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May 2023

From the Editor

The spring 2023 issue of the *Journal of Montessori Research* is now available and includes two empirical research articles as well as two review articles. In the first article, Gerker investigates public Montessori school teachers' experiences with policies that influence their pedagogies, using qualitative research with a focus on how to better support Montessori teachers in public school settings. Authors of the second article—Lillard, Tong, and Bray—summarize results of an exploratory analysis of outcomes comparing results for Black, Hispanic, and multiracial preschoolers to those of White children on academic and social-emotional measures, like executive function and theory of mind, using longitudinal latent growth curve analyses.

The first of two review articles in this issue is a scholarly book review in which Campanelli offers an insightful evaluation of the recently published [Bloomsbury Handbook of Montessori Education](#). As I was one of the editors of the volume, I wish to thank Vanessa Rigaud for serving as guest editor for the handbook review. The second review article represents a new annual feature for the *Journal of Montessori Research* in which Moss and Parham review doctoral dissertations completed during the preceding year to raise awareness of these significant pieces of scholarship and their usefulness in the field.

Last fall, I encouraged those of you who are engaged in Montessori research to consider joining or renewing your [membership](#) in the American Educational Research Association (AERA) and the Montessori Education Special Interest Group (SIG). I am pleased to report that the AERA 2023 Annual Meeting in April had a strong Montessori presence that included a Montessori SIG research paper session, a roundtable session, and a business meeting. The Montessori SIG also hosted a booth in the exhibit hall and a reception for members. It was exciting to have the opportunity to discuss possible connections to Montessori research with this community of scholars, many of whom have had positive experiences with Montessori education but had not considered research in the area.

I close with gratitude for the American Montessori Society's (AMS) continued support for the *Journal of Montessori Research*. AMS funding for the publication since its inception in 2015 makes open access possible without requiring authors to pay article-processing charges.

Sincerely,



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Making Sense of Montessori Teacher Identity, Montessori Pedagogy, and Educational Policies in Public Schools

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Keywords: education policy, public schools, Montessori, Montessori fidelity

Abstract: Montessori teachers in public schools navigate a system daily that often does not align with their pedagogy, and district policies push them to stray from high-fidelity implementation. Using Weick’s sensemaking theory and literature on Montessori teacher identity, I contend that Montessori teachers’ identity plays a crucial role in how, or if, they respond to educational policies that may not seemingly align with the Montessori Method. The overarching purpose of this study was to understand Montessori public school teachers’ experiences with policies that influence their pedagogy. Through qualitative interviews and a culminating group-level assessment session, three themes emerged as teachers shared their experiences with educational policies: (a) Montessori pedagogy is more than the materials, (b) districts often force district-wide requirements that are at odds with the Montessori pedagogy, and (c) Montessori teachers in public schools do not feel supported. This article concludes with a discussion of how to better support Montessori teachers in public school settings based on the study’s findings.

Montessori public school teachers often teach in educational systems radically different from Montessori pedagogy. Public schools are subject to mandated policy requirements with which Montessori pedagogy does not naturally align. Although a wealth of research shows that Montessori education improves student outcomes, its success depends on the fidelity of implementation (Culclasure et al., 2018; Lillard, 2012; Lillard et al., 2017). Consequently, Montessori teachers daily traverse a system that often does not align with their pedagogy, and education policies may push their pedagogy to stray from high-fidelity implementation (Block, 2015).

Policies shape teachers’ daily work—whether they realize it or not—often creating challenges rather than supporting them while teaching (Perryman et al., 2017). In a 2015 study examining a public Montessori school’s response to accountability, one teacher commented, “We compromise what we believe in. We compromise what we teach” (Block, 2015, p. 51). At the same time, shifting pedagogies because of policies is not a unique concern for Montessori public school teachers. Many teachers from different pedagogical backgrounds experience the tension between policy and practice. For example, Ellison et al. (2018) sought to understand how teachers’ daily practice

informs their perspective on education policy. A problem that emerged from their study was bad policy, which they claimed focused on improving student outcomes but took away the educator's ability to individualize teaching (Ellison et al., 2018). Further, because of the pressure to raise student test scores and keep them up, public school teachers "devote large amounts of classroom time to test preparation activities" (Abrams et al., 2003, p. 18) and are shaping their curriculum to match standardized tests (Au, 2011). Therefore, the policies that mandate standardized tests are pushing the focus away from what is known as best practice in child-centered education, which results in a more teacher-centered pedagogy (Au, 2011).

Instead of individualizing teaching, teachers are teaching to the test and narrowing curriculum (Abrams et al., 2003; Au, 2011; Berliner, 2011; Levatino et al., 2023). Au (2011) described several studies that show how high-stakes testing narrows the instructional curriculum. For example, in a nationwide study by the Center for Educational Policy in 2006 (as cited in Au, 2011), 71% of districts reported eliminating at least one subject to spend more time on reading and math in response to the high-stakes testing mandated under the No Child Left Behind legislation.

