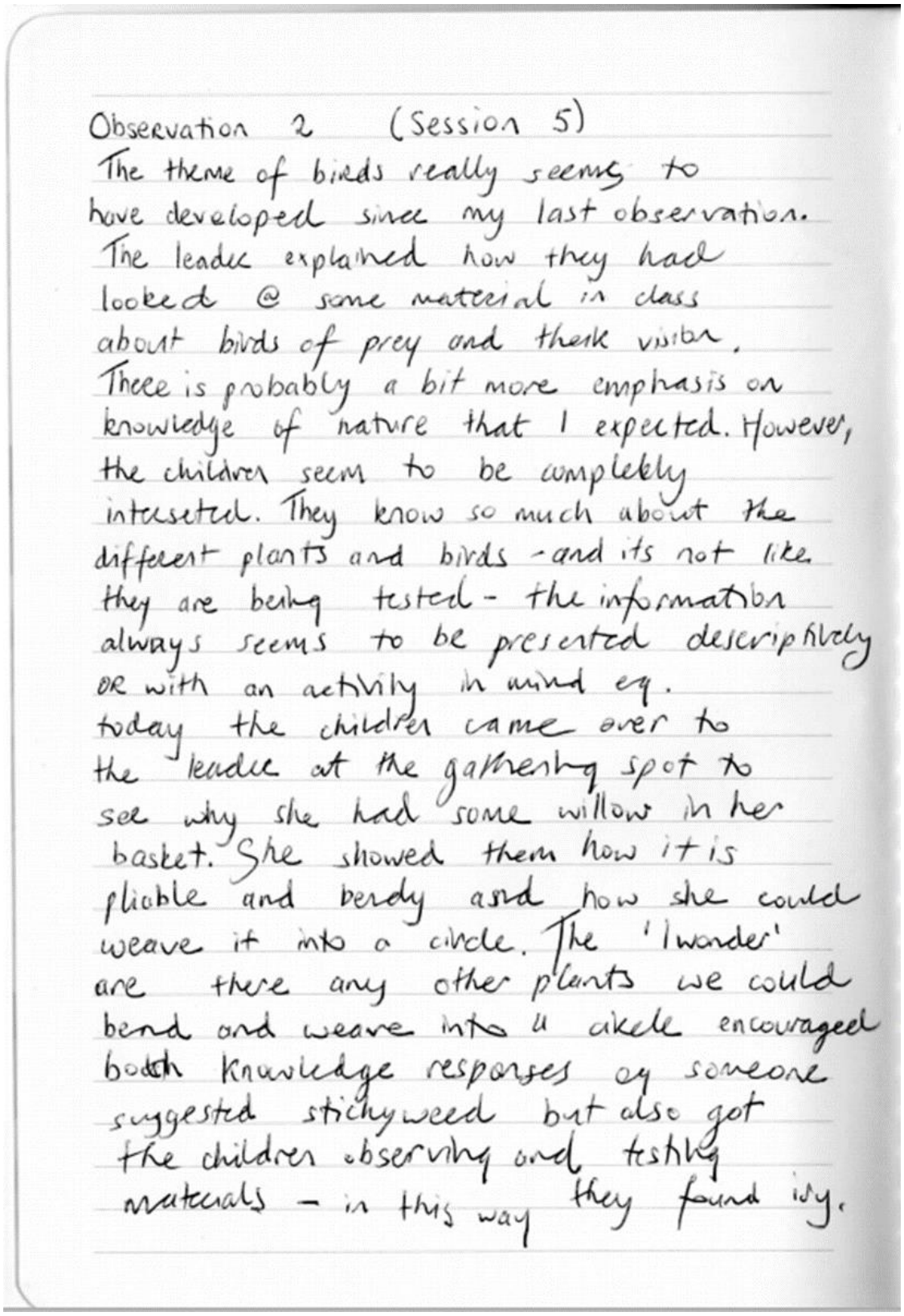
-Walk to the site – noticing the local area
-Games - choice between games they had played, all of the games involved teamwork
-Each child was given clay – they could use it to create something as they listened to the story but they could also use it to just have in their hands and to manipulate, to feel the texture and to focus – some of the children were observed to focus and create something e.g. one created a character from the story, others made something and then rolled it back into a ball and repeated this process and some just plied with it
-When one of the FSL's went around the circle to ask about what they had made everybody got a turn to speak, even those who did not appear to have used it to 'create' anything – equal opportunity to speak and to be listened to
-Story was a stimulus for survival skills – e.g. lighting fires, building shelters
-Choice between activities
-Fire and rope work (slacklines for balancing on) both involved risk and both appeared to be what the group were drawn towards
-Some used knives to whittle sticks to toast marshmallows on over the fire
-Others wrapped bananas and chocolate in foil to bake
-One girl made popcorn using two sieves held together with wire over the flames – it took some time for the kernels to pop but she was determined to stick with it until they did and was evidently proud of her achievement – she explained to the Forest School leader that she had refused to go camping with her dad before but now she would definitely go
-The children found all sorts of ways to experiment on the slack line – when some got confident walking along as on a tightrope with a guiding rope overhead a few

children got on together and formed teams rocking each other over and back by leaning back on the rope -At the end one of the leaders suggested setting up the blindfolded sense trail for the next group and even though they would not get to have a turn two of the children joined in in helping unravel the rope and choose a trail -Closing circle – what the children had to say about their Forest School experience	
Regular Sessions Forest School is a long-term process of regular sessions, rather than a one-off or infrequent visit; the cycle of planning, observation, adaptation and review links each session. *Forest School happens over time *No such thing as bad weather only bad clothing *Blocks and Sessions have beginnings and ends	Session 3/3 Beginning – Opening circle around the fire End – Closing Circle
Woodland Setting Forest School takes place in a woodland or natural environment to support the development of a relationship between the learner and the natural world. *Setting is not the usual one	Yes – small plot of woodland about a 5-minute walk from the school
Community Forest School uses a range of learner-centred processes to create a community for being, development, and learning. *Trust is central *Learning is play-based and as far as possible child-initiated and child-led	-Choice between the games they had played in Session 1 and Session 2 -Story about community -Circles
Holistic Development Forest School aims to promote the holistic development of all those involved, fostering resilient, confident, independent and creative learners.	-Creativity encouraged by using clay as a medium to express responses to the story -Children took responsibility for the cooking and organising the activities
Opportunities to take Risks Forest School offers learners the opportunity to take supported risks appropriate to the environment and to themselves. *The Forest School is made as safe as reasonably possible to facilitate children's risk-taking	-Fire -Ropes -Slack lines (tightrope) -Knives
Qualified Practitioners	Yes

Forest School is run by qualified Forest School practitioners who continuously maintain and develop their professional practice. *The staff are trained	2 x Level 3 trained leaders + Class Teacher with a group of 15 children

Appendix U Reflective Diary Excerpt

The excerpt relates to Case 1 Observation 2 (Session 5 of 9)



Observation 2 (Session 5)
The theme of birds really seems to have developed since my last observation. The leader explained how they had looked @ some material in class about birds of prey and their visitor. There is probably a bit more emphasis on knowledge of nature that I expected. However, the children seem to be completely interested. They know so much about the different plants and birds - and its not like they are being tested - the information always seems to be presented descriptively or with an activity in mind eg. today the children came over to the leader at the gathering spot to see why she had some willow in her basket. She showed them how it is pliable and bendy and how she could weave it into a circle. The 'I wonder' are there any other plants we could bend and weave into a circle encouraged both knowledge responses eg someone suggested stickyweed but also got the children observing and testing materials - in this way they found ivy.

Even with the plan of weaving circles - which had been anticipated as a sort of lens to look through and examine the environment as with a 'birds eye view' the children were so eager to get back to their play when we settled into base camp.

The leader seemed to follow the childrens lead. She laid out materials that they had used during other sessions and while she demonstrated weaving the circle the children used their circles for lots of different purposes and in lots of different ways in play. There was no right and wrong way - crowns, necklaces, a hook, Some of the children did use the suggested activity and looked through their circle to examine bugs and plants. The leader offered suggestions such as a book about wildlife if they wanted to know more about what they had found.

The childrens curiosity was so evident. Some wandered off by themselves examining the environment within the boundaries. Others formed groups and immersed themselves in their play. One particular group returned to their 'shop'

Appendix V Pattern Matching Codes

Proposition	Pattern Matching Codes
Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School.	'choices between activities' 'self-direction' 'engagement and/or enjoyment'
Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School.	'risk' 'increased mastery' 'engagement and/ or enjoyment'
Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School.	'relationships through play' 'relationships through teamwork' 'engagement and/or enjoyment'
There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School	'outdoor environment' 'connection with nature' (enjoyment of nature / empathy for creatures / sense of oneness / sense of responsibility)

Appendix W Phases of Thematic Analysis

The thematic analysis process followed the six-phase approach outlined by Braun and Clarke (2006).

Phase 1

The researcher had conducted all of the interviews and therefore had exposure to the data before the transcription process began. Each interview was listened to and transcribed verbatim by the researcher, which provided the opportunity for immersion in the data. Each transcript was read multiple times for accuracy and to explore the data. After each interview was conducted the researcher had made some notes in a research diary. These were revisited and read in relation to the relevant interview transcript. In the case of the child conversations, children's drawings were copied and appended to the relevant transcript. The researcher made initial notes during this phase, used to inform initial coding in subsequent phases.

Phase 2

This aim of this phase was to identify and code elements of the data that were interesting or meaningful. As the thematic analysis process in this study was theory-driven the data was approached with the theoretical propositions in mind. Following the initial stage of deductive coding, the transcripts were re-read with the aim of coding data that did not fit with the theoretical approach or added a new perspective to the theoretical approach. The code 'novelty' emerged through this indictive coding process. Although it had not initially considered in codes related to SDT, research suggests that novelty may in fact have a role to play in our understanding of the SDT. Data relevant to each code were collated using the data management software, NVIVO 12. An example of initial coding is presented below.

Data	Initial Codes
Researcher: And so then I suppose just looking at the sessions we've had, in your opinion, would you see different opportunities for learning in the Forest School sessions to the classroom? Class Teacher, School 2: Ah. Oh gosh, yeah. Am, yeah, it's all so different. Am, and it's great and I'm all for it, because	

am, I'm very conscious of the limitations of the school environment. Am, you know, but I'm all too aware of the criticisms of the school system and all that, so I would, and an awful lot of them are very valid, but we just have to deal with the reality as it is. So when I heard about this, I was all for it and I'm totally behind it. Am, I've, you know, I would try and build up the positivity, among the children, you know, telling them in advance, you're going to love this, this is fantastic and giving them all the positive feedback from the last group as well to the current group. Am, giving them that feedback that the last group, you know, they were very engaged and that class were, there were a lot of children with complicated needs and they surprised me in only positive ways and how well it suited them. Because you know, it might not be for everyone. Some of them, I might have imagined that they would choose video games over being out in the woods any day of the week but that was not an issue at all. Yeah, I noticed similar this time around now, that there were no complaints about getting bored and things like that.	*FS as a different space* *Teacher support* *Teachers attitude* *Positive experience* *Engagement* *Experience of children with additional needs* *Different perspective* *Negative experience* *Different perspective* *Engagement*
Researcher: Okay	
CT S2: And, and it's great to see what activities they engage with, especially when they had choice over it, and they had a lot of choice. And it was very interesting to see what they were drawn towards because you know, given how different it is in the classroom, there was very little I could have predicted.	*Engagement* *Choice* *Motivation/ Interest* *Different perspective*
Researcher: Okay. Yeah. And I suppose that is interesting to me when you bring up about choice. In that setting, did you feel the children got opportunities to direct their own learning and get to make those choices?	
CT S2: Ah, yes. I believe so. I mean, it wasn't just 'a' or 'b'. A lot of the time they had three or four options.	*Choices*

Sometimes, you know, you could, there's a, there's a fear of option paralysis that 'a' it sounds great to have plenty choice, but option paralysis is something that I think is, ah, something that's overlooked. And I thought it was good to have a limited number of choices, but there are plenty of choices. They had three or four and that was enough. I wouldn't have wanted them to have more than that because some of them wouldn't have known whether they were coming or going then. Am but actually in the afternoon, just today there was a bit of improvisation went on as well. Am, for example, when a child, no two children got the idea to make a, make a swing and then another child saw it and he did his own swing and it came up that there was a child who knew how to make a ladder, so she got to make a ladder with another girl. So these were things that hadn't happened in the morning, but just based on these children's interests and existing skills from scouts and things like that, it was worked into the afternoon. Researcher: And were Eve and Jack open to that and taking that course that if they had suggestions? CT S2: Yeah, they were always open to going with it. I think that it must be part of the approach of the Forest School that they would observe a lot of the time and just see what direction does this group want to go in. And I got that impression when they were inside the enclosed area they were using the open air for the games. But when they were in the more enclosed area, um, they would be told what options they had. And I think Jack and Eve were doing a lot of observing and just seeing what was grabbing their attention and kind of, not directing them, but just picking up on these opportunities to improvise a little. So I thought that was good. Yeah.	*Social Boundaries* *Structure* *Child-led* *Creativity* *Physical activity* *Child-led, intrinsically motivated* *Increased mastery, developing existing skills* *Child-led* *Observation* *Physical Boundaries* *Structure/Choice* *Observation* *Motivation* *Scaffolding*

Phase 3

This phase involved sorting the codes into potential themes and collating the relevant coded data extracts within the identified theme. Using NVivo, the codes were grouped into categories. The initial categories were guided by the study propositions and included 'autonomy', 'competence', relatedness' and 'nature connectedness'. Codes that did not fit into any category were initially placed into a category labelled 'miscellaneous'. Some of the codes within each category were merged or clustered to reflect a meaningful pattern in the data. For example, 'Physical Boundaries' and 'Social Boundaries' were coded together as 'Boundaries'. Other initial codes were spilt. 'Forest School as a different space' was divided into a 'Different Learning Space', 'Different Behavioural Space' and 'Different Physical Space' to reflect the patterns in the data. This phase ended with a table of potential themes and relevant codes.

