Honoring Children's Agency:
A Systematic Review of Research *With* and *By* Children in Environmental Contexts

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ABSTRACT

As climate impacts increase, research that meaningfully engages young children as agents of change could contribute to children's confidence, sense of belonging, and agency. Further, research *with* and *by* young children has been identified as an emerging trend in the field of Environmental Education Research (Green, 2015). This systematic literature review explores the theoretical and methodological approaches utilized in research conducted with and by young children in environmental contexts and seeks to contribute to a broader conversation that will equip researchers and early childhood educators to engage in effective and impactful participatory action research with young children. It appears that it is not the specific theoretical or methodological approach that ensures research *by* children, but the child's active involvement in the project before and beyond the data collection phase which requires the researcher's active reflexivity and willingness to release control and power over the research process.

Keywords: early childhood, environmental education, education for sustainability, participatory research, child-led research

Young children will not only inherit the climate crisis, they are experiencing its impacts now (Helldén et al., 2021). The impacts of the climate crisis, including physical and psychological effects on young children, are well documented (Burke et al., 2018; Sheffield & Landrigan, 2011). While children are often positioned as most vulnerable in the context of the climate crisis, the Early Childhood Education for Sustainability (ECEfS) literature positions children as *current* agents of change "possessing the ability to make their own choices and affect change" (Dean & Elliot, 2022, p. 63), rather than *future* environmental stewards. This systematic literature review simultaneously acknowledges the impacts of the climate crisis on children while affirming their right to speak and act for themselves, in society, and in research.

Further, conducting research *with* and *by*, rather than on, children has been proposed as a promising paradigm in Environmental Education Research by Barratt Hacking et al. (2013) in their seminal chapter *Children as Active Researchers* and documented as an emerging trend in Environmental Education (EE) by Green (2015). Green (2015) argues that "the way in which EE researchers approach research with young children is key... in promoting children's active participation as agents of change" (Green, 2015, p. 208). Therefore, I assert that as a field, there ought to be a direct connection between our affirmation of children's agency and engaging children in the research and knowledge co-creation processes.

The purpose of this systematic literature review is to explore the theoretical and methodological approaches utilized in research conducted with and by young children in environmental contexts, in particular, the role of both child and researcher, in the hopes of informing ongoing professional research practices that affirms children's agency and positions children as agents of change. As climate impacts increase, research that meaningfully engages young

children as agents of change could contribute to children's confidence, sense of belonging, and agency. This systematic literature review seeks to contribute to a broader conversation that will equip researchers and early childhood educators to engage in effective and impactful participatory action research *with* and *by* young children. Therefore, the research questions guiding this literature review are as follows:

1. What theoretical and methodological approaches are being used in environmental contexts to conduct research *with* and *by*, rather than *on*, young children?
   a. What role(s) do the children and researchers play in the research process?
2. What challenges have been identified by researchers working in environmental contexts to conducting research *with* and *by* young children?

Method

This systematic literature review was guided by the Galvan and Galvan (2017) method for conducting literature reviews. This review is comprised of an 8-year period, from 2015-2023, building on a literature review conducted by Green (2015) that explored literature from 2004-2014, the United Nation's Decade of Education for Sustainable Development. Inclusion was limited to empirical articles that had undergone double-blind peer review to ensure the articles met professional and ethical standards. Further, research conducted with young children aged birth to ten was included to focus on early childhood. Finally, the Environmental Education (EE) field is broad and evolving; therefore, research from EE, Early Childhood Education for Sustainability (ECEfS), and other research conducted in environmental contexts concerning climate change impacts or involving nature-based learning will be included. These inclusion criteria are expressed in the form of questions in Table 1.

Table 1
Inclusion Criteria Identification Questions

Inclusion Criteria Questions:
Was this study published between 2015 – 2023?
Did this study undergo a double-blind peer review?
Is the content or context of this study relevant to EE, ECEfS, climate change education, or nature-based learning?
Does the study involve children in the research process? That is, is this research conducted *by* or *with* children (as opposed to *on* children)?
Are the children involved in the study ages birth to 10 years old?

Data Collection

An initial search was conducted using Education Research Complete, which was chosen as it is an educational database focusing on a range of ages and educational topics, in the hopes of generating the broadest range of possible results to apply the inclusion criteria. Searches in Education Research Complete were conducted using keywords to address the major topic of the review: children as researchers in environmental contexts. These keywords included: "participatory action research or community-based participatory research," "young children or early childhood or preschool or kindergarten or early years," "environment or sustainability or climate change or natural resources or environmental protection," "children as researchers," "children as active researchers," "child-led research," "environmental education or outdoor education or conservation education." Additionally, filters limited the search to include only peer-reviewed articles published between 2015 and 2023. These searches resulted in 121 articles, of which nine met the inclusion criteria. Additionally, reference lists were reviewed to identify other relevant articles for inclusion, resulting in an additional two sources for inclusion.

Data Analysis

Analysis began by creating a data extraction matrix that included categories that record basic information about each article and categories that correspond to the research questions, as recommended by Galvan and Galvan (2017). A summary of the data extraction matrix can be found in Appendix A. The relevance of these categories to the inclusion criteria and research questions is outlined in Table 2.