Federal and state regulations, such as high-stakes testing mandates, are also the most salient challenges currently identified for Montessori public school teachers (Block, 2015; Valli & Buese, 2007; Williamson et al., 2005). Montessori teachers assess students primarily through observation, so standardized testing is not part of Montessori pedagogy. Thus, a well-documented challenge for public Montessori teachers is integrating required standardized tests into the Montessori Method (Block, 2015; Borgman, 2021). In addition to federal and state mandates, significant issues challenging Montessori public school teachers include finding and retaining teachers, budget cuts, and district support (Murray & Peyton, 2008).

Despite these challenges, principals in a 2008 study reported "being reasonably successful at living up to the ideals of establishing truly Montessori environments within public schools" (Murray & Peyton, 2008, p. 30). Further, landmark studies from Lillard and Else-Quest (2006) and Lillard et al. (2017) found that Montessori students scored better on standardized assessments in reading and math, which supports the findings from Dohrmann et al. (2007) that equal or better outcomes are possible when Montessori pedagogy is implemented with high fidelity. Indeed, in a study examining child-centered

pedagogies in general, Williamson et al. (2005) found that teachers "do not have to sacrifice high-quality, child-centered pedagogy" (p. 194) to manage the challenging requirements of high-stakes testing.

Although currently there is not one decided tool to measure fidelity in Montessori classrooms, Lillard and Heise (2016) examined the Montessori materials as an index of fidelity. To do so, they compared the use of only Montessori materials versus including supplemental materials in Early Childhood Montessori classrooms. In their study, they found a significant increase occurred in early reading and executive function in children in Montessori classrooms in which supplemental materials were removed. The children advanced slightly more in early math than in the classrooms where supplemental materials remained. Studies from Dohrmann et al. (2007) and Lillard and Else-Quest (2006) showed that a high-fidelity Montessori approach can effectively fulfill test-based accountability demands. It is unclear, though, how Montessori teachers manage policy challenges while implementing high-fidelity Montessori pedagogy. The guiding questions in this study went beyond whether Montessori pedagogy can be effective in public schools and sought to understand the space between policy and implementation (Perryman et al., 2017). In other words, how do Montessori teachers see themselves and their pedagogy regarding policy?

I used several aspects of my experiences in the field of Montessori education to understand how teachers see themselves and their pedagogy regarding education policy. As a parent of three students who attend public Montessori schools, I have experienced several shifts in pedagogy; at the same time, my children have been in public Montessori classrooms where the pedagogy is implemented with fidelity. As a credentialed Montessori teacher invested in the fidelity of Montessori education in public schools, I volunteered to serve on decision-making committees at our local school district. As a doctoral student of education policy, I am curious to learn how a Montessori teacher interprets policy and engages in advocacy. With these experiences in mind, I conducted a phenomenological interview study culminating with a participatory group method known as *group-level assessment* (Vaughn & Lohmueller, 2014). I intentionally designed broad policy- and pedagogy-related research questions because I viewed this study as a pilot for future research. The two research questions were as follows. How, if at all, does public Montessori teachers' pedagogy shift because of education policies? How do public

Montessori teachers perceive their capacity to engage in policies as the policies relate to the Montessori pedagogy?

In this article, I provide context for the many ways Montessori education may be defined. Then, I explain how the extant literature on teacher responses to policy and Montessori teacher identity gave rise to and justify the study's importance. Because a key aspect of the research explored how Montessori teachers navigate the public-school-policy landscape and reconcile it with their Montessori teacher identities, I used sensemaking theory (Weick, 1995) as the lens through which to interpret the data. I contend that a Montessori teacher's identity plays a crucial role in how, or if, they respond to educational policies that may not seemingly align with the Montessori Method and conclude this article with a discussion of ways to better support Montessori teachers in public school settings.

Inconsistencies in Defining Montessori Education

Implementing Montessori education with fidelity requires consistent practices, regardless of whether it is implemented in private or public schools or not. A Montessori learning environment includes core components: "concepts of freedom, structure, and order, reality and nature, beauty and atmosphere, the Montessori materials, and the development of community life" (Lillard, 1972, p. 51). Differing from other teaching pedagogies, the Montessori teacher's role is to connect the aforementioned core components of the classroom, prepare the environment, and guide student learning. Teachers conduct observations and use their findings to individualize student lessons and alter the environment. Maria Montessori (1995) noted the teacher "must have a kind of faith that the child will reveal himself through work" (p. 276). That is, a Montessori teacher must trust that students will learn and develop in an environment that has been carefully prepared for them.