Initial Codes	Categories
Birds and Animals Connection with Nature Appreciation of Nature Local Area Using Natural Materials Nature Based Activities Plants Space Getting Dirty Trees Outdoors Space Noticing Nature Dogs/Fear of Dogs Bringing Family Back	NATURE CONNECTEDNESS
Care Relationships Connections with Adults Help Change of Perspective Ripple Effect Playing with Others Social and Emotional Learning Working Together Trust Promoting Social Skills	RELATEDNESS

Child-Led Choice Creativity Different Space Direction Free Play Play Freedom Independence Movement Observation Time alone FS as a different space	AUTONOMY
Assessing Risk Challenges Fire Mastery Independence Learning Ropes Scaffolding Skills Risks Structure Being Prepared Resilience Safety	COMPETENCE
Being Present Bring the Experience Home Physical Boundaries Social Boundaries Challenges Curricular Links Enjoyment Teacher Attitude Concentration Fun Engagement Noticing Novelty Parental Involvement Participation Positive Experience Power Need for Suitable Clothing Teacher Support Experience of Children with Additional Needs Negative Experience	MISCELLANEOUS

Revised Codes	Categories (Themes)
Natural Resources Nature Based Activities Awareness of Nature Contact with Nature Enjoyment of Nature Learning About Nature Sense of Place	BEING OUTDOORS
New Perspectives (Adult Child) New Perspectives (Child Child) Care Facilitating Interactions Trust Playing Together Relationships with Adults Social and Emotional Skills Teamwork Time Alone	BUILDING RELATIONSHIPS
Child-Led Child's Voice Free Play Creativity Making Choices Open Ended Activities Different Learning Space Different Behavioural Space Different Physical Space Freedom Movement	FREEDOM AND CHOICE
Confidence Different Focus Increased Mastery Independence Overcoming Challenge Skill Development Fire and Rope Use Risk Assessment and Management Risk Taking Scaffolding	GROWTH AND DEVELOPMENT
Boundaries Direction Plan	STRUCTURE

Fun Novelty Positive Experience Dogs Getting Dirty Negotiating Groupwork Weather and Clothing Being Present Focus and Concentration Participation Bring the Experience Home Curricular Links Parental Involvement	VIEWS AND EXPERIENCES OF FOREST SCHOOL

Phase 4

This stage involved reviewing each of the potential themes with the aim of refining them. The aim was to ensure that data within each theme were cohesive while data between themes were distinctive. Themes were reviewed at two levels.

Level one involved reading the collated data extracts for each theme, using NVivo, and considering whether they followed a similar pattern. In cases where the data extracts were not cohesive, some themes were changed, or data were coded elsewhere. Level two involved the creation of a thematic map to establish if the themes accurately reflected the meanings evident in the data set as a whole. The interview recordings were listened to again and transcripts were re-read in relation to the thematic map. The existing codes and themes were reviewed, and any additional data coded that had been missed in earlier coding stages. This process of re-coding reflects the organic nature of the thematic analysis process.

Furthermore, an independent coder was employed as a means of ensuring internal reliability within the analysis process. The second coder was a fellow TEP who was familiar with the Braun and Clarke approach to TA. The researcher briefed the second coder on the established method of coding data. As the deductive analysis was related to the research questions, the coder was given the research questions to accompany the transcript. Inconsistencies between the researcher and second coder were identified and consensus was achieved via discussion, in line with previous research (K. Bradley & Male, 2017).

Phase 5

The aim of this phase was to define and refine the themes. The extracts within each theme were re-read to ensure the themes were "internally coherent, consistent and distinctive" (Braun & Clarke, 2006, p. 96). It was also necessary to consider how the themes related to each other in order to ensure they told the story of the data in relation to the research questions. At this stage it was considered if themes contained sub-themes. For example, the code 'child-led' was merged with the codes 'child's voice' and 'free play' to form the subtheme 'Child-centred approach' under the theme 'Freedom and Choice'. Themes and sub-themes were renamed and reorganised until they accurately reflected the data.

Theme	**Subtheme**	**Codes**
Being Outdoors	Affordance of Nature	Natural Resources Nature Based Activities
	Connecting with Nature	Awareness of Nature Contact with Nature Enjoyment of Nature
	Knowledge of Nature	Learning About Nature Sense of Place
Building Relationships	Different Perspectives	New Perspectives (Adult Child) New Perspectives (Child Child)
	Facilitating Social Connections	Care Facilitating Interactions Trust
	Relationships with Others	Playing Together Relationships with Adults Social and Emotional Skills Teamwork Time alone
Freedom and Choice	Child-Centred Approach	Child-Led Child's Voice Free Play

	Choice	Creativity Making Choices Open Ended Activities
	Different Space	Different Behavioural Space Different Learning Space Different Physical Space
Growth and Development	Competence and Confidence	Confidence Different Focus Increased Mastery Independence Overcoming Challenge Skill Development
	Managed Risk Taking	Fire and Rope Use Risk Assessment and Management Risk Taking
	Scaffolding	Scaffolding
Structure		Boundaries Direction Plan
Views and Experiences of Forest School	Attitude Towards Forest School	Fun Novelty Positive Experience
	Barriers to Participation	Dogs Getting Dirty Negotiating Groupwork Weather and Clothing
	Engagement in Forest School	Being Present Focus and Concentration Participation
	Links Beyond Forest School	Bring the Experience Home Curricular Links Parental Involvement

Phase 6

The final themes and subthemes were documented in the case report.

Appendix X Case 1 Analysis of Proposition 1

Proposition 1 hypothesises that children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 1 for Case 1.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 1. Part 2 documents correlations between the 'Autonomy' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between autonomy and engagement. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 1, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 1.

Part 1: Criteria for Interpreting Proposition 1

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School.	The perceived autonomy subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation	Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about the activities they engage in at Forest School and choices about how they execute activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School	Pattern-matching: Interview responses that link opportunities to make choices about the activities a child engages in and choices about how they execute those activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School

Part 2: Scale Data

The relationship between perceived autonomy (as measured by the Perceived Autonomy subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was no significant correlation between the two variables.

The mean scores and standard deviations for the 7 individual items from the 'perceived autonomy subscale' are outlined in Table X1 below to provide greater insight into children's responses.

Table X1

Case 1 Perceived Autonomy Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
I feel like I am free to decide for myself how I do things at Forest School	5.6	.96
I feel pressured during Forest School (R*)	6.3	1.06
I can tell people my ideas and opinions at Forest School	5.9	1.29
At Forest School I often have to do what I am told (R)	3	1.83
People at Forest School tend to take my feelings into consideration	6.1	1.15
I feel I can pretty much be myself when I am at Forest School	5.8	1.76
There are many chances for me to decide for myself how to do things at Forest School	6.3	1.20

* (R) Reversed

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived autonomy. Table X1 above shows that mean scores for six items were above '4'. However, a mean score of '3' on the item 'At Forest School I often have to do what I am told', after reverse coding, suggests that children in Case 1 perceived that they had to do what they were told at Forest School.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table X2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table X2

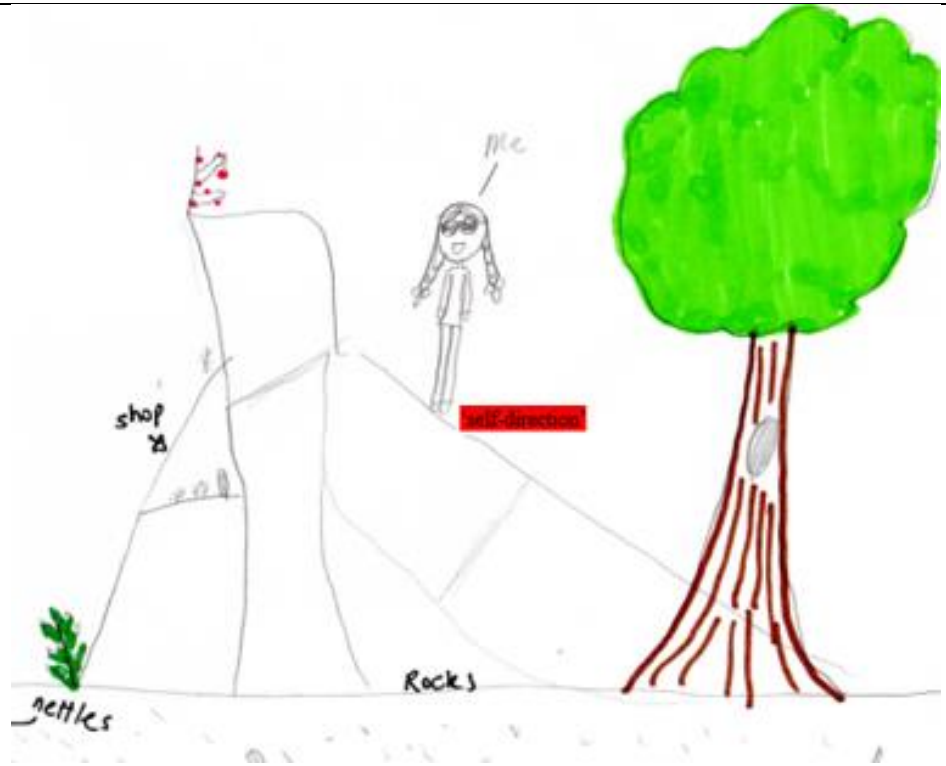
Intrinsic Motivation Subscale

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.25	.68
I enjoy going to Forest School	6.56	.63

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria
Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about what tasks or activities they engage in at Forest School (choices between activities) and choices about how they execute those tasks or activities (self-direction) with a sense of engagement and enjoyment or the opposite Pattern-matching codes applied: 'choices between activities' 'self-direction' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern

Kate	
Kate describing how the rocks in her picture were where the boys set up a shop during free play; *Are the girls involved in the shop or are the girls doing other things?* The girls are all usually doing their things *What sort of things might they be?* Like C4, C5 and Sadie they're making like a small hospital … C6 is usually just writing in her diary and drawing in it and stuff *So is there a choice then at Forest School either to do things on your own or to do things with other people?* Yeah…and I usually do things on my own *And do you like that?* Yeah …	

Sadie	
Sadie describing what is different about Forest School compared with the classroom; And we don't do that many group things we can go and do our own things as well *…So, when you say we can go and do our own things do you have a choice about what you'd like to do there?* Yeah. If we want, we can build a little thing out of sticks. We could make like the boys were doing a shop. Sadie describing how the journey to the base camp can differ between sessions; And am sometimes we don't go straight to our base camp and we just like a few days ago we went to pick nettles… *On the way?* … Yeah cause we thought that we'd make nettle tea	N/A

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about what tasks or activities a child engages in at Forest School (choices between activities) and choices about how they execute those tasks or activities (self-direction) with a sense of engagement and enjoyment or the opposite Pattern-matching codes applied: 'choices between activities' 'self-direction' 'autonomy and/or engagement' Underlined text shows data that contradicts the predicted pattern
Lucy (Class Teacher)
What do you see as the opportunities for learning at Forest School? I see them taking on eh I see them taking on the course of the learning from me as facilitator but not necessarily teaching so they take the day takes what they want it to be (Lines 23 – 25) *In your experience do the children get opportunities to direct their own learning?* Yeah no I think they do because if like for example when we do the making the models land art last week you know one of the kids started off doing was it a snail and was like no I'll do a caterpillar so he ended up doing a caterpillar or actually it might have turned into a worm at the end of it ….so he literally like spent the whole time on his own he chose to be on his own and he was totally in the zone like we had to kind of stop him at some point (Lines 49-56)
Tom (Special Education Teacher)
In your experience do the children get opportunities to direct their own learning? Absolutely - one of the things they really like about it is that there is always a plan but when the children you know come up with an idea or they take things in a particular direction they are kind of free to do that …. they will sometimes make a suggestion, or they will start talking about something that we had never even considered, and it just brings the sessions off in another direction (Lines 64 – 73)
Anna (Parent)
What is your understanding, as a parent, of what the children do at Forest School? …So it's like their awareness of what's around them whether it's listening to the different types of bird call songs, whether its which type of am tea can we make, whether its that's a safe area that's not a safe area, or we are going to make something with materials that we've got at our disposal. And then I mean on another level in terms of particularly for my children and their ages the learning through play for me there's a huge emphasis on (Lines 81 – 89)

Rosie (Parent)
As a parent, are there any benefits you would see from Forest School? when you are doing something that's so child-led out in the environment you know your lesson could really take any direction…depending on the children's interests (Lines 179 – 182)…. And you know really there's often a sense that a lesson shouldn't really be taking on a life of their own and ending up in completely different places when you're inside the four walls, but it's much more accessible when you're outside you know and you're in that kind of an environment that's child-led by comparison to what often happens in the classroom….It can go into any topic, you know. (Lines 208 – 215)

Part 4: Thematic Analysis

Theme	**Subtheme(s)**	**Key Quotes**
Freedom and Choice	Child-centred approach Choice Different space	*Kate (Child 1) described an example of engagement in free play from her picture of Forest School:* It's like the rocks that's where the boys made their small shop *Sadie (Child 2) also spoke about free play:* …and we have lots and lots of free play. [Researcher: And when you say free play – what's free play?] It's when we can go around the base camp and play with each other. *Tom (SET) described the role of free play in allowing the children to direct their learning:* …things like free play, for example, am are fabulous because it does give the children that added sense of pupil voice, as well that they are using their own creativity, that they are coming up with their own ideas and the beauty of Forest School is that because you have smaller groups you get to hear the children a lot more *Tom also noted how creative activities facilitated choice within the activity:* …affirming them for you know the choices that they are making in terms of their creativity as well

		When asked to describe her experience of Forest School from a parent's perspective Anna commented: I think with all the daily affirmations and the clichés about looking at the world through the eyes of a child…it really does do that. *From her experience as a parent volunteer, Rosie observed that there is the freedom to deviate from the plan:* I wasn't actually with my own child but by doing it we were all following the same lesson plans let's say. So, I guess from week to week I would have known where my child would have been at in their group, now you wouldn't always cover the same things.
Being Outdoors	Affordance of Nature	*When elaborating on the shop that had emerged through free play, Kate described examples of how nature can be an open-ended resource:* Like they sell all types of like leaves and like and they also sell I think they sell also some like there are these tree thingys that smell really nice the ones that are kind of prickly *Lucy noted how the environment creates choice:* They see the potential of just it's not just going in the woods and just going for a walk there is so much more that they can do in the context of being in the woods.
Views and Experiences of Forest School	Engagement in Forest School	*…can you do more things on your own at FS compared to being in school or is it mostly the same?* *Kate:* I think for me FS is a bit more interesting *Researcher:* And what makes it more interesting? *Kate:* Because I get to be like I get to like spread out and like do what I want with nature and I also like being in the fresh air and I really like being in the forest

Part 5: Summary of Proposition 1 Findings in Case 1

The data related to Proposition 1 in Case 1 were analysed in accordance with the criteria outlined in Part 1 of this appendix. Analysis of the perceived autonomy subscale of the Basic Need Satisfaction in Forest School scale indicated that participants perceived autonomy was not significantly correlated with intrinsic motivation. When descriptive statistics for the seven individual items were examined six of the seven responses indicated relatively high perceived autonomy. One item, 'At Forest School I have to do what I'm told' indicated lower perceived autonomy. As the only item that scored below '5', it is worth considering why the children felt they had to do what they were told. As pattern-matching logic and thematic analysis applied to participants interview responses suggested a sense of perceived autonomy, it may be that developmentally the children perceived the adults to be in charge as they are still at school and thus they were still told what to do.