Table 2
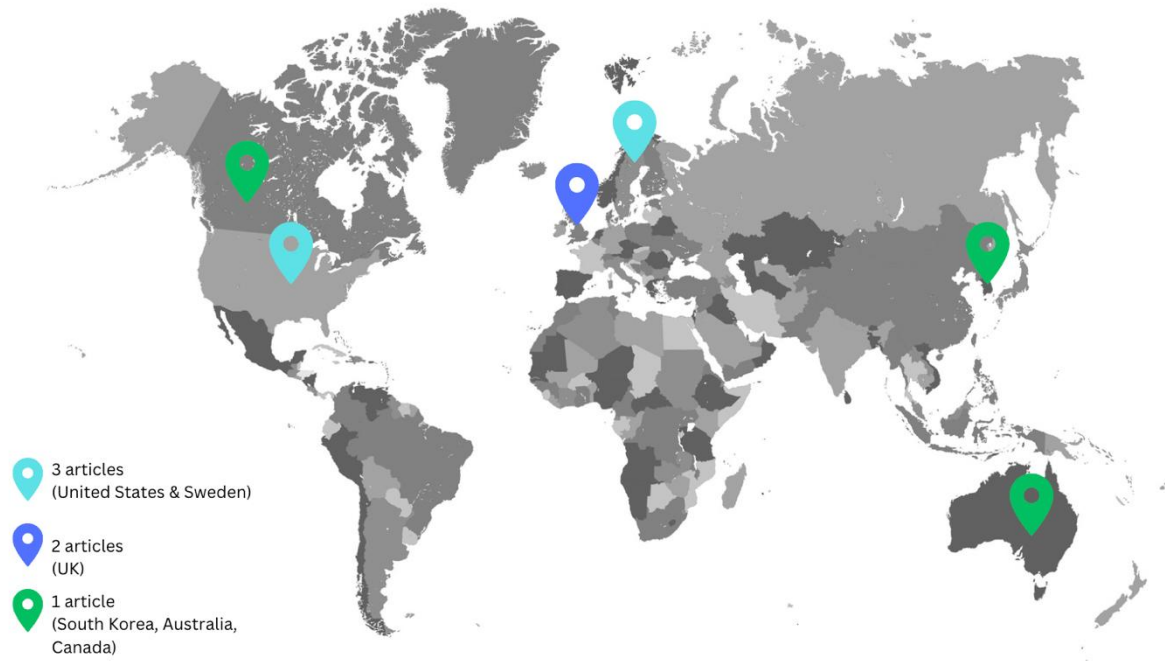*Matrix Category Relevance to Inclusion Criteria and Research Questions*

Category	Inclusion Criteria Relevance	Relevance to RQ
Field	Environmental contexts including EE, ECEfS, climate change, and nature-based learning.	R1
Age of children	Ages birth to 10 years old.	R1
Theoretical Foundation	Participatory research with or by children	R1
Methodology	Participatory research with or by children	R2 / R3
Data Collection & Analysis	Participatory research with or by children	
Ethical & Other Considerations Working with Children	Participatory research with or by children	R2 / R3
Role of Child	Participatory research with or by children	R2 / R3
Role of Researcher	Participatory research with or by children	R2
Challenges	Participatory research with or by children	R3
Recommendations	Participatory research with or by children	

After confirming articles met the inclusion criteria, each article was reviewed in its entirety and data related to the categories (see Table 2) was extracted. A comparative approach was used to analyze the data across each category of the extraction matrix to identify key themes, similarities, and differences across the included articles. Findings are organized to answer the research questions addressing theoretical foundations, methodological approaches, role of the child, role of the researcher, and challenges. Considering these findings, recommendations are made in the hopes of furthering effective and impactful participatory action research with and by young children.

Results

Eleven articles were included in the final analysis. Articles were equally split between publication in journals specific to Environmental Education (such as the *International Journal of Early Childhood Environmental Education*, *Environmental Education Research*, and the *Australian Journal of Environmental Education*) and publications specific to Early Childhood (such as the *International Journal of Early Childhood*, *Early Child Development and Care*, and the *Journal of Early Childhood Literacy*). One outlier (Nah & Lee, 2016) was published in *Action Research*. The articles included here represent six countries: Australia, Canada, South Korea, Sweden, the United Kingdom, and the United States (see Figure 1).

Preliminary analysis utilized Barratt Hacking et al.'s (2013) continuum of methodological approaches regarding research with children, ranging from research *on* children to research *with* children and, finally, research *by* children. For the purposes of this systematic review, research *on* children was not included as it did not meet the inclusion criteria of children's active involvement in the research process. Building upon the work of Green's (2015) systematic review, the articles included for review were organized along Barratt Hacking et al.'s continuum, see Table 3.

Figure 1
Articles by Location, per Country

Legend:
- 3 articles (United States & Sweden)
- 2 articles (UK)
- 1 article (South Korea, Australia, Canada)

Table 3
Included Articles Along the Continuum of Barratt Hacking et al.'s Childhood Research Approaches (Adapted from Barratt Hacking et al., 2013 and Green, 2015)

Research with Children		Research By Children	
Research is primarily led and interpreted by adults. Methods are designed to understand children's perspectives.	Research is participatory and collaborative and includes children's perspectives. Children participate in data collection but are not involved in other phases of the research project.	Children are engaged as co-researchers, throughout the project (i.e. beyond data collection). Methods and project design honors children's agency and active participation.	Children conduct and lead all stages of the research process "independent of adult intervention" (Barratt Hacking et al., 2013, p 439).
Williams et al., (2017) Haywood-Bird, (2017) Williams & McEwen, (2021)	Harwood & Collier, (2017) Nordén & Avery, (2020) Moore et al., (2021)	Nah & Lee, (2016) Green, (2016) Green, (2017) Postila, (2019) Postila, (2022)	

It is notable that none of the included articles meet the definition of Barratt Hacking et al.'s (2013) conceptualization of research authentically conducted by children. This may be because of the age of studies included focusing on early childhood, with all but two studies including children younger than six. However, this is not to suggest very young children are not capable of conducting their own research, merely that, as of this review, that work as not been reported.