Montessori Public Policy Initiative, a collaborative project of Association Montessori Internationale/USA (AMI/USA) and the American Montessori Society (AMS), developed guidelines that reflect authentic implementation of Montessori education (Montessori Public Policy Initiative [MPPI], 2015). The guidelines include describing Montessori environments grouped in multigrade levels in classroom communities: preschool to kindergarten (3 to 6 years old), first to third grade, fourth to sixth grade, and so on. Multigrade-level grouping allows peer teaching and modeling while teachers work one-on-one or with small groups of students. In addition, the guidelines refer to a "full complement of Montessori

materials" as a requirement for authentic implementation (MPPI, 2015, p. 1). The Montessori materials are designed to provide many of the core components while focusing on a whole-child developmental approach (Montessori, 1964). The materials are hands-on, moving from concrete to abstract, which allows independent student learning. As Block (2015) explained, "the Montessori curriculum is interconnected, cross-disciplinary, hands-on, and experiential" (p. 44).

Although defining Montessori education may seem straightforward, a scholarly literature review shows some inconsistencies. For example, Lillard and Else-Quest (2006) defined authentic Montessori programs as those recognized by AMI/USA, whereas Begin (2014) established Montessori programs as those that meet at least 75% of the criteria listed in guidelines, once known as the Essential Elements of Successful Montessori Schools in the Public Sector, set forth by AMS, Montessori Educational Programs International, the North American Montessori Teachers' Association, the Southwest Montessori Training Center, and AMI/USA. Other studies described critical elements of the pedagogy in their definitions, such as 3-year age spans and multiple age groupings in classrooms, teachers who are trained in Montessori education, and a prepared environment where children can move freely, selecting work and returning materials to shelves when finished (Block, 2015; Dohrmann et al., 2007; Lillard & Else-Quest, 2006; Whitescarver & Cossentino, 2008). Some of these elements are identified in the AMI guidelines (Lillard & Else-Quest, 2006) and the Essential Elements of Successful Montessori Schools in the Public Sector (Begin, 2014), yet definitions are not congruent. In addition, Murray and Daoust (2023) noted that although researchers provide evidence of the Montessori environments they study, as previously described, there is not a widely accepted tool for assessing the fidelity of Montessori education. Further, there is no one governing body that enforces the quality of all Montessori education in the United States or that ensures that the Montessori curriculum is followed in schools. Without copyright on the definition of Montessori education, any school can claim to use the Montessori Method (Debs et al., 2022; Whitescarver & Cossentino, 2008).

Debs et al. (2022) examined the inconsistencies of how the Montessori Method is defined by scholars and Montessori organizations. They noted that Montessori organizations around the world hold "varying degrees of adherence to Montessori's original ideas" (p. 2). Educators have different pedagogical preferences situated

in different geographical and cultural contexts that add to the complexities of a common definition (Debs et al., 2022).

Literature Review

Teacher identity plays an important role in how a teacher interprets education policy. Therefore, I include previous literature on Montessori teacher identity and teacher response to education policy in this review of the literature.

Teacher Identity

Although the extant literature on professional teacher identity is expansive, defining teacher identity is challenging (Akkerman & Meijer, 2011; Beauchamp & Thomas, 2009). However, many scholars agree that teacher identity is not fixed; instead, it is dynamic, shifts over time, and is influenced by various factors (Akkerman & Meijer, 2011; Beauchamp & Thomas, 2009; Beijaard et al., 2004; Sachs, 2005).

Beijaard et al. (2004) conducted a literature review on teacher professional identity. They collected 25 studies to understand teacher professional identity and teacher education programs' role in forming teacher identity. They found that the formation of professional identity is an ongoing process, one that is determined by "competing perspectives, expectations, and roles" that teachers "confront and adapt to" (p. 115). Similarly, Beauchamp and Thomas (2009) explained that teachers experience many shifts in identity due to interactions with their school communities. Beijaard et al. (2004) and Beauchamp and Thomas (2009) agreed that teacher education programs must effectively address professional identity with student teachers.

Montessori teacher preparation, on the other hand, pays substantial attention to the inner preparation of the teacher, transforming the adult's thoughts and ideas toward learning, thinking, and human relationships (Christensen, 2019; Cossentino, 2009). This shift in understanding and attitude is crucial to the identity and pedagogy of a Montessori teacher. Montessori (2012) described the "real preparation" of a Montessori teacher as "the study of one's self" (p. 132). She further explained, "The training of the teacher who is to help life is something far more than the learning of ideas. It includes the training of character; it is a preparation of the spirit" (p. 132).

The transformation Montessori often wrote about was specific not only to the spirit of the teacher but also

to the adult's attitude toward learning and relationships (Christensen, 2019; Cossentino, 2009; Montessori, 1995). A Montessori teacher's attitude toward learning must transform from seeing the student as an empty vessel to be filled with content and knowledge. A Montessori teacher sees the student as a human being in which the teacher's role is to "ensure every child shall make the best of himself" (Montessori, 1995, p. 285). Montessori teachers understand their role in supporting students in reaching their highest level of intellectual and emotional development to be contributing members of society (Montessori, 1964, 1989, 1995). Christensen (2019) elaborated on the preparation of the teacher as central to the Montessori pedagogy, noting that Montessori clearly defined "who a Montessori teacher should be" (p. 47). At the same time, Christensen (2016) noted that Montessori teacher transformation is about what happens inside the classroom. It does not include external contexts such as partnering with families or navigating policy.