Pattern matching analysis across the child conversations and the interviews with teachers and parents linked opportunities to make choices between activities and self-direction within activities with a sense of engagement and enjoyment. More participants referenced self-direction within activities as opposed to choices between activities in their interviews. Participants interviews linked choices between activities with the flexibility of the Forest School leaders plans, with the children "taking on the course of the learning". Lucy, the class teacher, took on the role of the leader in one group due to issues with numbers. She described this role as "facilitator" compared to her normal "teaching" role. Tom, the teacher who observed sessions, commented on how the children were "free" to "come up with an idea" or to "make a suggestion". This is largely consistent with data related to Principle 3 - learner-centred practices (see Section 3.3, Figure 3.3).

Themes and sub-themes related to this proposition indicate that the participants' sense of autonomy was related both to social elements of Forest School (e.g. child-centred approach and choice) and elements of the natural environment (e.g. affordances of nature). Free play was associated with choices between activities by children, teachers, and parents. Both Kate and Sadie associated the choice that free play afforded them, either to choose between play activities or to choose to play alone or with others, with a sense of autonomy and engagement. Kate commented that for her Forest School "is a bit more interesting …because I get to be like I get to, like, spread out and like do

what I want with nature" (Part 4) while Sadie differentiated between group and child-led activities "And we don't do that many group things we can go and do our own things as well" (Part 3.1). Tom, having observed the sessions lead by Emmy (FSL), commented that free play gives an "added sense of pupil voice" (Part 4).

Children, parents, and teachers also recognised that the natural environment in an open-ended resource for the children. Sadie described how they could "build a little thing out of sticks" (Section 3.1). Lucy explained how land art, a creative activity using natural materials to make bugs, was a constantly evolving process "one of the kids started off doing was it a snail and was like no I'll do a caterpillar so he ended up doing a caterpillar or actually it might have turned into a worm at the end of it" (Section 3.2). Anna, a parent, also recognised the affordance of nature as a contributing factor in the children's opportunities to experience choice, "to make something with materials that we've got at our disposal" (Section 3.2).

Appendix Y Case 1 Analysis of Proposition 2

Proposition 2 hypothesises that children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 2 for Case 1.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 2. Part 2 documents correlations between the 'Competence' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between perceived competence and engagement. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 2, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 2.

Part 1: Criteria for Interpreting Proposition 2

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School	The perceived competence subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement or enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School

Part 2: Scale Data

The relationship between perceived competence (as measured by the Perceived Competence subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was a strong, positive correlation between the two variables, rho =.67, n =16, p < .01, with high levels of competence associated with higher intrinsic motivation.

The 6 individual items from the perceived competence subscale, with mean scores and standard deviations, are outlined in Table Y1 below to provide greater insight into children's responses.

Table Y1

Case 1 Perceived Competence Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
I often feel good at doing things at forest School	5.88	1.4
People at Forest School tell me I am good at what I do	5.13	1.78
I have been able to learn new interesting skills at Forest School	5.81	1.28
I feel a sense of achievement form what I do at Forest School	6.34	.8
At Forest School I get a chance to show how well able I am	5.69	1.54
I often feel well able to do things at Forest School	6.44	.96

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived competence. Table Y1 above shows that mean scores for all six items were above '4'.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table Y2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table Y2

Case 1 Intrinsic Motivation Subscale

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.25	.68
I enjoy going to Forest School	6.56	.63

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria	
Interview responses or elements of drawings that link a sense of competence through taking risks or increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Pattern-matching codes applied: 'risk' 'increased mastery' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern	
Kate	
When asked what she might do at Forest School Kate replied: Kate: Play games, find like stuff to make items out of like maybe a small table…but I do know how to make a conker Researcher: With a string? Kate: Am not like that but like once I saw this like conker person…it's really fun …like we use toothpicks and conkers we made the hole then put the toothpicks in then we got another conker put it on the other end and then on the bottom conker we put toothpicks for like arms and legs	N/A

Sadie	
When asked about what she might do at Forest School Sadie replied: Sadie: And sometimes we play eagle eye Researcher: Eagle eye - is that the game where there's someone on the rock and they are looking for other people? Sadie: Yeah Researcher: Do you like eagle eye? Sadie: Yeah mainly because me and my two friends we find the perfect spot up on the rocks	N/A

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link a sense competence through increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Pattern-matching codes applied: 'risk' 'increased mastery' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern
Lucy (Class Teacher)
What do you see as the opportunities for learning at Forest School? [Describing the Eagle Eye game]…everyone wants to have a go and everyone wants to be the one who has to catch everybody so it turns into more of a learning experience there where they have to make sure they are not caught so when they are coming down to get to the tree am you know they have to do it in such a way that they are not seen (Lines 27 – 31) *Describing a child engaging with land art* …getting big, big you know extra big like extra-long branches off trees like thick ones … he actually ended up making sort of a boundary around everybody else (Lines 62 – 65)
Tom (Special Education Teacher)
What do you see as the opportunities for learning at Forest School? …but then for those children who ah might have challenges with literacy or maths or things like that they tend to really shine in the outdoors because it is something that am that is kind of not as academically focused and it is pinpointing you know different competencies and you know different strengths am and the children really get to show off their true potential (Lines 28 – 34) *Concerning a perceived lack of independence in children generally, Tom commented:* …I really do see them they are taking the sensible risks and they are trying things out that they would not normally try they are not looking for guidance as much (Line 118 – 120)
Anna (Parent)
Describing the impact that the skill of coping with dogs at Forest School has had on her child: they want it [Forest School] and they want to be there so they, the desire to be there supersedes the previous fear of a dog and the coping mechanism of crossing your arms and saying 'Madra, Madra' when you see a dog has equipped them and given

them a toolkit in terms of how to survive and to cope in a situation like that (Lines 219 – 224) *Later in the interview, Anna added:* I think Forest School is absolutely learning as fun. And I think if children are happy and relaxed the confidence comes through, they'll take risks, they'll assess situations, they won't be second-guessing things am and they can actually fully immerse themselves in it (Lines 294 – 297)
Rosie (Parent)
Describing an experience as a parent volunteer: Or they try something lots and lots of times, like one of the little fellas in the first group that I was in he had it in his head that he couldn't swing on a tree. And by the end of the eight or ten weeks, he'd figured out the different things that had been like really tricky at the beginning and just his sense of fulfilment from that you could really sense it (Lines 514 – 517)

Part 4: Thematic Analysis

Theme	Subtheme(s)	Key Quotes
Growth and Development	Competence and Confidence Managed Risk Taking Scaffolding	*When asked if she had observed opportunities for the children to experience a sense of achievement Lucy commented:* Yeah I would in the sense that maybe they might set off with a task going I am not really sure what I am doing and you know might have been sort of kind of lingering a bit. And you go; Are you ok? Do you need help? And they go I'm not really sure and then all of a sudden, they get it. *Anna elaborated on the impact of the coping mechanism around dogs learned through Forest School:*…because they have done Forest School and through Forest School they have got that coping mechanism and they have embraced that coping mechanism and learned and remembered it because they want to stay in Forest School so they don't… that supersedes the fear of the dog that they are now able to be up [FS site] without a care in the world. *When asked if she had seen any benefits to participation in Forest*

		School Rosie stated: Oh absolutely. You know I think the main thing that I would have noticed is that there are some children who excel in the school environment and there are some children who don't and then you know you bring them somewhere new and then the children who maybe are having a tough time with different things going on in the classroom you bring them outside and they get that chance to kind of shine in their own environment or they learn something new about themselves. *Tom also referred to children whom he felt experienced greater competence in outdoor activities:* …then for those children who ah might have challenges with literacy or maths or things like that they tend to really shine in the outdoors because it is something that am that is kind of not as academically focused *Anna commented on the increased confidence she has seen:* I think Forest School is absolutely learning as fun…and I think if children are happy and relaxed the confidence comes through *When asked about opportunities to experience a sense of achievement Tom commented:* So it really benefits the children it brings the best out in them and because of that it is just something they are looking forward to every week *Rosie commented on observations of increased mastery:* And you know you can kind of nearly see them growing through the process you know like it can be quite inspiring for the kids to be in that environment where there's such active learning going on and like so many kind of eureka moments when they're asked to do a task or something and they figure out they can do it themselves.

		Tom referred to increased mastery in physical skills during Forest School: There would be children, for example, just thinking off the top of my head, that we are working with this year that would have significant problems or would have had significant problems with movement and with their coordination and their balance and things like that and they just seem to thrive in Forest School. *Anna referred to trusting the leaders that they will ensure the children are appropriately dressed:* But I know from being up there and seeing them that say they'll often be like well it's up to the children from an empowerment perspective and for them to have the independence *During Sadie's child conversation she demonstrated the independence Anna spoke about:* Sadie: I think it might be raining…Researcher: Oh, I think it might – a little bit – does that matter? Sadie: No we're wearing our raincoats. *Sadie also commented on picking nettles, a skill associated with Forest School:* And how did you feel about picking nettles? Sadie: Well I picked a few but I had gloves…And I think there's one side that you can pick without getting stinged. *Rosie commented on the role of the adults in creating space for the children to develop competence:* …then am just I suppose pitching lessons to where the children are at but trying to ensure you know that you are bringing them on that bit you know using your whatever zone of proximal development or whatever you know trying to bring them on… but from where they are at, wherever or whatever they are at, at that time.

		Tom commented on observing children to promote increased mastery: You also get to see maybe you know if there are children who are struggling socially or who are struggling in terms of their movement or you know other areas or really bring them on. *From your perspective how do you think the children felt about Forest School?* Rosie:…then they found that in that kind of an environment where there's lots of twigs and you've to be careful, you can run around, but you just have to be watching everything, you know, found that a little bit tricky *Describing if those challenges changed over time or if they remained;* …well there was another child in the first group who was basically nearly afraid of everything and am you know was afraid to climb on the trees, was afraid to swing through the trees, afraid that he would hurt himself all of the time, you know, and any little cut would have to have a plaster on but by the end of the block, there was huge improvements, you know, in just taking risks. Like I mean they weren't huge risks by any matter or means, but relative to where that child had been at *Rosie described a child she observed that developed greater physical competency over time;* But over time got more used to, you know, taking his time on the rocks, being careful because you know, he didn't necessarily see the risks and just walked into things at the beginning. But then over time became much more aware of the boundaries… He seemed to be getting more of a handle on where his body was at, but then the environment at the beginning he was finding quite challenging.

		Tom associated risk-taking with the development of children's social skills; I think that is something that Forest School seems to really address because you know it's giving children the opportunity just to take sensible risks
Structure	Boundaries Plan	*Lucy describing the physical boundaries of a base camp;* …because the other adult had done it already so she kind of knew the layout and the set up. But even setting up the boundaries and doing you know all where the toilet was and all that type of thing *Rosie commented on social boundaries or rules;* Rosie: So you just have to be aware of boundaries and make it very clear that the boundaries are set at the beginning *Kate described the purpose of the mats in her picture;* Sometimes we do it to talk and to talk about what we're gonna do and then we get off them and start doing what we are talking about
View and Experiences of Forest School	Attitude Towards Forest School Engagement in Forest School	*Lucy described the children's engagement in setting up the base camp;* Even setting up the boundaries and doing you know all where the toilet was and all that type of thing the kids were really, well, enthusiastic Researcher: About it? Lucy: Yeah, they had really enjoyed it *Lucy describing one child's engagement in an art activity;* He kind of found a bit I'm not really sure what I am doing here, I'm not really sure what the outcome is going to be but I'm just going to keep going

		anyway and I'd say then he got a lot out of it personally for himself.

Part 5: Summary of Proposition 2 Findings in Case 1

The data related to Proposition 2 in Case 1 were analysed in accordance with the criteria outlined in Part 1 of this section. Analysis of the perceived competence subscale of the Basic Need Satisfaction in Forest School scale showed that participants perceived competence was positively correlated with intrinsic motivation. This is interpreted as an association between feelings of competence and engagement and enjoyment in Forest School.

Pattern matching logic applied to the child conversations and interview responses linked opportunities to experience increased mastery with engagement and enjoyment. Pattern-matching logic applied to Kate's response to a question about what she might do at Forest School linked the ability to make a "conker person" with a sense of "fun" (Part 3.1). Sadie's response to the same question also linked a sense of increased mastery with enjoyment, linking finding "the perfect spot up on the rocks" with enjoyment of the game Eagle Eye (Part 3.1). Lucy, the class teacher, also commented on Eagle Eye, linking enjoyment with increased mastery, "everyone wants to have a go…so it turns into more of a learning experience there where they have to make sure they are not caught" (Part 3.2). Rosie recalled an experience where a child "figured out the different things" that had made swinging on a tree difficult and observed his "sense of fulfilment" from that experience (Part 3.2).