Theoretical Foundations

A wide range of theoretical foundations underpinned the included articles. They have been grouped into categories (see Table 4). Articles that engaged children in the research project were grounded in theoretical foundations that take seriously the role of children as active agents and warn against the potential of tokenization of children's involvement in the research process. Three articles were strongly grounded in a theoretical paradigm (such as post-humanism), and seven utilized childhood theories to describe and position children as competent social actors (such as the New Sociology of Childhood). Four articles referenced the UN Convention on the Rights of the Child (1989, 2005), which asserts children's rights to participation in decisions that affect their lives. Finally, five articles cited learning theories such as experiential learning (Kolb, 1985) and place-based education (Sobel, 2020) to frame how children learn and engage with their world.

Table 4
Theoretical Foundations of Included Articles

Theory	Key Authors	Article
Theoretical Paradigms		
Post Humanist	Stengers (2010); Tsing (2015) Taylor (2013)	Postila (2022) Harwood & Collier (2017)
New Materialist	Haraway (2016) Taguchi (2014)	Postila (2022) Harwood & Collier (2017)
Situated Knowledge	Haraway (1988)	Postila (2022) Postila (2019)
Common Worlds	Taylor et al. (2013); Haraway (2004); Haraway (2008); Taylor & Giugni (2012); Pacini-Ketchabaw & Taylor (2015)	Harwood & Collier (2017)
Slow Science	Stengers (2018)	Postila (2022)
Relational Ontology	Stengers (2015); Stengers, (2018)	Postila (2022) Postila (2019)
Post-Marxist Critical Theory	None cited	Haywood-Bird (2017)
Childhood Theories		
Huizinga's theory of play and place	Huizinga (1949)	Moore et al. (2021)
Children's Social Capital	Wong (2017); Wood et al. (2013)	Williams & McEwen (2021)

New Sociology of Childhood	James (2009); James & Prout (1990)	Green (2017); Green (2016)
	James & Prout (1997)	Nordén & Avery (2020); Nah & Lee (2016)
	James, Jenks, & Prout (1998)	Moore et al. (2021)
	Barratt Hacking et al. (2013); Green (2015)	Williams et al. (2017); Green, (2016)
	Holloway & Valentine (2000)	Nah & Lee (2016)
Policy		
UN Convention on the Rights of the Child	United Nations (2005); United Nations (1989)	Moore et al. (2021); Green (2017); Green (2016); Nah & Lee (2016)
Learning Theories		
Constructivist	None cited	Haywood-Bird (2017)
Social constructivist	Rogoff (2003)	Nah & Lee (2016)
Experiential Learning	Kolb (2014); Kolb (1985)	Williams et al. (2017)
Active Learning Theory	Hart (2013)	Williams et al. (2017)
Transformative Learning Theory	Mezirow (1997)	Williams et al. (2017)
Social Cognitive Theory	Bandura (1986), Paton (2003)	Williams et al. (2017)
Place-Based Education	Smith, (2002); Sobel (2020); Woodhouse & Knapp (2000)	Nordén & Avery (2020)
Framework for Significant Learning	Fink (2013)	Williams et al. (2017)
Explorative Pedagogy	Vecchi (2010)	Postila (2022)

Notably, the majority of studies foreground the agency of children through the use of childhood theories. In doing so, the authors clearly established respect for the child as an active agent not only in the context of the research study but in society. Appropriately, the theoretical foundation often informed the role of the child in the research project (explored in detail below.) For example, Postila (2022) used Stengers' 'slow science' to position children as "the connoisseurs, the producers of local knowledge in their expertise of their preschools and their surroundings" (p. 279). Even articles that did not cite one of the childhood theories included in Table 3 (Harwood & Collier, 2017; Postila, 2019, 2022) explicitly named the participatory aims of the research study. However, these aims were not always fully actualized, as I will show below.

Methodological Approach

The included articles utilized a range of methodological approaches, though all involving qualitative data. Moore et al. (2021) used a comparative case study to compare children's perspectives on their outdoor play spaces at two childcare centers. Haywood-Bird (2017) used a critical approach to ethnography in her study of children's enaction and understanding of power in their outdoor play. Haywood and Collier (2017) reported on an ethnographic study exploring children's relationship with humans and nonhumans. Green (2016, 2017) used a phenomenological approach to understand children's experiences of their environment as a means of evaluating child-friendly data collection methods. Participatory action research was utilized in Williams et al. (2017), and Williams and McEwen's (2021) work to engage elementary school students in flood prevention education. Both Nordén and Avery (2021) and Nah and Lee (2016) utilized action research approaches to redesign outdoor play areas in their respective settings (a childcare center in Sweden and a childcare center in South Korea). Postila (2019, 2022) used a multidisciplinary approach and pedagogical working methods that were familiar to the children to explore water and water-related environmental issues. Additionally, Haywood and Collier (2017) and Moore et al. (2021) utilized the Clark and Moss (2021) mosaic approach, which identifies participatory tools to elicit children's perspectives.

Methods

A variety of child-friendly data collection methods were used to engage children in the research process. Three categories of data collection were identified: documentation, interviews, and observation. Documentation methods included those that involved the children documenting their own experiences and perspectives through the use of: GoPro Cameras (Green, 2016, 2017; Harwood & Collier, 2017); photography (Nah & Lee, 2016; Nordén & Avery, 2020; Postila, 2019); personal diaries or informal writing (Harwood & Collier, 2017; Nah & Lee, 2016; Postila, 2022), drawing, making models or making art (Green 2017; Moore et al., 2021; Postila, 2019, 2022), role play (Green, 2017), map making (Moore et al, 2021), site tours (Moore et al., 2021), sensory tours (Green, 2016, 2017) and field trips (Nah & Lee, 2016).