Teacher Policy Interpretation

All teachers, not just Montessori teachers, navigate policy in their daily practice and in several different ways. The scholarly literature on teacher policy interpretation is often grounded in theories such as street-level bureaucracy (Lipsky, 2010), policy actors (Ball et al., 2011; Ellison et al., 2018), and sensemaking theory (Weick, 1995). Lipsky (2010) referred to teachers as street-level bureaucrats because they have a direct connection to the people for whom policies were, in theory, created. However, street-level bureaucrats are interpreting the policy at the direct point of impact. Teachers, as street-level bureaucrats, struggle with the dilemma of treating all students the same but also individualizing learning in a standard system (Hohmann, 2016). Maynard-Moody and Musheno (2003) referred to this as a "dual existence of law abidance and cultural abidance" (p. 4), where teachers' beliefs rub against rules and policies. For example, street-level-bureaucracy theory includes teachers responding to accountability policies by creating consistent routines and rationing resources. Yet Anagnostopoulos (2003) found that teachers reported losing instructional time to testing and did not believe that the district policies shaped the curriculum they valued in their teaching.

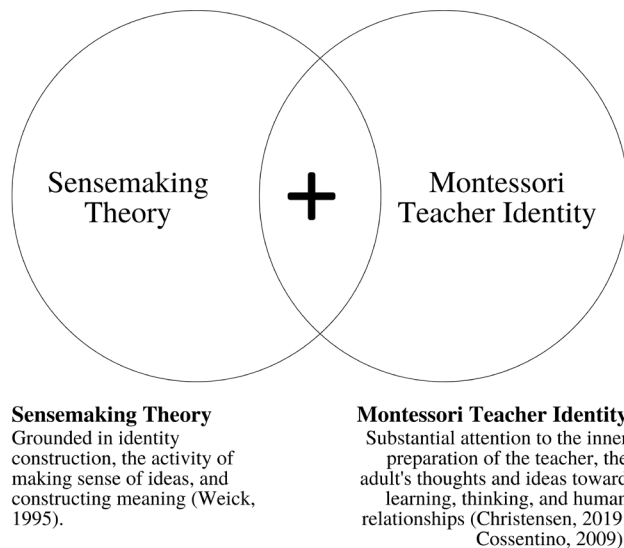
Ball et al. (2011) described several policy actor roles a teacher may play, such as the entrepreneur whose policy work includes advocacy and creativity. In contrast, another teacher may be a receiver, whose policy work

includes coping and defending. Participants in the Ellison et al. (2018) study shared a belief that policies that claim to be focused on improving student outcomes, such as standardized testing, take away their ability to individualize teaching and are more focused on a one-size-fits-all approach. In other words, current educational policies are doing more harm than good.

Theoretical Framework

Regardless of the policy-interpretation theory, teachers are the most vital link between policy and practice (Hohmann, 2016). The way in which teachers interpret or make meaning of policy directly affects their pedagogical decisions and student learning. Grounded in individual and social experiences, sensemaking theory supports understanding teachers' dynamic processes to make meaning of education policies that shape their pedagogy and adjust their advocacy actions (März & Kelchtermans, 2013; Weick, 1995). Therefore, sensemaking theory and literature on teacher identity informed the theoretical framework of this study, as shown in Figure 1.

Figure 1
Theoretical Framework



Sensemaking theory refers to the ways in which people make sense of ideas in their environment and enact those ideas in meaningful ways (Rom & Eyal, 2019; Weick, 1995). Further, sensemaking “determines what people see and do and what they perceive to be real, and why people give different interpretations to the same events or the same interpretations to different ones” (Rom &

Eyal, 2019, p. 63). Thus, the way teachers make sense of policies is influenced by their connection to policy messages and through the lens of preexisting beliefs and experiences, which inform a teacher's identity (Coburn, 2004, 2005). For example, Rom and Eyal (2019) elaborated on teacher-identity conflicts that shaped policy implementation and articulated new ideas about how teachers construct meaning. In their study, the focus was on early childhood teachers. Through experiences with policy, teachers shared internalized feelings about pedagogy and values, which led to shaping how they viewed themselves as early childhood professionals (Rom & Eyal, 2019). If educators could successfully reconcile their professional identity with complex policy understandings, they felt a sense of achievement. If not, they felt “disappointed, devalued, defeated, or expressed a desire to dissociate” (Rom & Eyal, 2019, p. 72). Additionally, teachers may question their pedagogical identity according to how a policy is enforced (Coburn, 2005; Rom & Eyal, 2019).