Risk for the younger children was linked to the terrain, including the "rocks", and risky play activities including climbing trees and carrying "extra-long branches" (Part 3). This type of risk was recognised by the adults but not commented on by the children, emphasising the role of more explicit risk. Instead, the children's responses connected feelings of increased mastery with creative activities that involved making something and playing games, such as finding "the perfect spot" to hide on the rocks (Part 3.1). A parent in Case 1 gave a specific example of how her child learned a "coping mechanism" through Forest School to manage her fear of dogs. Anna described how she developed "a toolkit in terms of how to survive and to cope in a situation like that" and was able to transfer it to other situations (Part 3.2). Engagement was linked with fun, determination, and participation across both cases.

Themes and sub-themes related to this proposition indicate that the participants had opportunities to develop feelings of competence and confidence at Forest School. Both Rosie and Tom referred to the different skills and activities associated with

outdoor learning and commented on feelings of competence this can give the children in their view. Rosie described how Forest School provides children who may struggle in the classroom with a "chance to kind of shine in their own environment or they learn something new about themselves" while Tom associated the opportunity to "shine" with the outdoors because it is "kind of not as academically focused" (Part 3.2). Anna commented on the children being given the responsibility to layer clothing up or down based on how they feel and recognised the value "from an empowerment perspective and for them to have the independence", while also acknowledging parent concern that they might be cold or get sick (Part 4). Sadie, one of the children, referenced that acquired skill when she commented that the rain didn't matter because "we're wearing our raincoats" (Part 4).

Appendix Z Case 1 Analysis of Proposition 3

Proposition 3 hypothesises that children will associate opportunities to develop relationships, with peers and leaders through play and teamwork, with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 3 for Case 1.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 3. Part 2 outlines the scale data relevant to this proposition. Part 2 documents correlations between the 'Relatedness' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between relatedness and motivation. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 3, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 3.

Part 1: Criteria for Interpreting Proposition 3

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School	The perceived relatedness subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation.	Pattern-matching: Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders, through working and playing together, with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to developing relationships at Forest School	Pattern-matching: Interview responses that link opportunities the children have had to develop relationships with peers and leaders, through working and playing with others, with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to developing relationships at Forest School

Part 2: Scale Data

The relationship between perceived relatedness (as measured by the Perceived Relatedness subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was a strong, positive correlation between the two variables, rho =.753, n =16, $p < .01$, with high levels of relatedness associated with higher intrinsic motivation.

The 8 individual items from the 'perceived relatedness' subscale with mean scores and standard deviations are outlined in Table Z1 below to provide greater insight into children's responses.

Table Z1

Case 1 Perceived Relatedness Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
I really like the people I interact with at Forest School	6.19	1.11
I get along with people at Forest School	6.44	.96
I pretty much keep to myself when I am at Forest School (R)	5.00	2.25
The other people at Forest School are my friends	6.63	.89
People at Forest School care about me	6.06	1.24
There are many people that I am close to at Forest School	6.13	1.63
The people I interact with at Forest School seem to like me	6.56	.81
People are generally pretty friendly towards me at Forest School	6.63	.80

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived relatedness. Table Z1 above shows that mean scores for all seven items were above '4'.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table Z2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table Z2

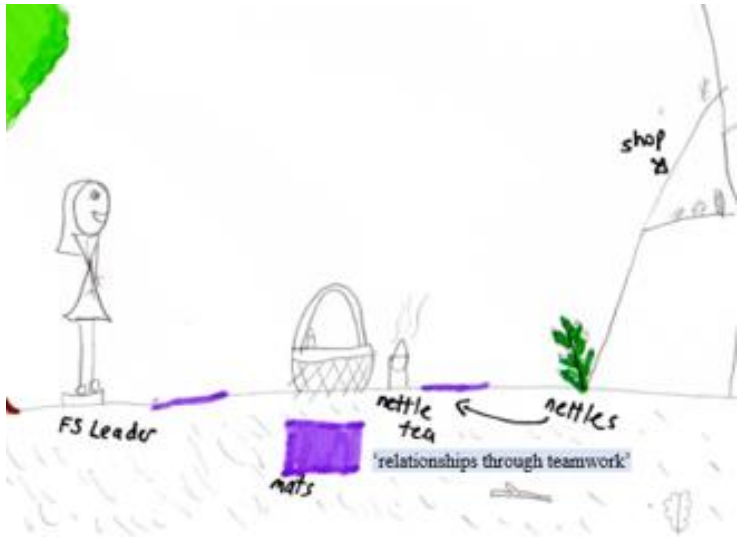
Case 1 Intrinsic Motivation Subscale

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.25	.68
I enjoy going to Forest School	6.56	.63

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria
Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through play or working together with a sense of engagement and/or enjoyment, or the opposite Pattern-matching codes applied: ‘relationships through play’ ‘relationships through teamwork’ ‘engagement and/or enjoyment’ Underlined text shows data that contradicts the predicted pattern

Kate	
Describing the wild tea that she included in her picture: I think like we all agree on a plant we can make tea from and then work together to pick them and then we put them in and let it rest for a while and then when it's lunchtime we pass out the tea. [Is there a lot of working together in Forest School?] Yeah there is quite a bit	

Sadie

What's free play?
It's when we can go around the base camp and play with each other

What do the adults do at Forest School?
They look after us and they help with the tea
… they helped with making our necklaces

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through play or working together with a sense of engagement and/or enjoyment, or the opposite Pattern-matching codes applied: 'relationships through play' 'relationships through teamwork' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern
Lucy (Class Teacher)
What do you see as the opportunities for learning at Forest School? … even working from the group … working together gets things done quicker rather than standing back and watching everyone else do it am and the children maybe who you see in class who maybe don't particularly adapt well to sitting for very long and you can see their mind kind of drifting and wandering that's the environment within the context of the forest that suits them more. You see the kids who really, really love nature and really feel connected and who just love being out (Lines 33-44)
Tom (Special Education Teacher)
Describing ways the children develop relationships with others; I find now in a classroom context, for example, you could you know spend a whole year teaching them to work in groups (Lines 131 – 133)… whereas I find for whatever reason in FS when they are asked to work in groups they will organise themselves into groups straight away and then they will all muck in and they will all take part (Lines 141 – 143)
Anna (Parent)
What is your understanding of what the children do at Forest School? the social and emotional learning and I think that's massive in Forest School because its taking people out of the traditional classroom environment and adapting the same principles of sharing, turn-taking you know respect awareness kindness for each other (Lines 89 – 92) working together, problem-solving, as teams and as individuals (Line 120)
Rosie (Parent)
Are there any benefits that you, as a parent, would see to Forest School? …you know they make these friendships with people because the group is limited so you've ten people in the group let's say, they're put with a different group of people so they're outside their comfort zone let's say so they are kind of navigating friendships and for me, as a parent, it was lovely to see all of the different children and how they interact (Lines 156 – 161) *Do you feel Forest School offers different opportunities for learning?*

but a lot of the time there will be more group work involved, so it's kind of negotiating that as well for some of the children that might have been a little bit tricky (Lines 348 – 350)

Part 4: Thematic Analysis

Theme	Subtheme(s)	Key Quotes
Building Relationships	Relationships with others Different perspectives Facilitating social connections	*Kates drawing illustrated elements associated with playing with others; What's this part here that you've drawn?* It's like the rocks that's where the boys made their small shop *Kate:* The girls are all usually doing their things *What sort of things might they be?* *Kate:* Like C4, C5 and Sadie they're making like a small hospital in case you like get a cut they can like make some hospital materials out of nature *Similar to Kate, Sadie also described how making wild tea is a team activity:* We put some plants and we put it in a teapot and we put boiling water on it and we let it set and then we use a sieve to put it in these little cups. *Lucy, the class teacher, described the changes she had noticed in one pupil's engagement in teamwork:* But gradually as the weeks have gone on I have seen him been more willing to get involved with the group, be it two or three kids, that he is not always letting them do the work. *When asked about the opportunities to develop relationships in Forest School, Tom commented on engaging with peers in teamwork:* And when they are asked to work in groups,

		they just organise it themselves and they all get stuck in. *Tom also spoke about the impact of Forest School on children's social skills:* …Social skills are as well, children are finding very, very difficult now. I think we would have been, when we were in primary school ourselves, you would have been spending more time outside of school and in school playing with, you know, playing with children, sorting out your own problems but I think now whether it's because the number of children in families is getting smaller that there isn't that contact with other children and the fact that life has become a lot more insular as well in that you know children aren't going outside and playing with one another that you know the social skills aspect of it has become very, very challenging. And I think that is something that Forest School seems to really address. *Rosie, a parent, also noticed the impact of playing together on friendships:* And having fun, new games, like a lot of the children nowadays I suppose would have small families, maybe limited opportunities for being with peers outside of school or other children. You know, nowadays children don't really play so much outside on the road or things like that. So opportunities to build up those friendships I think is great, you know within the class. *Rosie spoke about the impact of the small group on adult-child relationships in her experience as a volunteer:* You know there's two adults with them there are more opportunities…and because of the fact that you're staying with the same group, you get to know them better.

		Is there anything else you feel is important? [comparing Forest School to Beach school]….You're talking about a methodology I suppose where you're bringing the children out, and it's active and they're out in the environment and building vocab and building relationships. So all of these same things. *Anna, a parent, commented on the relationship between the children and the teacher (leader):* And it's down to like I believe the impact of a teacher is massive so like I've seen with my own children the difference of having one teacher over another and it's not in terms of a popularity contest but it's in terms of connectivity so if a child connects…so if you connect with a good teacher you make learning fun and am I think Forest School is absolutely learning as fun. *When asked if 'there are there any other important things that adults at Forest School do' Kate related the leader's role with supporting peer relationships:* Um….I think….um…I think maybe C7 and C8 get to be together a lot but C8 is kind of helping in the shop
View and Experiences of Forest School	Links Beyond Forest School	*Teachers and parents referred to the children sharing their experience at Forest School with their families:* *Lucy:* And when they are out again with their parents or they might have a younger sibling and they might suggest let's do this and it's something that they've learned and they do probably without realising it bring what they have experienced within the group bring it to outside the group in terms of their family time and even their back garden and it naturally kind of follows on.

		Tom: what you find with Forest School you have children who would have been very indoorsy coming and saying, you know, I brought my mum or I brought my dad up to the forest and you know we show them base camp, we did. We showed them where our base was and gave them an example of what we were doing, and I think that is a very positive outcome. *Anna:* And what I've also done with both of them and this has been child-led is we have as a family gone and done Forest School with the children being the sort of leader and all of us being the group. *Rosie:* But am it's great to have that support there [parental support] and a lot of the kids would talk about how after they're been to the forest school session that, that weekend they went back and they were showing their mum or their dad am their den.

Part 5: Summary of Proposition 3 Findings in Case 1

The data related to Proposition 3 in Case 1 were analysed in accordance with the criteria outlined in Part 1 of this section. Analysis of the perceived relatedness subscale of the Basic Need Satisfaction in Forest School scale showed that participants perceived relatedness was positively correlated with intrinsic motivation. This is interpreted as an association between feelings of relatedness and engagement and enjoyment in Forest School. This pattern was largely reflected in the qualitative analysis.

Pattern matching logic applied to the child conversations and interview responses linked activities that involved teamwork and play with opportunities to develop relationships in Forest School. The majority of participant responses linked Forest School with opportunities to engage with peers and to work together on tasks and activities. Kate included making tea as an important activity in her picture and spoke about how they "work together to pick them [the leaves]" when describing what she had

drawn (Part 3.1). Kate mentioned that “we all agree on a plant” (Part 3.1), illustrating the development of social skills such as compromise. Tom (SET), linked how the children will “organise themselves into groups” with engagement, “they will all muck in and they will all take part” (Part 3.2). Rosie (parent), commented that “negotiating” groupwork “might have been a little bit tricky” for some of the children she observed, suggesting that navigating relationships was not easy for all children. However, she observed that it was a skill that developed as the sessions went on. This suggests that shorter blocks of sessions may not be as conducive to the development of relationships.

Themes and sub-themes related to this proposition indicate that the participants had opportunities to develop relationships with others at Forest School. Relationship with others included relationships with peers and with adults. Participants associated. Both Tom (SET) and Rosie (parent) referred to what they see as diminishing opportunities for children to play together, “whether it’s because the number of children in families is getting smaller that there isn’t that contact with other children and the fact that life has become a lot more insular” (Tom, Section 4). They saw Forest School as an opportunity to develop relationships with peers through play, with Rosie referring to “opportunities to build up those friendships” as “great” (Section 4). Anna spoke about the importance of “connectivity” in terms of engagement. From her perspective the attachment that a child developed with the teacher was important and this was something that appeared to be addressed at Forest School; “if you connect with a good teacher you make learning fun and am I think Forest School is absolutely learning as fun” (Part 4).

Appendix AA Case 2 Analysis of Proposition 1

Proposition 1 hypothesises that children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 1 for Case 2.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 1Part 2 documents correlations between the 'Autonomy' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between autonomy and engagement. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 1, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 1.

Part 1: Criteria for Interpreting Proposition 1

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to make choices about the activities they engage in and self-direction within activities with a sense of engagement and enjoyment at Forest School.	The perceived autonomy subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation	Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about the activities they engage in at Forest School and choices about how they execute activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School	Pattern-matching: Interview responses that link opportunities to make choices about the activities a child engages in and choices about how they execute those activities with a sense of engagement and enjoyment or the opposite Thematic analysis: Themes within the data set that refer to autonomy at Forest School

Part 2: Scale Data

The relationship between perceived autonomy (as measured by the Perceived Autonomy subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was no significant correlation between the two variables.

The mean scores and standard deviations for the 7 individual items from the 'perceived autonomy subscale' are outlined in Table AA1 below to provide greater insight into children's responses.