Interviews were another common method employed, though in a variety of ways with varying degrees of structure including informal conversations with children (Harwood & Collier, 2017; Nordén & Avery, 2020;) child-led interviews (Nah & Lee, 2016); Researcher-led interviews (Williams et al., 2017); group discussions (Nah & Lee, 2016; Williams et al., 2017; Nordén & Avery, 2020; Williams & McEwen, 2021); video-stimulated recall discussions (Green, 2016, 2017), storytelling (Postila, 2022), interviews with teachers (Nah & Lee, 2016; Nordén & Avery, 2020); and interviews with families (Haywood-Bird, 2017; Williams et al., 2017).

Finally, Nordén and Avery (2020) and Haywood-Bird (2017) used participant observation. Notably, all articles used multiple methods to both authentically engage children and draw on several data sources to support triangulation and verification. While the studies included utilized a range of approaches and often cited the participatory nature of these approaches, it appears that it is not the specific methodological approach or method used that indicates "research by" children, but the child's active involvement in the project before and beyond the data collection phase.

Role of the Child

Researchers utilized a range of strategies to engage children authentically in the research process (see Table 3). At a minimum, all studies sought children's assent to participation and utilized child-friendly data collection methods. However, this should be considered a baseline when the aim is research conducted *by* children. The studies included here provide promising examples of children's authentic involvement in the research process including selecting the issue of investigation, selecting data collection methods, directing the researcher's documentation (what they could or could not document), participating in data analysis, and sharing findings.

Table 3
Children's Involvement in the Research Process

Activity	Description	Article
Assent to participation	Opportunity to opt out of activities at any time.	All

Participation in child-friendly data collection methods	Children participate in data collection methods (described in detail below).	All
Issue selection	Children decide what issue or topic to focus on.	Green (2017)
Method Selection	Children choose which data collection methods to use for the study (from a set of methods presented by the researcher).	Nah & Lee, (2016); Green (2017)
Direct the researcher in documentation	Children decide what not to include in (or delete from) documentation for analysis and/or direct the researcher's documentation.	Harwood & Collier (2017); Postila (2019); Postila (2022)
Interpret the data	Researchers bring back data to children (sometimes in the form of video or photos) and have a discussion with the children to understand their perspectives on the experience.	Nah & Lee, (2016); Green, (2016); Green, (2017)
Share Findings	Children presented findings to families at the end of the project gathering.	Green (2017)

To ensure children's authentic and active participation, the researcher often had to release some amount of control over the research project. Doing so created meaningful opportunities for not only the children's involvement in, but also influence on, the research process, as demonstrated above in Table 3.

Role of Researcher

Most articles also explicitly detailed the role of the researcher in the study. This act of reflexivity appears to have been essential to successfully engage children in the research process because researchers had reflected on their positional power in the project as adults, and often as outsiders. Green (2017) aptly notes, "the way research is guided and facilitated by adults will greatly influence what children share or don't share in the process" (p. 7). Many of the other studies included also reflected on this reality (described in more detail below). Beyond mere acknowledgment, researchers intentionally crafted a role for themselves in the research project that made space for the children's enacted agency.

As these conceptualizations of the role of the researcher were analyzed, three categories emerged, participant observer, facilitator, and co-researcher, which were mapped onto Barratt Hacking et al.'s (2013) Childhood Research Approaches (see Table 4).

Several researchers acted as participant observers and did not involve children in the research process beyond data collection. They utilized primarily observation methods, though some included children's documentation (Harwood & Collier, 2017; Moore et al., 2021), and one included interviews with families (Haywood-Bird, 2017). In this role, methods were designed to elicit and understand children's perspectives, but the research process was primarily led and interpreted by adults.

Some researchers acted as facilitators and actively involved children in the data collection, often facilitating group conversations and processes with the children. In their work on flood prevention, Williams and McEwen (2021) and Williams et al. (2017) facilitated a flood education intervention and conducted researcher-led interviews with

children as well as interviews with families. In this role, children participated in the data collection, but again, the research process was primarily led and interpreted by adults.

Table 4
Continuum of the Role of the Researcher mapped onto Barratt Hacking et al.'s Childhood Research Approaches (Barratt Hacking et al., 2013)

Methodological Approach	**Research with Children**		**Research by Children**
Role of Researcher	**Participant Observer** Harwood & Collier (2017) Haywood-Bird (2017) Moore et al. (2021)	**Facilitator** Williams et al. (2017) Nordén & Avery (2020) Williams & McEwen (2021)	**Co-Researcher** Nah & Lee (2016) Green (2016) Green (2017) Postila (2019) Postila (2022)

Finally, some researchers acted as co-researchers with the children. In this approach, researchers made space for children's active involvement in the research process beyond data collection. Nah and Lee (2016) provide a robust description of their role as researchers,

> we acted as ''committed facilitators, participants, and learners'' rather than as neutral observers (Arieli, Friedman, & Agbaria, 2009). We not only observed but also participated in the activities involved in the development of the outdoor play area; accordingly, child participation was actualized. Specifically, we participated in the project by helping and offering assistance with the activities…We encouraged the parties involved in the project by providing ideas, searching for relevant resources when they approached us with problems, and cooperating in efforts to maintain a fundamentally democratic relationship, *in which all parties could exercise power and share control of the decision-making process* [emphasis added] (p. 340).