As Weick (1995) explained, it's important to note that sensemaking and interpretation are not the same. Sensemaking is an activity, whereas interpretation is more likened to a process—a process that is detached from the activity. Teachers must be actively engaged to make sense of policies effectively; they must see themselves in the policy before interpretation. Otherwise, teacher response to policies may be simply translating an idea in a new way rather than grounded in their pedagogy. Further, one distinguishing characteristic of sensemaking theory is that it is rooted in identity construction. Teachers learn more about their identities through experience and observation of those experiences; through attempting to shape and react to environments simultaneously; and through recognizing that their identity, rather than the experience, is what actually needs to be interpreted (Weick, 1995). Therefore, policy implications are defined by the Montessori teacher's identity. This understanding guided the analysis of the qualitative interview and group-level assessment data, focused on public school Montessori teacher experiences with policies.

Methods

Following fundamental phenomenological concepts such as describing a person's experience in the way they explain it (Bevan, 2014), I relied on multiple interviews with each participant to examine teacher experiences with education policies (Read, 2018). I then used themes from

Table 1
Participant Demographics

Pseudonym	No. of years teaching	Level	State
Jill	6	Early Childhood (preschool/kindergarten)	Ohio
Claire	13	Early Childhood (preschool/kindergarten)	Ohio
Kathy	22	Lower Elementary (1 st , 2 nd , & 3 rd grades)	Ohio
Tammy	27	Upper Elementary (4 th , 5 th , & 6 th grades)	Ohio
Flo	7	Upper Elementary (4 th , 5 th , & 6 th grades)	Illinois
Allie	6	Middle School (7 th & 8 th grades)	North Carolina
Noah	12	High School (11 th & 12 th grades)	Wisconsin
Ashley	2	High School (11 th & 12 th grades)	Wisconsin

Table 2
Serial Interviews

<i>Week 1</i>		
Interview 1	Focused on the participant's Montessori teaching history	Montessori teacher identity
<i>Week 2</i>		
Interview 2	Focused on the participant's detailed experiences with policy	Montessori teacher's response to policies
<i>Week 3</i>		
Interview 3	Focused on the participant's making meaning of perceived experiences	Sensemaking theory

the interviews to develop the protocol for a modified group-level assessment process with participants (Vaughn & Lohmueller, 2014).

Participants

Using snowball sampling, eight noncharter, public school Montessori teachers, outlined in Table 1, were recruited from four states.

Data Collection and Analysis

I conducted 30-minute semistructured interviews over 3 weeks, one interview per week. This format, known as *serial interviews*, made participation feasible for teachers with limited time to participate (Read, 2018). The extra time between each interview also allowed for researcher reflexivity practices such as writing memos and initial readings of data. Each interview was designed to capture a different aspect of the participants' experiences, as outlined in Table 2.

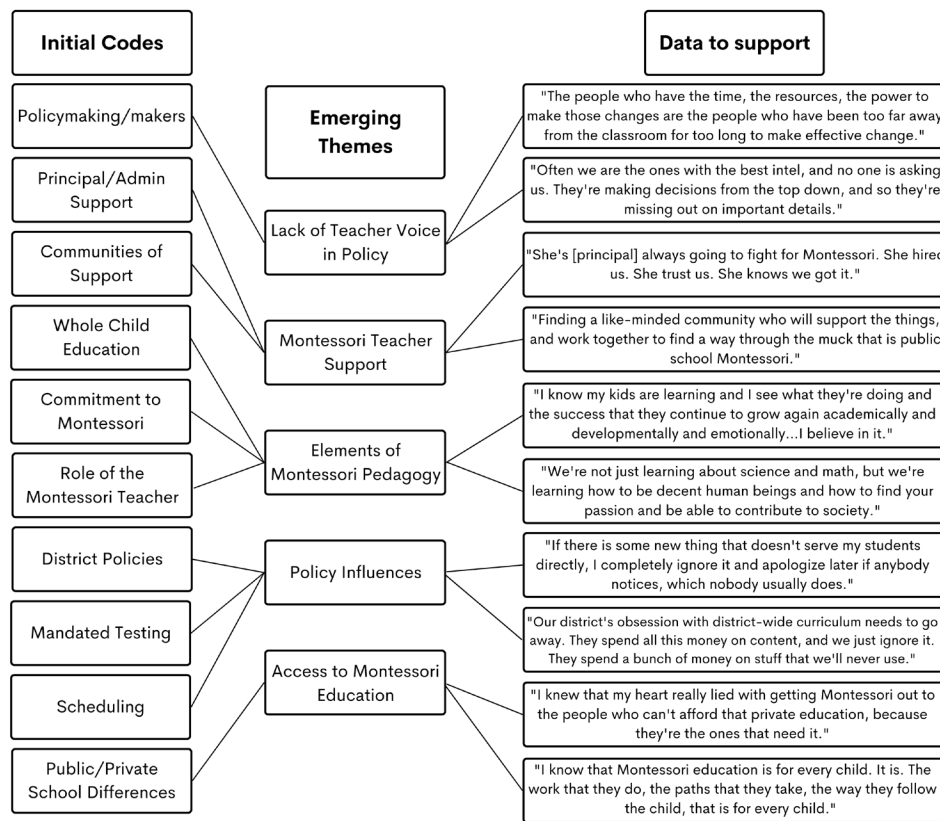
Data collection and analysis occurred concurrently. To analyze the data, I used a thematic analysis approach (Braun & Clarke, 2006). After each week of interviews, I read transcriptions, familiarized myself with the data, and began generating initial codes. By conducting an