Table AA1

Case 2 Perceived Autonomy Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
I feel like I am free to decide for myself how I do things at Forest School	6.5	.77
I feel pressured during Forest School (R*)	6.7	.82
I can tell people my ideas and opinions at Forest School	6.4	1.16
At Forest School I often have to do what I am told (R)	5.5	1.35
People at Forest School tend to take my feelings into consideration	6.2	1.08
I feel I can pretty much be myself when I am at Forest School	6.6	.90
There are many chances for me to decide for myself how to do things at Forest School	6.5	.84

* Reverse Scored Item

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived autonomy. Table AA1 above shows that participants' mean scores on all seven items were above '4'.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table AA2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table AA2

Case 2 Intrinsic Motivation Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.2	.76
I enjoy going to Forest School	6.3	.73

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria	
Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about what tasks or activities they engage in at Forest School (choices between activities) and choices about how they execute those tasks or activities (self-direction) with a sense of engagement and enjoyment or the opposite Pattern-matching codes applied: 'choices between activities' 'self-direction' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern	
Finn	
R: *And how does it feel when you're in Forest School?* Finn: Well, like you could kind of do whatever you want. So you can kind of do stuff you wouldn't be allowed to do. So, like, you know, free, being able to run outside.	N/A

Robyn	
And I noticed you put the fire and the fort here. Is there a choice about what activities you engaged in or was everybody doing these activities together? Robyn: I mean like we split up into three groups and then we all did our own version of what we were told to do [lack of choice]. So like today we were told to make [lack of choice] these tepees. So we made our own version of the tepees cause like Jack gave a demonstration of how to make it and then we made them on our own. So like my friends' group made cool ones that was like really waterproof.	

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Pattern-matching: Interview responses or elements of drawings that link opportunities to make choices about what tasks or activities a child engages in at Forest School (choices between activities) and choices about how they execute those tasks or activities (self-direction) with a sense of engagement and enjoyment or the opposite Pattern-matching codes applied: 'choices between activities' 'self-direction' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern
James (Class Teacher)
Describing what he saw as the opportunities for learning at Forest School; And, and it's great to see what activities they engage with, especially when they had choice over it, and they had a lot of choice. And it was very interesting to see what they were drawn towards because you know, given how different it is in the classroom, there was very little I could have predicted. (Lines 95 – 97)
Eleanor (Parent)
How do you think your child feels about Forest School? "maybe you know being quite self-directed as well with what they, with the tasks they were doing and obviously that was something to do with the way it was facilitated by the leaders. So obviously, you know, whatever they needed to do to facilitate that experience for her was very positive. (Lines 25 – 29)
Beth (Parent)
Following up on an earlier comment she made about 'playing' Beth commented; I know. Just playing. Yeah. I mean, I mean they're not like playing games as such, but like even just splashing water at each other or splashing mud at each other, it's still fun. It's still playing, you know, and that kind of thing. (Lines 141 – 144)

Part 4: Thematic Analysis

Themes	Subthemes	Key Quotes
Freedom and Choice	Child-centred approach Choice Different space	*Finn describing his experience of Forest School;* [*And how does it feel when you're in Forest School?]* Finn: Well, like you could kind of do whatever you want. *James, the class teacher, describing how the leaders adapted the plan in repose to the group:* And also I saw that, ah, Eve and Jack [Forest School leaders] had become aware of how the dynamic was different, so the activities had been, uh, tweaked for want of a better word for the afternoon group compared to the morning group. *James describing the children having opportunities to follow their interests:* And it was very interesting to see what they were drawn towards because you know, given how different it is in the classroom, there was very little I could have predicted. *James giving an example of how the Forest School leaders followed children's initiative:* Am but actually in the afternoon, just today there was a bit of improvisation went on as well. Am, for example, when a child, no two children got the idea to make a, make a swing and then another child saw it and he did his own swing and it came up that there was a child who knew how to make a ladder, so she got to make a ladder with another girl. So these were things that hadn't happened in the morning but just based on these children's interests and existing skills from scouts and things like that, it was worked into the afternoon. *James commented on observation and following the children's lead:*

		Yeah, they [Forest School leaders] were always open to going with it. I think that it must be part of the approach of the Forest School that they would observe a lot of the time and just see what direction does this group want to go in. *Eleanor commented on the children directing their learning:* If they can start directing their learning then they can decide to do something and to carry that out. *Eleanor continued* that kind of self-direction is just fantastic for children because you know, so much of the curriculum is actually, you know, they're told, you know, they're been given work all the time to complete and that suits maybe some children, but for some children when you know that's not their forte and actually being more self-directed in what they do can actually really help their confidence. So, yeah, and like she loved that. So ah that would've been it. I mean, when they do it in Scouts it's more, I think it's not as self-directed, you know, it's kind of more they are told what to do whereas with this is seemed to be more led more by the kids themselves *Finn described different choices at Forest School compared to the yard:* Finn: Yes. Like I guess you couldn't play football in the woods or basketball, but in the same way, you couldn't make a hammock in the playground out there or knock each other off ropes *When asked about the children's opportunities to direct their learning at Forest School James commented:* Ah, yes. I believe so. I mean, it wasn't just 'a' or 'b'. A lot of the time they had three or four options. Sometimes, you know, you could, there's a, there's

		a fear of option paralysis that ‘a’ it sounds great to have plenty choice, but option paralysis is something that I think is, ah, something that's overlooked. And I thought it was good to have a limited number of choices, but there are plenty of choices. They had three or four and that was enough. *Robyn commented on having opportunities to be more creative in Forest School:* [When you say creative, what do you mean by that?] I don't really know. Like maybe working on it with your friends is fun and you got to like choose what you want to do with it. *Robyn described how each group made their own version of the tepees or shelters:* So like say with our tepees today we decided to make it like loads of like leaves at the top so that I would say dry underneath. I didn't, because there was a few holes inside but that was just a first draft like. And we didn't have much time for it but I think it's just being able to do your own things with it. *James referred to a boy who chose to adapt a creative activity, making a necklace, to include lots of wooden discs as opposed to just one:* You know, they were only doing one, but he decided to make it into a whole necklace. So he pretty much spent nearly one whole session just doing that. <u>Lack of Choice</u> *Robyn referred to making the shelter as something she had to do:* Like you have to do a little shelter. And then you put a, you had to make it waterproof

		Robyn also interpreted the shelter activity as something that the group was told to: So like today we were told to make these tepees.
Being Outdoors	Affordance of nature	*Finn gave some examples of how natural materials were used in open-ended or creative ways by the children:* We put leaves in to kind of act like a pillow Yeah like in the forest… Like here [school] you have a playground and it's an empty space yet. Like running around, doing basketball. There you've trees, you have ropes to knock each other off, you've sticks. You have to like to make… you make yo own playthings any way you want. *Robyn described the fort or shelter building activity as an activity made possible by the types of materials available in the woods:* And then the fort that we were doing today with like the leaves. *She described the types of materials that they used to try to make the shelter waterproof:* You keep putting like sticks, twigs, leaves and ivy on it to make it like waterproof or able to stay in it. So it's like a DIY tent. *Robyn spoke about the sense of space outdoors;* It's much more fun cause it's kind of like cramped inside the classroom where you can't move around a lot and you have to like be a stick to get past tables and stuff.

		She continued: Whereas you're able to like run around in the Forest School and like hardly ever hurt yourself or like bump into people like you would in the classroom. Like in the classroom you have to ask your friends to move so you can get to the next part of the classroom, whereas there you can just like walk around the whole space.
Views and Experiences of Forest School	Attitude towards Forest School	*Finn described the feelings he associated with making the shelter waterproof;* Researcher: And how did it make you feel when it worked? Finn: Well like very happy because I had made it

Part 5: Summary of Proposition 1 Findings in Case 2

The data related to Proposition 1 in Case 2 were analysed in accordance with the criteria outlined in Part 1 of this appendix. Analysis of the perceived autonomy subscale of the Basic Need Satisfaction in Forest School scale indicated that participants perceived autonomy was not significantly correlated with intrinsic motivation. However, when descriptive statistics for the seven individual items were examined all responses indicated relatively high perceived autonomy.

Pattern matching analysis across the child conversations and the interviews with teachers and parents linked opportunities to make choices between and within activities with a sense of engagement and enjoyment. There was more emphasis on self-direction within activities than choices between activities in responses in Case 2. This replicated the patterns in Case 1. Although the class teacher perceived that the children got "a lot of choice" (Part 3.2) between activities this was not echoed by one of the children, Robyn. She commented on how different groups did their "own version" of what they were "told to do" (Part 3.1). She appeared to interpret demonstrations of skills as a direction to try out those skills. Although Robyn's creativity and engagement with the task suggest the perceived directiveness did not thwart her motivation, in terms of delivery of skills-based activities this is an important consideration going forward.

Themes and sub-themes related to this proposition in Case 2 also indicated that the participants' sense of autonomy was related both to social elements of Forest School (e.g. child-led experiences and a different space) and elements of the natural environment (e.g. affordances of nature). Forest School was recognised as a different learning space by Eleanor, set apart from the school curriculum where "they're been given work all the time to complete" and a different behavioural space by Finn, where you could "do what you want" (Part 4). In Case 2 James (Class Teacher) was in a position to observe two different FS groups. He described how the leaders recognised that the "dynamic was different" in each group and used their observations to "see what direction does this group want to go in". The activities were then "tweaked" based on the children's interests (Part 4).

In Case 2 the natural materials available were associated with engagement, evident in the children's creativity. Finn described the affordances of the natural environment when he explained how you can "make your own playthings any way you want" (Part 4). In contrast to the 'empty space' of the schoolyard, at FS "you've trees, you have ropes to knock

each other off, you've sticks" (Part 4). Robyn referred to the use of "sticks, twigs, leaves and ivy" for building, enabling them to "choose what you want to do with it" (Part 4). Space was also associated with a sense of freedom for the children in Case 2. Compared to the classroom Robyn described how she could "run" or "walk around the whole space" (Part 4).

Appendix BB Case 2 Analysis of Proposition 2

Proposition 2 hypothesises that children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 2 for Case 2.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 2. Part 2 documents correlations between the 'Competence' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between perceived competence and engagement. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 2, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 2.

Part 1: Criteria for Interpreting Proposition 2

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to take appropriate risks and experience increased mastery of skills and activities with a sense of engagement and enjoyment at Forest School	The perceived competence subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation.	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School	Pattern-matching: Interview responses or elements of drawings that link taking risks or increased mastery of skills or activities with a sense of engagement or enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to increased competence at Forest School

Part 2: Scale Data

The relationship between perceived competence (as measured by the Perceived Competence subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was a strong, positive correlation between the two variables, rho =.771, n =19, $p < .01$, with high levels of competence associated with higher intrinsic motivation.

The 6 individual items from the perceived competence subscale with mean scores and standard deviations are outlined in Table BB1 below to provide greater insight into children's responses.

Table BB1

Case 2 Perceived Competence Subscale

Item	**Mean**	**Standard Deviation**
I often feel good at doing things at forest School	6.79	.54
People at Forest School tell me I am good at what I do	6.10	1.29
I have been able to learn new interesting skills at Forest School	6.42	.90
I feel a sense of achievement form what I do at Forest School	6.47	.90
At Forest School I get a chance to show how well able I am	6.68	.75
I often feel well able to do things at Forest School	6.74	.56

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived competence. Table BB1 above shows that mean scores for all six items were above '4'.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table BB2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table BB2

Case 2 Intrinsic Motivation Subscale

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.2	.76
I enjoy going to Forest School	6.3	.73

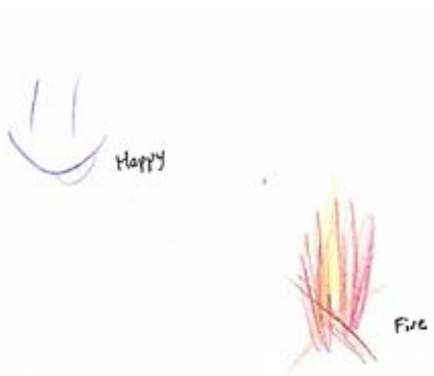
Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

<table>
<tr><td colspan="2">Pattern Matching Criteria</td></tr>
<tr><td colspan="2">Interview responses or elements of drawings that link a sense of competence through taking risks or increased mastery of skills or activities with a sense of engagement and/or enjoyment, or the opposite
Pattern-matching codes applied:
‘risk’

‘increased mastery’

‘engagement and/or enjoyment’

<u>Underlined text shows data that contradicts the predicted pattern</u></td></tr>
<tr><td colspan="2">Finn</td></tr>
<tr><td>C: Well I like a challenge like if it was all easy
there would be no fun.
R: Okay. So parts of it are challenging?
C: Yeah.
R: What would be challenging for you?
C: Well, like I remember the first time of the flint and steel I was there for ages, like trying to make it spark and then I was able to get spark and then I was like, yay, I can light a fire.</td><td> 
</td></tr>
</table>

Robyn	
So like say with our tepees today we decided to make it like loads of like leaves at the top so that I would stay dry underneath. I didn't, because there was a few holes inside but that was just a first draft like. And we didn't have much time for it but I think it's just being able to do your own things with it.	

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link a sense competence through increased mastery of skills or activities with a sense of engagement and enjoyment, or the opposite Pattern-matching codes applied: 'risk' 'increased mastery' 'engagement and/or enjoyment' Underlined text shows data that contradicts the predicted pattern
James (Class Teacher)
Concerning opportunities to experience a sense of achievement James stated; One of the most challenging ones I would say, well for certain children, definitely, the most challenging one was they were using the sparker tool for lighting the fires and there were some of them and, you know, I must have seen them do it a hundred times and they weren't getting it, but I didn't see anyone give up and they did get there eventually. So that's just something that stands out. (Lines 142 – 146)
Eleanor (Parent)
I suppose you've mentioned just sort of two things that stood out to me about the opportunities to cooperate and also that piece about self-directed learning. Can you tell me a little bit more about these? Yeah, I mean it's very hard to quantify those kinds of things, but I mean, you know, I've seen the pictures. So I have seen my daughter has been quite industrious am in the pictures. You know, she's obviously doing something, taking the lead on some activity and then executing a task, so, you know, I imagine that that would be very good from a confidence… (Lines 102 – 107)
Beth (Parent)
Describing her daughter's experience of learning to make fire with flint and steel; So now she's going to go back to her scouting troop and tell them that they use that to make the fires because she thinks that's a lot more, um, a better, a better way to do it because they use matches in Scouts. And sure if it's too windy and you know, they burn down quite fast and things like that. So she's really excited to go back to Scouts after Christmas and tell them to use the flint and steel idea. (Lines 30 – 36)

Part 4: Thematic Analysis

Theme	Subtheme(s)	Key Quotes
Growth and Development	Competence and Confidence Managed Risk Taking Scaffolding	*Expanding on the sense of increased mastery from the fire lighting* Finn:…And then it was like another while trying to get the spark to light the cotton wool and then there's like slowly making the things that are harder, easier and learning more, learning more or like stepping up the levels until you get it. *Finn described the gradual increase in perceived competence;* Finn: Yeah. Like first you learn how to strike when making fire. Then you learn how to catch the cotton. Well, then you know how to make it catch to cotton wool to wood and then make big fires. *James described engagement in a challenging creative task, threading a wooden disc;* So, one guy who I wouldn't associate, I wasn't aware of any interests he had in anything like this, but he just, after doing one, and it took him a long time, he's a child who, he was diagnosed with dyspraxia, so this would have been extra challenging for him. But once he got one and it took a while, he just kept going. You know, they were only doing one, but he decided to make it into a whole necklace. So he pretty much spent nearly one whole session just doing that. *Finn describing the skill of building a waterproof shelter;* It was actually, it was comfy in there. We put leaves in to kind of act like a pillow. And it was just really surprisingly warm. Like inside you could see up and it was kind of all dark and I was thinking ok this is waterproof there's no light coming through.