In this approach, the researchers constructed their role as specifically ensuring the children's active participation in not only data collection but the research process more broadly. Green (2017) similarly noted her role as making space for the children's discussion, input, and decision-making. Finally, Postila (2022) described her role as one of eliciting questions, creating the conditions for children's stories to emerge and be seen as valuable, and synthesizing the stories shared by the children while acknowledging who and how they were created (i.e., with the children). In this role, researchers intentionally engaged children throughout the research process by making space for their active participation. In addition to participating in data collection, children also contributed to issue selection, data analysis, and dissemination.

Challenges

The included studies identified several challenges to conducting research with and by children, including following the children's lead, social influence of the researcher, adult receptivity and buy-in, and coordination time and investment, each of which is described in detail below.

Following the Children's Lead

Though the theoretical foundations provided a strong grounding for the methodological choices regarding the role of the child as well as the role of the researcher, the reality of enacting those roles proved challenging. Postila (2019, 2022) found that staying with the children, their interests, and concerns was not easy but was worthwhile. She reflects, "as a researcher, at times I had to let go and lose control both of the research process as well as the data production" (2019, p. 224). This entailed allowing the children to continue their play or experimentation at times when the questions or inquires framed by the researcher were not taken up by the children, rather than forcing their engagement.

Further, engaging seriously with children in the research process, particularly around environmental issues, sometimes surfaced challenging ethical issues or questions. Postila (2022) notes this in her work exploring water with preschool children. The children posed challenging questions about who has access to clean water and the impacts when dirty water is ingested. As adults, it is important to recognize our own discomfort or limiting beliefs around children's capabilities to deal with difficult topics and instead follow their lead, supporting their inquiry in developmentally appropriate ways. As Williams and McEwen (2021) note, a lack of engagement with children around potentially challenging or emotional topics can, in fact, "convey hopelessness and instability to children who are searching for guidance and answers" (p. 1643). Following the children's lead requires taking seriously their questions and concerns and finding developmentally appropriate ways to engage with them in those concerns.

Finally, following the children's lead required flexibility. Green (2017) found that using an assigned schedule and grouping for the children to rotate through methodological activity centers "did not necessarily support children's autonomy in the project." (p. 10) This led her to allow the children to engage with the stations however they liked, which posed challenges of its own: overcrowding and completing work in the time allotted. However, it did allow for the children's freedom of choice and movement. Ultimately, Green (2017) recommends that "when opportunities arise, researchers should embrace children's innovations - doing so provides deeper insight into the life world of a child and honors children's agency in the process" (p. 18). While certainly more time-consuming, and requiring of a great deal of reflexivity, this flexible approach appears very important in supporting children's agency in the research process.

Social Influence of the Researcher

Many researchers reflected on the influence of their presence in the research project, given the unequal power dynamic between adult and child which may result in children responding to researchers in the way they believe is socially desirable or required. While in some ways unavoidable, it appears very important that researchers both acknowledge and do their best to ward against traditional power dynamics. Researchers utilized several strategies, including ongoing assent throughout the research project, reading children's body language to gauge assent in addition to verbal assent processes (Haywood-Bird, 2017), giving children agency over what is documented and how, and utilizing multiple methods to document a variety of perspectives and experiences (Green, 2017). Ultimately, Haywood-Bird (2017) noted that despite these efforts "not all dynamics of power and privilege between me and the children could not be erased" (p. 1018), making researcher practices of reflexivity, particularly regarding their power and role in the research process, even more essential.

Adult Receptivity and Buy-In

Notably, every article included in this review was conducted in the context of a school or early childhood care center. As such, all studies included, to some degree, teachers and families. While adult participation is not necessarily an inherent challenge, if all adults involved are not bought into the theoretical framing, particularly regarding children's agency and active role in the research process, it appears challenging to fully actualize the aims of the research project to be collaboratively conducted with or by children.

This can be due to a variety of factors. Nordén and Avery (2020) suggested that preschool teachers' lack of prior experience in Environmental Education led to an inability to engage with children's questions and interests, which posed challenges to the research process and recognized a tension between their children's curiosities and desire to enact their agency in the context of the project and the teacher's expectations for the children's participation. Further, they observed the adults involved with the project's "limited interest and curiosity to listen to what the children might be thinking during the activities" (Nordén & Avery, 2020. p. 328). This posed significant challenges and ultimately led to missed opportunities to involve the children and authentically understand their perspectives.

Nah and Lee (2016) recognized the larger cultural context also greatly influences how adults interact with the research process: "it is difficult to implement child participation initiatives in an authoritarian culture, where the notion of childhood as subordinate to adulthood has prevailed" (p. 348). Green (2017) also notes adults' and educators' misplaced instincts toward maternalism, thereby viewing children as vulnerable, innocent, and in need of protection. Challenges to adult buy-in include both individual and cultural factors that researchers should consider and address when aiming to implement research with and by children.

Coordination and Time Investment

Further, this approach that foregrounds children's agency takes time. Nordén and Avery (2020) found that educators' aim "was getting the work done quickly, rather than adding extra time and space for communication and engagement with the children" (p. 328). It seems evident that this work cannot be rushed, particularly if the aim is to authentically follow the interests and curiosities of the children. Nordén and Avery (2020) also recognized the need for significant coordination and planning time, which proved difficult to build into staff schedules. Nah and Lee (2016) similarly noted that the process of engaging adult participants takes time and investment beyond any one research project. This finding is also supported by Barratt Hacking et al.'s (2013) finding that time is needed to support the success of the research project to foster trust and relationships between children and adults and children and the research process.

Discussion

The purpose of this systematic literature review was to explore the theoretical and methodological approaches utilized in research conducted with and by young children in environmental contexts in the hopes of informing ongoing professional research practices that affirm children's agency and position children as agents of change. While the studies included utilized a range of theoretical and methodological approaches, it appears that it is not the specific methodological approach or method used that indicates research with or by children but the child's active involvement in the project before and beyond the data collection phase, which requires active reflexivity on behalf of the researcher to create space within the research process for the children's active involvement. Based on the analysis, several findings emerged regarding the role of the child and the role of the researcher.