analysis between each interview, I could explore different aspects of participant experiences and double-check the information shared in each interview (Read, 2018). Participants also received transcripts of their interviews for member checking (Lincoln & Guba, 1986). Upon completion of all interviews, I continued with data analysis and identified emerging themes through the generated codes. Figure 2 outlines initial codes, emerging themes, and supportive example data.

Finally, I facilitated a virtual modified *group-level assessment (GLA)* with interview participants. A GLA is a participatory group method used to collaboratively generate and analyze data through developing community and leading to action steps (Vaughn & Lohmueller, 2014). The goal of the GLA was to enhance awareness of policy issues, connect participants in their advocacy engagement, and validate themes from the interview data. All participants were invited to the GLA; however, because of time and capacity, only three participants attended (Kathy, Jill, and Allie).

The Appendix shows the prompts developed from the themes identified through the interview data analysis. Participants responded to each prompt and then reviewed and analyzed their responses to identify themes. The

Figure 2
Interview Data Analysis



GLA participants synthesized their responses through three themes: elements of Montessori pedagogy in which “it’s more than the materials,” districts attempting to “force a square peg in a round hole,” and lack of respect for teachers’ expertise at the district level. Four themes I identified in the interview data align with the themes identified by GLA participants, as shown in Table 3. These themes are discussed further in the next section.

Findings

The overarching goal of this study was to understand Montessori public school teacher experiences with policies that influence their pedagogy. Through interviews and a culminating group-level assessment session, three themes emerged as teachers shared their experiences with educational policies: Montessori pedagogy is more than the materials, districts often force district-

Table 3
Theme Alignment Between Interview Data and Group-Level Assessment

Group-level assessment themes (identified by teachers)	Themes from interview data (identified by researcher)
Elements of Montessori pedagogy—it’s more than the materials"	Elements of Montessori pedagogy
Districts "force a square peg in a round hole"	Policy influences and Montessori teacher support
Lack of respect for teachers' expertise at the district level	Lack of teacher voice in policy

wide requirements that are at odds with the Montessori pedagogy, and Montessori teachers in public schools do not feel respected or supported.

It's More Than the Materials

Implementing high-fidelity Montessori education in public schools requires a commitment to the Montessori pedagogy by the district, school, and teacher. It also requires an understanding of Montessori education, beyond the materials in the classroom. Seven participants spoke at length about their commitment to the Montessori pedagogy, regardless of the school or district in which they work. Flo shared, "I'm a Montessori teacher. If you don't want me here, just get rid of me. Do what you got to do. I'm not going to water myself down." Other participants used phrases such as "firm believer in Montessori" and "I believe in the potential of everything that Montessori offers." Claire reported how she prioritizes Montessori pedagogy by stating, "I put the philosophy first and the standard second. . . . I know what works for kids." When asked what it means to be a Montessori teacher, all eight participants spoke of whole child education. Allie explained, "We tend to silo them [subjects], but they really all work together. . . . It's the education of the whole child and not just worrying about, can you calculate the area of a circle?" Noah further elaborated, "You don't just teach science, you're trying to integrate it with everything else and do larger projects. And educate the whole child rather than just teach them the parts of the cell. To educate the whole child, we have to care about more than test scores." As Flo explained,

The goal is to make whole human beings. . . . It's an entire system set up to help children be successful in their own lives. I just don't know how you manage to do that if all you really care about is math scores and reading scores. You just don't. I'm a whole human being, and I have way more shoved into me than math and reading.

At the same time, participants shared that Montessori education is not just about using the Montessori materials to teach. Whole child education requires more. As Flo explained, it requires "more time and energy and love and passion." Further, four of the participants talked about teacher training when asked what it takes to be a Montessori teacher. Similarly, Ashley shared, "It's not like you have to have these crazy resources to implement it. You just need to know how to do it." Yet, three

participants also shared that it is not a requirement to have a Montessori teaching credential to teach at their school.