		When asked how he felt about learning outdoors, Finn expanded on the skills developed; Oh, we do learn some really cool stuff cause like, am, last week we did like the thing where you had to make a shelter to keep out the water. And to think like it'd be useful like if you like know how to do these. Kind of like if you go camping. *Eleanor expressed that FS allowed her daughter to display competencies that may not come to the fore in the classroom;* And she also does have some literacy issues like dyslexia and things like that, but, you know, again, every child, you know, their strengths are going to lie in different areas. So I mean, my daughter would probably naturally be quite good at tasks. Her skills would probably lend themselves to Forest School if you like, you know, she'd be quite interested in building a shelter for example. *Finn described how ropes gave a sense of risk;* Well like we built like one little underneath and another rope on top and like you'd be standing on the rope underneath and you'd hold on the rope on top and you'd have to try shake each other off. Researcher: Is that something you enjoyed? Finn: Yeah. Researcher: And what is it about that? Finn: It's dangerous. *Robyn linked increased as opposed to total mastery with enjoyment when she described her experience using fire;* I just found it a lot of fun where we like put the flint and steel onto the

		cotton wool and made it like go up in flames and we tried to keep it going. But it wouldn't really keep going cause we didn't have the right sticks for it, but it was still fun with just the cotton wool cause like that was the first time I'd ever used flint and steel. *Robyn later described how the Forest School leaders, in this case, Jack, engaged in scaffolding to enable them to develop their skillset;* Say if you got like a bad branch for your fire, then Jack would help you find where to find a good place to find the right branches for the fire. Like dry leaves or twigs. *When asked about the challenges of associated with Forest School Eleanor described how the challenge of dressing appropriately is a skill her daughter can develop;* The challenge is to dress appropriately and be aware of the weather conditions and all the rest of it. So, you know, she's getting quite good at that. So that was a challenge. But it's also something, you know, she can learn from, you know, preparing properly and am, wearing the right clothes so that you're comfortable for the day and having enough layers and all the rest of it.
Structure	Boundaries	*James (Teacher) observed the role of boundaries in setting different expectations;* And I got that impression when they were inside the enclosed area, they were using the open air for the games. But when they were in the more enclosed area, um, they would be told what options they had.

Views and Experiences of Forest School	Attitude towards Forest School	*Eleanor described her daughter's enjoyment;* I mean I can only guess but to me, the indicators are that if it's a positive experience I'll see it in her mood. So she comes home and she's in a very good mood and good form or you know, that she's happy and content and then I know that the experience has been. And so I'm guessing that that is because she is enjoying it. *Beth reflected that total mastery had not been necessary for her daughter to feel a sense of enjoyment;* She climbed into the den and they poured water over it and it wasn't waterproof. And she got soaked. But she really enjoyed that.

Part 5: Summary of Proposition 2 Findings in Case 2

The data related to Proposition 2 in Case 2 were analysed in accordance with the criteria outlined in Part 1 of this section. Analysis of the perceived competence subscale of the Basic Need Satisfaction in Forest School scale showed that participants perceived competence was positively correlated with intrinsic motivation. This is interpreted as an association between feelings of competence and engagement and enjoyment in Forest School. This is similar to the findings of the scale data in Case 1.

Pattern-matching logic was applied to children, parent and teacher responses to questions exploring opportunities for learning and opportunities to achieve in Forest School. Risk was emphasised by participants in Case 2 to a greater extent than Case 1. Finn, one of the children, recalled how the first time he attempted to light the fire he "was there for ages", and "then he [I] was able to get spark" and eventually was able to "light a fire" (Part 3.1). James (teacher) also alluded to fire as a "challenging" skill that took time to develop (Part 3.2). For Robyn, increased as opposed to total mastery was sufficient to support competence. Although the aim of the shelter, or tepee, was to "stay dry underneath" and she "didn't" she explained that it "was just a first draft" (Part 3.1). Engagement was linked with fun, determination to continue to develop skills and participation in the activities.

Subthemes associated with 'Growth and Development' in Case 2 included 'Competence and Confidence', 'Managed Risk Taking' and 'Scaffolding'. Although explicit risks, such as fire and ropes, were not used in Case 1, there was more emphasis in interview responses on risk assessment and management. Lucy, the teacher, commented on how the children remembered the concepts of the base camp and the boundaries from Senior Infants. In Case 2, James, the teacher, observed the boundary between the grassy space for games and the forest space where choices, including fire and rope use, were offered. Although Finn spoke about the ropes being "dangerous", he did not speak about how to manage that danger (Part 4). It was evident from the observations that the risks the children did engage in were being managed by the leaders. Eve, one of the leaders in Case 2, spoke about the pace at which risk was introduced due to length of the block of sessions and how she felt it needed to be slowed down to allow these risk assessment and management skills to develop (see Section 3.3.2.4). Regular sessions over a longer time may be more conducive to the transfer of this skillset from the leaders to the children.

There were examples of how scaffolding was used effectively by the leaders to support the children to develop skills. Robyn described how the fire “wouldn't really keep going cause we didn't have the right sticks for it”. As she and her peers became more competent using flint and steel to light cotton wool Jack helped them to find a “good place” to get “dry leaves or twigs” (Part 4). Help appeared to be offered as needed.

Appendix CC Case 2 Analysis of Proposition 3

Proposition 3 hypothesises that children will associate opportunities to develop relationships, with peers and leaders through play and teamwork, with a sense of engagement and enjoyment at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 3 for Case 2.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 3. Part 2 outlines the scale data relevant to this proposition. Part 2 documents correlations between the 'Relatedness' subscale of the Basic Need Satisfaction at Forest School scale and the brief 2-item measure of 'Intrinsic Motivation', interpreted as an association between relatedness and motivation. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 3, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 3.

Part 1: Criteria for Interpreting Proposition 3

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
Children will associate opportunities to develop relationships with peers and leaders, through play and teamwork, with a sense of engagement and enjoyment at Forest School	The perceived relatedness subscale of the adapted Basic Need Satisfaction at Forest School Scale will be positively correlated *(at the $p<0.5$ level)* with perceived intrinsic motivation.	Pattern-matching: Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through working and playing together with a sense of engagement and enjoyment, or the opposite Thematic analysis: Themes within the data set that refer to developing relationships at Forest School	Pattern-matching: Interview responses that link opportunities the children have had to develop relationships with peers and leaders through playing or working with others with a sense of relatedness and engagement, or the opposite Thematic analysis: Themes within the data set that refer to developing relationships with others at Forest School

Part 2: Scale Data

The relationship between perceived relatedness (as measured by the Perceived Relatedness subscale of the Basic Need Satisfaction at Forest School Scale) and perceived intrinsic motivation (as measured by the 2-item brief measure of Intrinsic Motivation) was investigated using Spearman rank order correlation coefficient. There was a medium, positive correlation between the two variables, rho =.479, n =19, $p < .05$, with high levels of relatedness associated with higher intrinsic motivation.

The 8 individual items from the 'perceived relatedness' subscale with mean scores and standard deviations are outlined in Table CC1 below to provide greater insight into children's responses.

Table CC1

Case 2 Perceived Relatedness Subscale Descriptive Statistics

Item	**Mean**	**Standard Deviation**
I really like the people I interact with at Forest School	6.58	.77
I get along with people at Forest School	6.68	.58
I pretty much keep to myself when I am at Forest School (R)	6.68	.75
The other people at Forest School are my friends	6.53	.61
People at Forest School care about me	6.42	.70
There are many people that I am close to at Forest School	6.63	.50
The people I interact with at Forest School seem to like me	6.68	.48
People are generally pretty friendly towards me at Forest School	6.79	.42

Participants' responses for these items were reported using a 7-point Likert scale, from 1, 'strongly disagree' to 7, 'strongly agree'. Mean scores above '4' are interpreted as indicative of perceived relatedness. Table CC1 above shows that mean scores for all seven items were above '4'.

Means and standard deviations for two-items used as indicators of 'perceived intrinsic motivation' are reported in Table CC2 below. The mean score for both items is above '4', indicative of perceived intrinsic motivation in this context.

Table CC2

Case 2 Intrinsic Motivation Subscale

Item	**Mean**	**Standard Deviation**
Forest School is fun	6.2	.76
I enjoy going to Forest School	6.3	.73

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria	
Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through play or working together with a sense of engagement and/or enjoyment or the opposite Pattern-matching codes applied: 'relationships through play' 'relationships through teamwork' 'engagement and/ or enjoyment' Underlined text shows data that contradicts the predicted pattern	
Finn	
Researcher: So like working as a team? Finn: Yeah it's part of Forest School like in the woods or Scouts stick together. Like it's just like a natural instinct. Just like you'd feel like you're getting more done if you're with a group and like you would be getting more done. (Lines 173 – 176)	N/A

Robyn	
Researcher: And then you mentioned also that you get to do it [shelter building] with your friends? Robyn: Yeah, it was really fun. It's good to work together with your friends. Like you can have a few laughs with it as well. Like I was laughing my head off when I got soaked. (Lines 101 – 103)	N/A

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link opportunities to develop relationships with peers and leaders through play or working together with a sense of engagement and/or enjoyment or the opposite Pattern-matching codes applied: 'relationships through play' 'relationships through teamwork' 'engagement/ and or enjoyment' Underlined text shows data that contradicts the predicted pattern
James (Class Teacher)
Would you have seen opportunities for the children to develop relationships with others in the group? Am, to an extent, yes. I think a big influence on that is the groupings I put them in. Um, so like straight away that's going to affect whatever happens inside there. Um, so it's not hermetically sealed in that sense. I've already done something that's going to impact that a lot. Um, so did I notice anything that stood out in that regard? Um, I thought they built up a good relationship in general with Eve and Jack. Um, I thought they were able to relate to them very well. (Lines 183 – 189)
Eleanor (Parent)
She's enjoying it and she's enjoying doing those tasks and she's enjoying being in nature and she's enjoying working cooperatively with her friends. (Lines 125 – 127)
Beth (Parent)
Would there be any benefits that you've seen to them having Forest School? I think it was a nice way for the children to interact with each other. Playing and working as a team, you know. Like I know I keep going back to the building the fort, but she very much loved doing that. (Lines 105 – 107)

Part 4: Thematic Analysis

Theme	Subtheme(s)	Key Quotes
Building Relationships	Relationships with others Different perspectives Facilitating social connections	*James, the class teacher, emphasised the planning that he put into splitting the class into two groups, to ensure everyone would be with someone they got on with:* I had to be very precise about how I went about it and in general, I was making sure that everyone had someone they automatically got on with. [*Okay*] I didn't want anyone to be isolated in that sense where they were in a separate group to all their friends. *This influenced his response to the question about the children having opportunities to develop relationships, and is an interesting consideration:* Um, to an extent, yes. I think a big influence on that is the groupings I put them in. Um, so like straight away that's going to affect whatever happens inside there. Um, so it's not hermetically sealed in that sense. I've already done something that's going to impact that a lot. *Beth, one of the parents, commented on how Forest School gave her daughter and her peers opportunities to engage with each other that didn't involve technology:* Exactly. And like the water pouring over her head and things like that. That's fun. Do you know it was, it made her laugh. It made her friends laugh, you know, they were having a good jolly fun time together that wasn't them texting each other on WhatsApp. *Beth continued:* They do Facetime, they do WhatsApp, all these kinds of things. So this was a really good opportunity for them to just hang out together. And allows them to speak to each other person to person. *When asked about the leader's role Robyn spoke about 'help':*