Role of the Child

Researchers interested in conducting research with and by children ought to include children in the research process beyond data collection. As several articles included here show, children can be involved throughout the entirety of the research process, from topic selection, method selection, data collection, data analysis, and dissemination. The articles included in this review offer several exciting examples of ways to do so, with Nah and Lee (2016) and Green (2017) among the strongest approaches. Green (2017) includes a very thorough table detailing both the researcher and children's roles throughout every phase of the research process.

Role of the Researcher

Clearly articulating the role of the researcher, in addition to the role of the child, appears to be important in authentically conducting research with children. In explicitly naming the role of the researcher, unspoken power dynamics that may be assumed in the research process -- the researcher selects the topic of investigation, leads data collection, and has the ultimate say over what data is included in analysis -- are surfaced and more collaborative

processes and roles can be utilized. As noted above, a variety of researcher roles can be utilized in approaches seeking to conduct research with or by children.

Detailing the role of the researcher in the project, in particular the ways the researcher facilitates or potentially disrupts children's agency, provides important examples to other researchers seeking to work in this paradigm and mirrors Barratt Hacking et al.'s (2013) recommendation for active dialogue amongst children and adults involved in the research project around their respective roles. It appears a great deal of both reflexivity and flexibility on behalf of the researcher is needed to truly allow children's thoughts, curiosities, and interests to drive the investigation. For Postila (2022), "this involved challenges such as letting the child(ren)'s concerns matter, rather than starting in a predetermined matter of facts" (p. 296). If we are to truly engage children as co-researchers, we must make space for them in the research process – it is the responsibility of the researcher to create the conditions for children's stories, experiences, and opinions to emerge and to be valued.

Seeking Assent

Beyond seeking parental consent and children's assent at the beginning of the project, researchers should seek children's assent throughout the research project. As Green (2017) notes, "in this way, children were invited to choose what, if, and how long they wanted to engage in each particular research activity" (p. 8). Further, researchers ought to consider the use of child-friendly assent practices beyond verbal confirmation. For example, in Nah and Lee's (2016) study, children created their own post-it note consent forms that indicated if they were participating in the day's research activities. Moore et al. (2021) used a smiling or sad face form that the children ticked each time research was conducted. These examples offer age-appropriate ways to authentically gain children's assent to the research process. In the case of Nah and Lee (2016), the means for gaining children's assent (the post-it note) was created by the children themselves. This presents another opportunity for the children to be authentically involved in the research process by determining how they will give their assent to participate in the research process, as well as when and how they will participate in research activities.

Working with Teachers and Families: Creating a Culture of Co-Research

Research with children does not occur in a vacuum. In each of the studies included in this review, teachers and/or families were actively involved in the research process. As noted above, this can pose challenges as the dominant culture does not typically support young children's agency. Nah and Lee (2016) noted that researchers must both acknowledge this dynamic and actively work to "establish an inclusive participatory climate…creating a new way of viewing the relationship among researchers, educators, children, and staff members" (p. 348). While this work of culture building may seem tangential to the research process, it appears essential to ensure adults involved are equipped to support and respect children's active engagement in the research process.

Conclusion

This systematic literature review explored theoretical and methodological approaches, the role of the child and researcher, as well as challenges regarding conducting research with and by children. Researchers endeavoring to conduct research with and by children ought to deeply consider their role in the research project, examine and account for their positional power, and work with the other adults involved in the project to ensure children's agency can be enacted. Eight years after Green's (2015) review, examples of research *by* children are few, particularly in early childhood. While some promising examples exist (Nah & Lee, 2016; Green, 2017), the field of Environmental Education has not realized the potential identified by Barratt Hacking et al. (2013) for engaging children as active researchers. Much more work and research are needed that authentically includes children in every phase of the research process.

If we take seriously children's agency and internationally affirmed rights, we must move beyond research *on* children to authentic research with and by children that prioritizes children's participation and perspectives in every phase of the research process. Merely naming children's right to participation is not enough. Theoretical presuppositions must be embodied throughout the entirety of the research process for children's perspectives to come forward and their capabilities as co-researchers and change agents realized and respected.

References

Arieli, D., Friedman, V. J., & Agbaria, K. (2009). The paradox of participation in action research. *Action Research*, *7*(3), 263–290. https://doi.org/10.1177/1476750309336718

Burke, S. E. L., Sanson, A. V., & Van Hoorn, J. (2018). The psychological effects of climate change on children. *Current Psychiatry Reports*, *20*(5), 35. https://doi.org/10.1007/s11920-018-0896-9

Clark, A., & Moss, P. (2011). *Listening to Young Children: The Mosaic Approach*. Jessica Kingsley Publishers.

Davis, J. M. (2010). *Young Children and the Environment: Early Education for Sustainability*.

Cambridge University Press. https://doi.org/10.1017/CBO9780511845390

Dean, S. N., & Elliott, S. (2022). Urgency, equity, and agency: An assemblage of global concerns and interests in early childhood education for sustainability. *International Journal of Early Childhood Environmental Education*, *9*(2), 56–68.

Fink, L. D. 2013. *Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses*. John Wiley & Sons.

Galvan, J. L., & Galvan, M. C. (2017). *Writing Literature Reviews: A Guide for Students of the Social and Behavioral Sciences*. Routledge.