Tammy spoke of being taught to use the Montessori materials to teach but also shared that she would like to see more for public school Montessori teachers to "understand how to connect and engage all learners, and pull out the genius that is inherently in each child." Ashley also shared her frustration with the lack of credentialed Montessori teachers at her school: "If we are a true Montessori high school, then we should truly have all the teachers trained to be a Montessori teacher." Additionally, GLA prompt responses included a call for more Montessori-specific professional development in the district.

Forcing a Square Peg in a Round Hole

Although the phrase "square peg in a round hole" was from a GLA prompt response, many participants spoke of their school districts using a one size fits all approach that is at odds with the Montessori pedagogy. District-wide requirements were a common challenge that participants shared as influencing their pedagogy. Further, the role the administrator plays in supporting teachers is paramount to implementing Montessori pedagogy with high fidelity in public schools.

District-Wide Requirements

This study set out to focus on educational policies in general. However, participants spent most of their time in interviews specifically talking about district policies that influence their pedagogy in the classroom. For example, mandated testing layered on top of already-mandated state tests is a common challenge. In Montessori public schools, teachers feel this pressure twofold because standardized testing is not part of Montessori pedagogy. Kathy shared, "I think there needs to be some form of accountability, but that we have MAP [Measures of Academic Progress] testing, and we have state testing, and we have DIBELS [Dynamic Indicators of Basic Early Literacy Skills], and we have all these facets, and kids are just overloaded."

At the same time, several participants commented on how they feel about testing and how their Montessori pedagogy does not necessarily need to shift. For example, Allie said, "I think there is a level of standardized testing and accountability that is not a bad thing." She went on to share how teachers could use testing differently to better align with the Montessori pedagogy: "We don't use it

[testing] to look at a child, not for deficiencies, but from a growth standpoint and seeing how far they've come and where we can use it, reflectively on our teaching practices rather than punitively." Kathy further explained the connection between her commitment to the Montessori pedagogy and mandated testing:

I feel like if you're a really strong Montessori teacher, the test shouldn't tell you anything you don't know about your kids because you're so engaged with what your kids are doing. I'm working with my kids one on one all the time. So, when I see that they don't know something, it's like, yeah, I know they don't know that.

Allie also showed her commitment to Montessori pedagogy through mandated testing requirements by sharing,

I'm able to very confidently say to parents, I hear you on your testing concerns, but I can promise you, no matter where your child chooses to go or what they choose to do, they will be prepared. And being prepared is so much more than a test score, and a GPA and a test, an end-of-the-year standardized test.

Beyond testing requirements, Ashley and Noah explained their struggles with the building schedules that limit their time with students to 60–90 minutes each day. They both independently described how they observe students struggling to get in the flow they need to work on projects for longer periods of time—a core tenet of the Montessori philosophy (Montessori, 1964). Noah further explained a shift to their building's schedule that was made specifically because of attendance procedures; front office staff need to locate students quickly, block scheduling is confusing, and "attendance means dollars [to the district]."

Participants also described different ways they respond to district-wide requirements. Claire shared, "If there is some new thing that doesn't serve my students directly, I usually completely ignore it and apologize later if anybody notices, which nobody usually does." Flo explained a new scope and sequence the district said all schools had to follow. She worked with colleagues in her building to show the district how Montessori education hits all standards. Flo reported, "It was a legitimate three-year battle to even get them to sit down in a meeting with us and look at our scope and sequence to prove that we are actually doing what they want us to do." Finally, Jill

described a discipline committee attempting to develop a district-required school-wide acknowledgment system. Rather than rooting the system in rewards, the committee is working to develop a more intrinsically motivated system in better alignment with Montessori philosophy.

Several participants also often used the phrase "prove ourselves" when talking about district-wide requirements. Kathy stated, "We're still having to jump through hoops to prove ourselves. Why do you keep creating more magnet schools for families to choose if you clearly Why would you do that if you don't believe in something?" Claire simply stated, "I'm tired of proving my worth."

Support From Administration and Colleagues

Creating and finding communities of support is crucial to the well-being of teachers. Flo and Claire both talked about the importance of "like-minded communities" to support their work as Montessori teachers in public settings. For Flo, that support comes from a mentor who she explains as "very much my school self-care [in] that she's doing the same thing [as me], but she's also [10 years my senior] in teaching and in age. And she's a great mentor." For Claire, support comes from

... other teachers in my building or in the district, really. And I think that's as far as it goes. There aren't resources within the district for us to reach out to touch base with. And it's between myself and my colleagues.

A key person in the support system of a public school Montessori teacher is the school administrator. Of the eight participants in the study, only four had Montessori-credentialed administrators. Kathy and Tammy shared in their interviews that they believe teachers need administrators who understand Montessori education, but more importantly they describe a need for administrators to believe in the pedagogy. The GLA responses also affirmed this. Flo said her Montessori-credentialed administrator is "always going to fight for Montessori." However, according to several participants without credentialed Montessori administrators, their administrators are committed first to the district and then to the Montessori pedagogy. For example, Allie explained how her administrator deals with district demands that do not align with Montessori pedagogy:

I think some of it is that there just isn't enough experience with Montessori to really be able to understand how it could affect us, that the changes

are just kind of made and we are left to pick up the pieces and solve the problems around the change so that it meets the needs of our students.