		They like help you out if you're stuck and like if you're doing something wrong then they will give you like help. *Robyn spoke about how Jack helped them to find materials that enabled them to experience better success with fire:* Say if you got like a bad branch for your fire, then Jack would help you find where to find a good place to find the right branches for the fire. Like dry leaves or twigs. *James, the class teacher, observed the relationship that was built with the leaders:* Um, I thought they built up a good relationship in general with Eve and Jack. Um, I thought they were able to relate to them very well. *James commented on his observations of how the sessions were facilitated:* And I think Jack and Eve were doing a lot of observing and just seeing what was grabbing their attention and kind of, not directing them, but just picking up on these opportunities to improvise a little. So I thought that was good. Yeah. *Eleanor, a parent. also described how the facilitation of the sessions impacted on her daughter's experience:* But then anyway, even apart from that she, you know, she's also a child whose very quiet in herself, very reserved. So it's, you know if she had gone to something that wasn't facilitated very well, then she might not necessarily enjoy it. But anyway, whatever happened, am, on the days, I know that she really enjoyed it. *Finn commented on opportunities to engage in teamwork at Forest School. Finn elaborated on this association from his perspective:* [And is there anything during the sessions that you feel you managed to do with the group that you wouldn't have managed on your own?] Well like going back to the shelters that happened with like two other people. That would have happened way slower if it was

		just me by myself. And probably it wouldn't have been done that well cause like different point of views can see 'Oh there's a hole there. Oh, it's leaking. [Okay. So there are different people with different perspectives working together?] Finn: And different ideas. *Robyn gave some examples of working together to build the shelter:* a tepee type thing that we made I mean like we split up into three groups and then we all did our own version So like my friends' group made Like maybe working on it with your friends is fun Am like you just work with your friends and it's nice to just work together with your friends sometimes too. *Although James commented that he had planned the overall group, within that group he noticed some examples of teamwork that he hadn't anticipated:* Yes. And uh, I saw, you know, I got to see them working in maybe bigger groups than usual. Some of them were working with people that wouldn't usually work with and they were getting on really well. *Eleanor, a parent, also commented on teamwork:* But I get the sense from her that it was working cooperatively with people <u>Different Perspectives</u> Forest School provided opportunities for children and adult to see others from different perspectives. *James commented on the different perspective the different groups and environment gave:* Ah, well the makeup of the groups, it was interesting in the different

		environment, it's a totally different perspective on them. Some of them behave in ways that I didn't expect in the different environment. *He expanded on the impact that the group dynamics might have played:* Ah, part of it could be down to the fact that, ah, the group dynamics for certain friends might be different when it's just two of the friends say as opposed to the four being together as they might be in a classroom scenario. *James described how some of the children's motivation to engage in Forest School surprised him:* Some of them, I might have imagined that they would choose video games over being out in the woods any day of the week but that was not an issue at all. Yeah, I noticed similar this time around now, that there were no complaints about getting bored and things like that. *And gave him the opportunity to learn more about children in his class:* I wasn't aware of any interests he had in anything like this *Eleanor commented on how the children also had the opportunity to see new sides of each other:* And I suppose you'll also, they'll see their classmates in a different way maybe, you know, working cooperatively together and just things that people have strengths in certain areas maybe that they wouldn't have in the classroom. You know, it's sort of seeing a different side of them as well. *Explaining that her daughter had dyslexia, which sometimes meant she struggled with literacy activities in the classroom, this change of perspective in peer relationships was important to Eleanor:* You know, then when she gets the opportunity to do that and her classmates see her in that role as being quite competent you know that's really good for

		her self-esteem because she, you know, she's doing something she likes
Views and Experiences of Forest School	Engagement in FS	*James was surprised that the majority of the group (sixth class) engaged with the group games;* When they were doing the games at the beginning, I was pleasantly surprised by not, it's not all of them, and again some of it is down to age and the stage they are at. Uh, but the vast majority of them really embraced the games and the games, some of those games are games you could play with first and second classes, some very innocent games. Um, so I was surprised how you know, given what they're used to these days, I presume, with you know, social media and all that and being too cool for school. That didn't impact on the way they reacted to the games.

Part 5: Summary of Proposition 3 Findings in Case 2

The data related to Proposition 3 in Case 2 were analysed in accordance with the criteria outlined in Part 1 of this section. Analysis of the perceived relatedness subscale of the Basic Need Satisfaction in Forest School scale showed that participants perceived relatedness was positively correlated with intrinsic motivation. This is interpreted as an association between feelings of relatedness and engagement and enjoyment in Forest School. This reflected the findings from these scales in Case 1.

Pattern matching logic applied to the child conversations and interview responses linked activities that involved teamwork and play with opportunities to develop relationships in Forest School. Robyn described how "getting to work together with your friends" building shelters was "really fun" (Part 3.1). This illustrates an activity the facilitated a sense of perceived competence and relatedness For Finn, teamwork was likened to a "natural instinct". By working with others to build the shelter he felt "you would be getting more done" (Part 3.1). The children's motivation was evident through their creativity and engagement with the building activity. Importantly, James, the class teacher in Case 2, commented that he had intentionally split the group a particular way. It must be considered that this may have facilitated the

teamwork observed by the children and parents, including Beth and Eleanor when the described their children “working cooperatively with her friends” and “playing and working as a team” (Part 3.2). Although not discussed by the teachers in Case 1, the class were also divided into groups. This may have impacted on the opportunities to develop relationships in Case 1 also. James did observe that the children “built up a good relationship” with the leaders which was something he could not have controlled for.

Themes and subthemes connected with relatedness reflected participants interview responses about opportunities to develop relationships with others and to see others in a different context. Working with their peers was important to both children interviewed. Robyn described how “it was nice to work together” while Finn suggested that his shelter “wouldn’t have been done that well” if he worked alone, as “different point of views can see “Oh there’s a hole there. Oh, it’s leaking.” (Part 4). For one of the parents, Beth, Forest School was an opportunity for the children “to speak to each other person to person”, a social skill diminished through increased access to “technology” (Part 4). James, the class teacher, was in a position to observe his class during sessions. He spoke about how the different environment gave him “a totally different perspective” on some of the children. Children whom he “might have imagined … would choose video games over being out in the woods any day of the week” surprised him with “no complaints about getting bored”. This suggests that the children were motivated to engage in tasks and activities. Eleanor felt the children might “see their classmates in a different way”, with “strengths in certain areas maybe that they wouldn't have in the classroom” coming to the fore when working together in a different context. Eleanor described how her daughter has a specific literacy difficulty and thus experienced challenges with certain classroom tasks. As well as the opportunity to excel at tasks at Forest School, which increased perceived competence, when “her classmates see her in that role” Eleanor felt “that’s really good for her self-esteem” (Part 4).

Appendix DD Case 1 Analysis of Proposition 4

Proposition 4 hypothesises that there will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 4 for Case 1.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 4. Part 2 reports the participants' mean score on the Connection to Nature Index, interpreted as children's relationship with nature. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 4, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 4.

Part 1: Criteria for Interpreting Proposition 4

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School	The mean score on the Connection to Nature Index will be above 4, with all participants scoring above 3.00, indicating children's connection to nature in line with previous research conducted with children (Bragg, Wood, Barton, & Pretty, 2013)	Pattern-matching: Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment	Pattern-matching: Interview responses that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment

Part 2: Scale Data

The Connection to Nature Index (Cheng & Monroe, 2012) gives a value of between 1 and 5 for connection to nature. Participants were categorised as 'not connected' (scored 3 and below) and 'connected' (scored above 3) in line with previous research conducted with children (Bragg et al., 2013).

Mean connection to nature scores for this measure and proportions of participants in each category are reported in the Table DD1 below.

Table DD1

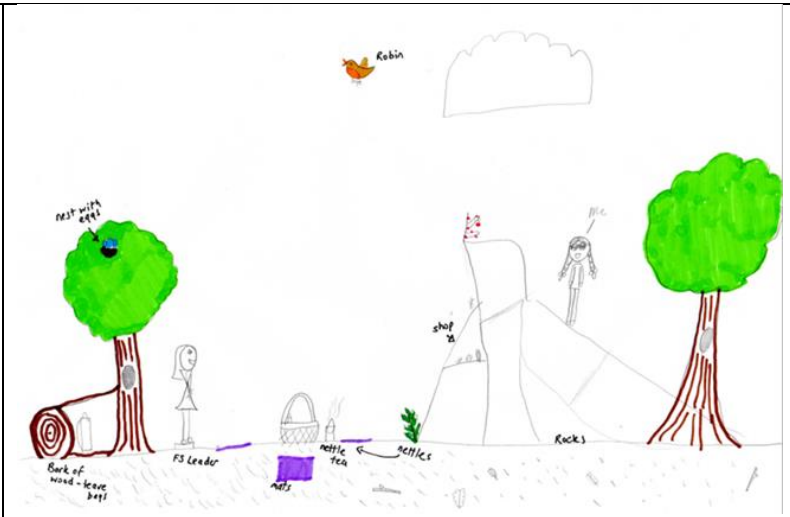
Connection to Nature Index Scores Case 1

	Proportion of Participants	**Mean score**	**Standard Deviation**	**Range**
Connected to Nature	100%	4.35	±.43	3.44 - 5
Not Connected to Nature	0	n/a	n/a	n/a

The total Connection to Nature scores for children in Case 1 ranged from 3.44 to 5, with all 16 participants falling into the 'connected' category. The mean score was 4.35 ±.43, indicating children reported a high level of connection to nature.

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

Pattern Matching Criteria	
Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with an opportunity to connect with nature, or the opposite Pattern-matching codes applied: 'outdoor environment' 'connection with nature' (enjoyment of nature / empathy for creatures / sense of oneness / sense of responsibility) Underlined text shows data that contradicts the predicted pattern	
Kate	
Describing elements of Forest School in her picture that are important to her; [Wild Tea] the like the tea is warming up and I put a nettle there to give a clue that it will be nettle tea [Mats] So we don't get our pants all dirty cause there might be dog poo under where we sit [Birds Nest] It's a nest with some eggs in it…*So we've got a nest with eggs*…Robin eggs [Comparing Forest School to the classroom] I think for me FS is a bit more interesting *And what makes it more interesting?*	

Because I get to be like I get to like spread out and like do what I want with nature and I also like being in the fresh air and I really like being in the forest	
Sadie	
I noticed that you put lots of trees in the background – is that an important part of Forest School? Yes, it wouldn't be a Forest School if there were no trees. *Why do you think is happens somewhere that there are trees?* Because…we need to get outdoors.	

Part 3.2: Pattern Matching Applies to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with an opportunity to connect with nature, or the opposite Pattern-matching codes applied: 'outdoor environment' 'connection with nature' (enjoyment of nature / empathy for creatures / sense of oneness / sense of responsibility) Underlined text shows data that contradicts the predicted pattern
Lucy (Class Teacher)
Do you see the children having opportunities to develop relationships with the natural world? Yeah, they really click with nature. There is just something about it that you know the English, Irish and Maths, you know you see them doing it and you kind of wonder god they don't seem very interested. And then the minute you bring them out it's like a lightbulb goes off. (Lines 107 – 111)
Tom (Special Education Teacher)
What do you see as the opportunities for learning at Forest School? I think one of the things it does is it just gives the children access to the outdoors… then for those children who ah might have challenges with literacy or maths or things like that they tend to really shine in the outdoors because it is something that am that is kind of not as academically focused (Lines 24 – 32) *Do you see the children having opportunities to develop relationships with the natural world?* and what you find with Forest School you have children who would have been very indoorsy coming and saying you know I brought my mum or I brought my dad up to the forest. And you know we showed them base camp, we did. We showed them where our base was and gave them an example of what we were doing and I think that is a very positive outcome because am it's, it's bringing the fun out of the outdoors and really teaching children that you know engaging in outdoor learning is a very positive thing getting out and about in the fresh air and just having nature as your surrounding (Lines 171 – 179)
Anna (Parent)
Forest School is a set or scheduled time to be outdoors each week. As a parent how do you feel about that? so yeah absolutely anything that has them outdoors and has their, again it's kind of back to fostering a growth mindset, that they don't see it as a negative that's it's cold and it's wet its just 'yay we are going to the forest' (Lines 268-272)

Rosie (Parent)
Are there any benefits that you, as a parent, would see to them doing Forest School? or just that interest you know just like just I guess when you're there it can be just so inspiring like the conversations that come out of being in the natural environment (Lines 173 – 175) *How did your child, or the children you observed, feel about Forest School do you think?* My particular children loved it because it reflected their own interests at home. Now not every child was the same and some children did find it tricky at the beginning. Some children … you know, who felt that had to be clean all the time. … where they, you know, were really afraid of, you know, stepping in something or something landed on them or you know, they were bordering on hysterical … (Lines 264 – 271) but by the end of the block, there was huge improvements (Lines 293 – 294)

Part 4: Thematic Analysis

Theme	**Subtheme(s)**	**Key Quotes**
Being Outdoors	Connecting with Nature Knowledge of Nature Affordance of Nature	*Kate commented on how the Forest School leader taught them about nature:* Um I think she [Emmy] like helps us to learn from Forest School like she taught us that magpies are actually the best at making nests [Researcher: Oh so you learn things about the birds?] Kate: And about nature *When asked what she was doing in her picture, Kate responded:* I'm just um like wondering what type of berries they are and wondering if maybe the robin would eat them…So I was wondering if I stay really still in the picture like in the picture the robin would come and pick one. *Kate commented on opportunities to get close to robins:* So far robins have been coming really close to me…well maybe this far away…Like I stay really still and they don't even know I'm there. *Sadie commented on ways they can use natural materials:* If we want, we can build a little thing out of sticks.

		Describing the opportunities for learning in Forest School Lucy stated: You see the kids who really, really love nature and really feel connected and who just love being out. *Tom spoke about activities that incorporate elements of nature:* ah, for example, I am just even thinking of last week when we did land art based on you know on different bugs and different creatures *Tom referred to sit-spots [finding a quiet space to take time to notice their surroundings]*: spending time noticing things in the sit spots at the end as well. *Anna, a parent, felt Forest School gave:* an alternative way of learning am and bringing them closer to nature and giving them a revised or sort of refreshed appreciation for it and all the sort of different learning modules that they get through that medium. *Anna commented on the children's increased knowledge about their local area:* And it helps I think it helps us to be better parents as well insofar as the children are teaching us about where we live and they are delighting in the fact that they are equipped with knowledge and are informed with respect to what's on our doorstep. *Anna also described what she saw as the multi-sensory benefit:* And I think, as well, you know I feel it's a multi-sensory benefit because even with the simple things like I think the taste of your lunch tastes different when you're eating it outdoors, the smells that are in the forest, the sounds of the birds and the different birdsongs

		Rosie commented on the time outdoors that Forest School gave the children: Just to make use of it for such a long period of time like to be out there for two and a half hours this block it's fantastic. You know when do the children get that long outside to notice all of these things and when often their days are so taken up with technology and things. *Rosie commented on the sit-spots [finding a quiet space to take time to notice their surroundings]:* I think after having all that movement you know for the previous two hours and then you know just that they're learning so much about the place and they feel part of it and then just to have that few minutes at the end that they can just quietly take it in *Describing the benefits of Forest School Rosie stated:* It's just to get to be outdoors and to get to appreciate something different, something new. You know it's not learning the plant names or things like that that are particularly important.
View and Experiences of Forest School	Barriers to Participation	*When asked if there is did not like about Forest School Kate commented:* I don't really like if sometimes I can smell a bit of dog poo and I don't like the smell of it *Sadie referred to dogs as a challenge:* Am they have to be careful cause dogs want to eat their lunch. *Anna commented on appropriate clothing as a challenge associated with learning outdoors:* The only challenge and it's a parent challenge when we shouldn't probably, and most people maybe won't admit it, is just the outdoor clothing and having them ready and geared up for it, that's the only comment really.