Green, C. J. (2015). Toward young children as active researchers: A critical review of the methodologies and methods in Early Childhood Environmental Education. *Journal of Environmental Education*, *46*(4), 207–229.

https://doi.org/10.1080/00958964.2015.1050345

*Green, C. (2016). Sensory tours as a method for engaging children as active researchers: Exploring the use of wearable cameras in early childhood research. *International Journal of Early Childhood*, *48*(3), 277–294. https://doi.org/10.1007/s13158-016-0173-1

*Green, C. (2017). Four methods for engaging young children as environmental education researchers. *International Journal of Early Childhood Environmental Education*, *5*(1), 6–19.

Greig, A., Taylor, J., & MacKay, T. (2013). *Doing Research with Children: A Practical Guide*. SAGE Publications, Ltd. https://doi.org/10.4135/9781526402219

Groundwater-Smith, S., Dockett, S., & Bottrell, D. (2015). *Participatory Research with Children and Young People*. Sage. https://doi.org/10.4135/9781473910751

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3), 575–599. https://doi.org/10.2307/3178066

Haraway, D. (2016). *Staying with the trouble: Making kin in the Chtulucene*. Duke University Press. https://doi.org/10.2307/j.ctv11cw25q

*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. https://doi.org/10.1177/1468798417712340

*Haywood-Bird, E. (2017). Playing with power: An outdoor classroom exploration. *Early Child Development & Care*, *187*(5/6), 1015–1027. https://doi.org/10.1080/03004430.2016.1223070

Helldén, D., Andersson, C., Nilsson, M., Ebi, K. L., Friberg, P., & Alfvén, T. (2021). Climate change and child health: A scoping review and an expanded conceptual framework. *The Lancet Planetary Health*, *5*(3), e164–e175. https://doi-org.uc.idm.oclc.org/10.1016/S2542-5196(20)30274-6

Holloway, S. L., & Valentine, G. (2000). Children's geographies and the new social studies of childhood. In: S. L. Holloway, & G. Valentine (Eds), *Children's geographies: Playing, Living, Learning* (pp. 1–26). Routledge. https://doi.org/10.4324/9780203017524

James, A. (2009). Agency. In J. Qvortrup, W.A., & M.S. Honig (Eds.), *The Palgrave Handbook of Childhood Studies* (pp. 34-45). Palgrave MacMillan.

James, A., & Prout, A. (Eds.). (1990). *Constructing and Re-Constructing Childhood: Contemporary Issues in the Sociological Study of Childhood*. Taylor & Francis.

James, A., & Prout, A. (1997). *Constructing and Reconstructing Childhood* (2nd ed.). Falmer.

Kemmis, S. (2009). Action research as a practice-based practice. *Educational Action Research*, *17*(3), 463–474. https://doi.org/10.1080/09650790903093284

Kemmis, S., Wilkinson, J., Edwards-Groves, C., Hardy, I., Grootenboer, P., & Bristol, L. (2014). *Changing Practices, Changing Education*. Springer. https://doi.org/10.1007/978-981-4560-47-4

Krasny, M. E., Lundholm, C., & Plummer, R. (2010). Environmental education, resilience, and learning: Reflection and moving forward. *Environmental Education Research*, *16*(5–6), 665–672. https://doi.org/10.1080/13504622.2010.505445

*Moore, D., Morrissey, A.-M., & Robertson, N. (2021). 'I feel like I'm getting sad there': Early childhood outdoor playspaces as places for children's wellbeing. *Early Child Development and Care*, *191*(6), 933–951. https://doi.org/10.1080/03004430.2019.1651306

*Nah, K.-O., & Lee, S.-M. (2016). Actualizing children's participation in the development of outdoor play areas at an early childhood institution. *Action Research*, *14*(3), 335–351. https://doi.org/10.1177/1476750315621610

*Nordén, B., & Avery, H. (2020). Redesign of an outdoor space in a Swedish preschool: Opportunities and constraints for Sustainability Education. *International Journal of Early Childhood*, *52*(3), 319–335. https://doi.org/10.1007/s13158-020-00275-3

Pacini-Ketchabaw, V., & Taylor, A. (Eds.). (2016). *Unsettling the Colonial Places and Spaces of Early Childhood Education* (1st edition). Routledge.

Pain, R., & Francis, P. (2003). Reflections on participatory research. *Area*, 35(1), 46–54.

*Postila, T. E. (2019). Water as method: Explorations of locally situated environmental issues together with preschool children. *Australian Journal of Environmental Education*, *35*(3), 222–229. https://doi.org/10.1017/aee.2019.27

*Postila, T. E. (2022). Stories of water: Preschool children's engagement with water Purification. *Cultural Studies of Science Education*, *17*(2), 277–299. https://doi.org/10.1007/s11422-021-10075-3

Rogoff, B. (2003). *The Cultural Nature of Human Development*. Oxford University Press.

Sheffield, P. E., & Landrigan, P. J. (2011). Global climate change and children's health: Threats and strategies for prevention. *Environmental Health Perspectives*, *119*(3), 291–298. https://doi.org/10.1289/ehp.1002233

Shier, H. (2001). Pathways to participation. *Children and Society*, 15, 107–117. https://doi.org/10.1002/chi.617

Stengers, I. (2010). *Cosmopolitics I*. (translated by R. Bononno). University of Minnesota Press. Stengers, I. (2018). *Another Science is Possible: A Manifesto for Slow Science*. (Translated by S. Muecke). Polity.

Taguchi, H. L. (2014). New materialisms and play. *Sage Handbook of Play and Learning in Early Childhood*, 79-9.

Taylor, A. and Giugni, M. (2012). Common worlds: Reconceptualising inclusion in early childhood communities. *Contemporary Issues in Early Childhood,* 13(2): 108–119.