Part 5: Summary of Proposition 4 Findings in Case 1

The data related to Proposition 4 in Case 1 were analysed in accordance with the criteria outlined in Part 1. The Connection to Nature index was used as a measure of the children's nature connectedness. Previous research with children engaged in nature-based activities reported scores above 4. Children's mean score, in Case 1, was 4.35, interpreted as connected to nature. Pattern matching logic applied to the child conversations and interview responses linked access to the woodland environment, including trees and wildlife, with opportunities to develop a relationship with nature. For example, pattern-matching logic applied to Sadie's comment about looking forward to going back to Forest School in Second class linked her positive "yeah" to her enjoying "the trees". Lucy described a child who "has totally come out of himself" in the "forest" environment. Pattern-matching logic applied to Lucy's response linked children who "love" and "feel connected" to nature with enjoying "being outdoors". Pattern-matching logic applied to Tom's linked the children's previous experience of Forest School with "a really positive relationship with the outdoors and with the environment around them". Sadie associated the "smell of the trees" with "fun" in Forest School. Anna was asked how, as a parent, she felt about the children being outdoors. Pattern-matching logic applied to her response linked "fostering a growth mindset" with "going to the forest".

Themes and sub-themes related to this proposition indicate that the participants associated access to the woodland environment with interest and enjoyment. However, the environment was also associated with challenges. Both children and parents referred to the children's increased knowledge of the environment. Kate associated the role of the Forest School leader with helping them "to learn from Forest School". Anna saw Forest School as "bringing them (children) closer to nature and giving them a revised or sort of refreshed appreciation for it". As Rosie alluded to, connecting with nature was not synonymous with knowing about nature. The children had opportunities to be active in the environment, to engage with it in the way children naturally do, through play, and then to take time to notice nature too. Anna described it as a "multi-sensory" experience for the children.

The children's relationship with nature included affective, cognitive, and behavioural aspects. Kate described her sense of closeness to nature, "So far robins have been coming really close to me…well maybe this far away…Like I stay really still and

they don't even know I'm there" (Section 4). Anna, a parent, recognised how her children's knowledge of nature had developed, "teaching us about where we live" and how they were "delighting in the fact that they are equipped with knowledge and are informed with respect to what's on our doorstep" (Section 4). Tom, the SET, described the behavioural change he noticed in some children as "children who would have been very indoorsy" brought their parents back to the Forest School site outside of Forest School time (Section 4).

Being outdoors was also associated with its challenges, which may have presented as barriers to engagement and enjoyment of nature for some children. Kate spoke about "dog poo" while Sadie mentioned "dogs" when asked what they didn't like about Forest School. Similar to Anna spoke about her overcoming a fear of dogs in relation developing competence, it is worth considering that an environment with animals may be fear-evoking for some children and may make Forest School an unpleasant experience. From a parent's perspective, Anna spoke about the challenge of having children dressed for the outdoors. In this vein, it should be considered that children who were more comfortable outdoors may have reported more positive feeling towards nature.

Appendix EE Case 2 Analysis of Proposition 4

Proposition 4 hypothesises that there will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School. The following section provides a comprehensive analysis of findings related to Proposition 4 for Case 2.

Part 1 provides an overview of the criteria for the interpretation of findings related to Proposition 4. Part 2 reports the participant's mean score on the Connection to Nature Index, interpreted as children's relationship with nature. Part 3 outlines the application of pattern matching technique. Part 3.1 documents pattern matching applied to the child conversations and drawings, where applicable. Part 3.2 documents pattern matching applied to other participants interview transcripts. In Part 4 there is an overview of themes and subthemes related to Proposition 4, exemplified in key quotes from participants. Part 5 provides a summary of findings related to Proposition 4.

Part 1: Criteria for Interpreting Proposition 4

Proposition	**Scale Data**	**Child Conversations**	**Semi-Structure Interviews**
There will be variability in the extent that children will associate access to the woodland environment, including trees and wildlife, with an opportunity to connect with nature at Forest School	The mean score on the Connection to Nature Index will be above 4, with all participants scoring above 3.00, indicating children's connection to nature in line with previous research conducted with children (Bragg, Wood, Barton, & Pretty, 2013)	Pattern-matching: Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment	Pattern-matching: Interview responses that link access to the Forest School environment, including references to trees and wildlife, with a connection with nature, or the opposite Thematic analysis: Themes within the data set that refer to natural aspects of the Forest School environment

Part 2: Scale Data

The Connection to Nature Index (Cheng & Monroe, 2012) gives a value of between 1 and 5 for connection to nature. Participants were categorised as 'not connected' (scored 3 and below) and 'connected' (scored above 3) in line with previous research conducted with children (Bragg et al., 2013). Mean connection to nature scores for this measure and proportions of participants in each category are reported in the table below.

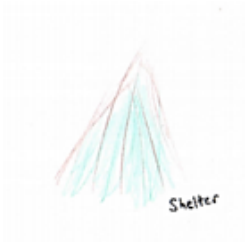
	Mean score	**Standard Deviation**	**Range**
Connection to Nature	4.26	±.55	2.81 – 4.88
18/19 Participants score > 3 = 94% Connected to Nature			

The total Connection to Nature scores for children in Case 2 ranged from 2.81 to 4.88, with all 18 out of the 19 participants falling into the 'connected' category. The mean score was 4.26 ±.55, indicating most children reported a high level of connection to nature. The other participant's score was 2.81.

Part 3: Pattern Matching

Part 3.1: Pattern Matching Applied to Child Conversations

<table>
<tr><td colspan="2">Pattern Matching Criteria</td></tr>
<tr><td colspan="2">Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with an opportunity to connect with nature, or the opposite
Pattern-matching codes applied:
‘outdoor environment’

‘connection with nature’ (enjoyment of nature/empathy for creatures/sense of oneness/sense of responsibility)</td></tr>
<tr><td colspan="2">Finn</td></tr>
<tr><td>And how do you feel then about learning outdoors?
Finn: Oh we do learn some really cool stuff cause like, am, last week we did like the thing where you had to make shelter to keep out the water. And to think like it'd be useful like if you like know how to do these. Kind of like if you go camping.</td><td>  </td></tr>
<tr><td colspan="2">Robyn</td></tr>
<tr><td>Researcher: Do you think that Forest School is different to learning in the classroom?
Robyn: Oh definitely. You don't get to do all the creative things like making a tepee and stuff in the class because there is not enough room obviously and it's like kind of nice to have fresh air while you're learning.</td><td></td></tr>
</table>

Part 3.2: Pattern Matching Applied to Semi-Structured Interviews

Pattern Matching Criteria
Interview responses or elements of drawings that link access to the Forest School environment, including references to trees and wildlife, with an opportunity to connect with nature, or the opposite Pattern-matching codes applied: 'outdoor environment' 'connection with nature' (enjoyment of nature/empathy for creatures/sense of oneness/sense of responsibility)
James (Class Teacher)
Describing the balance between outdoors and technology that Forest School has created in their school; They have this fantastic opportunity. So it provides a wonderful for balance in that sense where technology is becoming a bigger part of school, but they're not losing that connection with the natural world, so to speak. (Lines 260 – 263)
Eleanor (Parent)
And I'm sure it's beneficial to all children but particularly if you have, so some children just seem to really benefit from being in nature and they seem very comfortable. So I think I have one of those children and, something like Forest School is to me is meeting their needs. (Lines 202 – 203)
Beth (Parent)
And I think having that couple of hours out in the fresh air, it's, it's nearly a sort of meditation or you know, just getting out into the fresh air, deep breath, open space. (Lines 165 – 168)

Part 4: Thematic Analysis

Theme	Subtheme(s)	Key Quotes
Being Outdoors	Connecting with Nature Knowledge of Nature Affordance of Nature	*When asked about opportunities for learning outdoors James commented:* I thought it was great that we were right in the heart of the city and yet, we could have been much further out. Now for the children themselves, I don't know if they found it that way. Did some of them, were some of them still very much aware that I'm still slap bang in the city and did that kind of take away from it a little, the sense of being out in nature as such. Um, but from my perspective, and given everything they were doing, none of it would take you out of that bubble, so to speak. *He spoke about the activities the children were doing were largely nature-based:* Am, yeah. I, I got a sense that everything they were doing was very much, um, in the moment, in the zone of being in nature. I didn't think there was anything that happened that took them out of that experience. *James continued by describing the balance he feels Forest School offers between access to technology and connection with nature:* Our principal was saying how, you know, some parents were a bit concerned about how much technology is being used in schools and imagining them over screens all day and all this, and these are exaggerated concerns from my perspective, but she was able to balance that and say, look, we are embracing technology, but on the other hand, they have this fantastic opportunity. So it provides a wonderful for balance in that sense where technology is becoming a bigger part of school, but they're not losing that connection with the natural world, so to speak.

		Yeah. Because I'd be hard pressed to think of an activity that would balance it out so well. *Eleanor, one of the parents, commented on her daughters existing connection to nature:* Yeah. She has that bit of pull, you know, towards nature. *When asked about having regular opportunities for learning outdoors, Eleanor expressed her support:* Yeah. Oh I mean, I would be really in favour of that Yes - Yeah, no, I mean I'd be completely in favour and I would really wish that there were more opportunities for them to be outside as part of the, am, the school day. I mean, I think, you know, like everybody just benefits from being outdoors and children, particularly. *Eleanor linked access to the outdoors with wellbeing:* I can see the huge difference in their mood from nothing not having any fresh air or exercise today. So yeah, I do think, am, the opportunity, you know, to do something like Forest School in school time, it's fantastic because it kind of validates that as a form of learning and also just for primary school children in terms of their mental health and their wellbeing and everything. *Eleanor continued:* Am, I mean so many children now have anxiety and am, related issues about really, you know, nature and being in nature I think really helps people to cope, to cope with anxiety and to cope with the stress. *Like James, Beth contrasted access to the outdoors with technology:* And I think having that couple of hours out in the fresh air, it's, it's nearly a sort of meditation or you

		know, just getting out into the fresh air, deep breath, open space. Doing something that's just not as pressurised as technology is, you know, I don't know. *Beth also linked time in nature with mindfulness for the children:* Yeah like I'm a big fan myself of mindfulness, so that's probably where I'm kind of going with it. Whether it's just, you know, having that two hours where you're just out and doing something that's just completely different and am just not pressurised and just having fun and getting a bit dirty. <u>Enjoyment of Nature</u> *Robyn associated the fresh air with enjoyment outdoors:* and it's like kind of nice to have fresh air while you're learning. *Eleanor commented on how her daughter enjoys nature so learning outdoors suited her:* Now she is a child who loves nature anyway, and she does love to be like she does orienteering and hiking and scouting and all that are amongst her favourite things to do.
View and Experiences of Forest School	Barriers to participation Engagement in FS	*Eleanor mentioned the importance of appropriate footwear;* I think the first week we weren't very prepared and she just had runners but anyway then we kind of learned from that and she wore something more sturdy the next day. The challenge is to dress appropriately and be aware of the weather conditions and all the rest of it. *Robyn expressed that some of her peers were squeamish about elements of nature;* You kind of get mucky but you can get over that cause it's like a lot of fun. Some of your friends are really squeamish and they're still like, oh my gosh it's a slug. And you're just like, why are you so scared of a slug?

		James expressed that he was surprised how engaged some of the children were in the woodland environment: Am, giving them that feedback that the last group, you know, they were very engaged and that class were, there were a lot of children with complicated needs and they surprised me in only positive ways and how well it suited them. Because you know, it might not be for everyone. Some of them, I might have imagined that they would choose video games over being out in the woods any day of the week but that was not an issue at all. Yeah, I noticed similar this time around now, that there were no complaints about getting bored and things like that. *James recognised how the children appeared to be present while at FS*: I didn't, I didn't notice them chatting about things that were unrelated to what we were doing. They didn't, I didn't hear them talk to you about plans for the weekend or anything like that or what they were going to be doing after school and stuff like that. They did seem to be very absorbed and were engaged in what they were doing. *Beth likened it to mindfulness*: Yeah like I'm a big fan myself of mindfulness, so that's probably where I'm kind of going with it. Whether it's just, you know, having that two hours where you're just out and doing something that's just completely different and am just not pressurised and just having fun and getting a bit dirty.

Part 5: Summary of Proposition 1 Findings in Case 2

The data related to Proposition 4 in Case 2 were analysed in accordance with the criteria outlined in Part 1. The Connection to Nature index was used as a measure of the children's nature connectedness. Previous research with children engaged in nature-based activities reported scores above 4. Children's mean score, in Case 2, was 4.26. Eighteen out of nineteen children score above 4, interpreted as "connected to nature". However, one child's score was 2.81 which fell below the threshold of "connected to nature". This reflects the variability in nature connectedness hypothesised.

Pattern matching logic applied to the child conversations and interview responses linked access to the woodland environment, including trees and wildlife, with opportunities to develop a relationship with nature. When asked about learning outdoors Finn spoke about the opportunity to work with natural materials to "make a shelter" and Robyn referred to "creative things". This may suggest that their experience of FS was influenced to a greater extent by the tasks and activities as opposed to the natural environment. Robyn did continue to express how it was "kind of nice" to have "fresh air" outdoors. The children's responses, combined with the slightly lower mean connection to nature score on the CNI, suggest that a connection with nature was not developed to the same extent in Case 2 as in Case 1.

Patterns in the teacher and parents' responses drew connections between time spent in the outdoor environment and an opportunity to connect with nature. Beth felt the "couple of hours out in the fresh air" was akin to "meditation", or a sense of oneness with the natural world. Eleanor reflected the variability in children's nature connectedness when she suggested that "some children" seem "to really benefit from being in nature" and "they seem very comfortable". For James, the teacher, the opportunity to develop a "connection with the natural world" balanced against the increased emphasis on technology in the children's lives.

Themes and sub-themes related to this proposition indicate that the participants associated access to the woodland environment with interest and enjoyment. The time at Forest School was associated with time to be present in nature, with James stating in his interview that he "didn't think there was anything that happened that took them out of that experience". However, he wondered if the children "found it that way" or if they were aware they were still "right in the heart of the city". Eleanor commented that her daughter "has that bit of pull… towards nature". Nature connectedness may be

associated with family value, including previous experiences in nature. She made the link between time outdoors and “mental health and their wellbeing”, suggesting that “being in nature I think really helps people to cope, to cope with anxiety and to cope with the stress”.