Tsing, A. L. (2015). *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton University Press.

United Nations. (1989). Convention for the rights of the child.

United Nations. (2005). Convention on the rights of the child: General Comment No. 7. Implementing child rights in early childhood.

Vecchi, V. (2010). *Art and Creativity in Reggio Emilia: Exploring the role and potential of ateliers in early childhood education.* Routledge.

Walker, B., and Salt, D. (2012). *Resilience Practice: Building Capacity to Absorb Disturbance and Maintain Function*. Island Press.

*Williams, S., & McEwen, L. (2021). "Learning for resilience" as the climate changes: discussing flooding, adaptation and agency with children. *Environmental Education Research*, *27*(11), 1638–1659. https://doi.org/10.1080/13504622.2021.1927992

*Williams, S., McEwen, L. J., & Quinn, N. (2017). As the climate changes: intergenerational action-based learning in relation to flood education. *Journal of Environmental Education*, *48*(3), 154–171. https://doi.org/10.1080/00958964.2016.1256261

Wong, C. (2017). Conceptualizing the Emergence of Social Capital in Young Children. *Dissertations, Theses, and Capstone Projects*. https://academicworks.cuny.edu/gc_etds/2005

Wood, L., Giles-Corti, B., Zubrick, S. R., & Bulsara, M. K. (2013). "Through the kids . . . We connected with our community": Children as catalysts of social capital. *Environment and Behavior*, *45*(3), 344–368. https://doi.org/10.1177/0013916511429329

*Denotes articles included within the literature review.

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Appendix A: Summary Table

Authors & Year	Age Group	Country	Theoretical Foundation(s)	Methodological Approach	Method	Role of Child	Role of Researcher
Postila (2022)	3-5	Sweden	Post Humanist New Materialist Situated Knowledges Slow Science Relational Ontology Explorative Pedagogy	Multidisciplinary	Storytelling Children's Diaries Photography	Participated in issue selection and documentation.	Creating the conditions for children's active participation. Posing questions, documentation, synthesizing learning.
Williams & McEwen (2021)	7-9	United Kingdom	Children's Social Capital	Participatory Child Led Approach. Guided by Greig, Taylor, and MacKay (2012) and Davis (2015)	Group Discussion	Participated in the child-led, researcher facilitated discussions	Building rapport with the children, facilitating discussions. Project design, data collection & analysis.
Nordén & Avery (2020)	3-5	Sweden	New Sociology of Childhood	Participatory Action Research (Kemmis 2009; Kemmis et al. 2014).)	Photography Informal Conversations with children Group Discussions Interviews with Teachers Participant Observation	Participation in children's council (group discussions) and project implementations.	Navigated tension between positioning as expert, facilitator, and equal participant in the project.
Moore et al. (2019)	4-5	Australia	Huzinga theory of play and place New Sociology of Childhood UN Convention on the Rights of the Child	Comparative Case Study Mosaic Approach	Conversational Storytelling Drawing Site Tours Photography Artefact collection Map Making Wishing Stones	Participated in data collection	Led project design and analysis.
Postila (2019)	3-5	Sweden	Relational Ontology Situated Knowledge	"Pedagogical Working Methods"	Photography Drawing Field Notes	Participate in data collection, make decisions regarding	Decide with children what data sources to save or delete.

							what data sources to delete or save and which data to include in dissemination.	Facilitate research process, make space to follow children's interests and inquiries. Led analysis.
Green (2017)	3-6	United States	New Sociology of Childhood UN Convention on the Rights of the Child	Participatory Phenomenology	GoPro Cameras Creating Art Role Play Making Models Sensory Tours	Selected topic for investigation, selected data collection methods, participated in data collection, participated in data analysis through group discussion, shared findings with family members	Supported research process that made space for children's active engagement, prepared relevant materials given the children's decisions.
Harwood & Collier (2017)	Preschool	Canada	New Materialist Post Humanist Common Worlds	Mosaic approach (Clark & Moss, 2001)	Go Pro Cameras Photos Educator Journals Researcher notes Surveys Conversational Interviews	Documented their experiences with Go Pros and iPad. Directed researchers in what they could or could not document.	Led research design and implementation.
Haywood-Bird (2017)	2.5-5	United States	Post Marxist Critical Theory Constructivist	Ethnography with a critical lens	Participant Observation Field Notes Interviews with Families	Directed researcher away from their play when they did not want to engage.	Utilized noninvasive fieldwork to respect children's agency. Led research design and implementation.
Williams et al. (2019)	7-9	United Kingdom	New Sociology of Childhood Experiential Learning Active Learning Theory Transformative Learning Theory Social Cognitive Theory Framework for Significant Learning	Participatory Methodological Approach using Shier's (2001) 5 Stage Method	Intervention activity (making a flood box), interviews with children, interviews with families.	Participated in intervention and interview	Designed and led research project.

Green (2016)	3-6	United States	UN Convention on the Rights of the Child New Sociology of Childhood	Phenomenology	GoPro Camera, Sensory Tours, Video-stimulated recall discussions	Decide how, if and when to participate in data collection. Interpreted their experiences through group discussions.	Identified felt were relevant video clips to bring to the children for discussion. Facilitated discussion amongst the children.
Nah & Lee (2016)	5-6	South Korea	New Sociology of Childhood Social constructivist	Action Research with flexible, open-ended design	Photography, Field Trips, Drawing, Informal Writing, Child-led interviews, Educator-led interviews, Circle Time Discussions.	Children involved in issue selection (outdoor play space) and project management; children led theme development, investigation, and application phases of project	Committed facilitator and co-participant. Secured resources, supported children's agency and ensured a democratic process.