Noah further elaborated:

Montessori administrators, or administrators in general, need to default back and hold the district line because at the end of the day, they want to keep their jobs . . . because even though we would hope that they go to bat for the school, our boss still [has] 20 years or 15 years left in the district. She wants to remain in her job.

Claire and Jill explained experiences with shifting the way they teach when a non-Montessori credentialed administrator is observing them. Claire shared,

Even though I am somebody who puts zero weight in any of the ratings, I still want my principal to know that I do a good job. And so I feel like I need to meet those metrics because that's her language to understand that I do a good job.

Jill shared a similar experience in that she often extends lessons to include the whole group for longer periods of time when being observed by her non-Montessori credentialed administrator.

Ultimately, all teachers who participated in this study explained the importance of connecting with other teachers and colleagues in their districts. Allie explained,

We can't just hide in our classrooms anymore and hide in our little schools and be under the radar That's also not helping the world of public Montessori, if we're constantly hiding ourselves under a rock and keeping ourselves hidden there.

At the same time, the capacity to connect with other Montessori teachers, to ask for support, and to interact beyond the classroom walls was dependent on the years of teaching experience participants had. For example, Allie, who had been teaching in a Montessori classroom for only 2 years, shared, “There’s still so much I just don’t know, and I don’t know how to even go about raising my concerns sometimes.” She further elaborated on her confidence in speaking up when a rule or procedure does not align with her Montessori pedagogy: “I feel like it will be 5 years before I truly feel like, okay, that is what I’m thinking, this is how I’m going to say it, this is

who I’m going to say it to.” Jill, who has been teaching in a Montessori classroom for 6 years, felt a sense of what she referred to as “a bigger purpose” and joined a local nonprofit Montessori organization that specifically focuses on professional development for Montessori teachers. However, she shared that she still has “no idea outside of that where to go, who to contact, anything like that” to respond to policies outside of her district. On the other hand, Claire and Kathy with 13 and 22 years of Montessori teaching experience respectively, both exhibited a high level of confidence in their Montessori pedagogy. They seemingly navigate policies while prioritizing the Montessori pedagogy—although, they struggle with the tension the policy systems cause. Beyond connecting outside of their classrooms, building and maintaining the confidence to advocate for Montessori education, teachers also need to feel respected.

Lack of Respect for Teacher Expertise

Four participants spoke of the “people who make the policies” as being far removed from the classroom and often do not have a Montessori background. Flo described this as a huge separation between practice and policy, and Kathy referred to it as a “disconnect from the reality of what is happening in the classroom.” Top-down decisions seem to be commonplace; Tammy said, “We [teachers] are the ones with the best intel and no one is asking us.” Claire elaborated on the top-down decision makers and described how teachers with current experiences in the classroom do not have “energy or resources to put into making change happen.” She also said, “If there’s a way for us to meet in the middle, okay, great!” On this note, the GLA participants developed one key action item from their themes: districts should create Montessori advocacy committees at each Montessori school in the district.

Discussion

This study sought to understand Montessori public school teachers’ experiences with policies that influence their pedagogy. Key findings include a common misunderstanding by district leadership and policymakers that the Montessori pedagogy is simply the use of specific Montessori materials. In fact, the Montessori pedagogy is much more than just the materials. It includes many components, such as freedom and structure and the development of community (Lillard, 1972). Two additional findings in this study include (a)

school districts often force district-wide requirements on Montessori schools that are at odds with the Montessori pedagogy, and (b) Montessori public school teachers do not feel respected or supported. These two findings are intricately connected; if district leadership honored the experience of Montessori teachers in their district, it would realize different policies are needed for different pedagogies. Further, tensions created by policy misalignment do not occur only between the pedagogy and the policy. The identity of the Montessori teacher plays a crucial role.

To further my interpretation, I turned to the literature on teacher identity. A Montessori teacher is taught to be dedicated to self-reflection, inner preparation, and whole-child education. This is the lens in which a teacher makes sense of policies. If Montessori teachers have internalized that the Montessori pedagogy is more than materials and their district or school is fully committed to the pedagogy, then they are more likely to feel confident in implementing high-fidelity Montessori education, regardless of district policies that do not align. The multiple layers of teacher support and district leadership decisions must overcome the Montessori teacher's possible uncertainty about their identity (Christensen, 2016; Malm, 2004). Additionally, teachers' professional identity is at the core of their work, providing insight for how to act and understand (Sachs, 2005). When teachers are often at the bottom of the policy hierarchy and constantly feel they need to prove the value of their identity, they struggle to make sense of policies and of their experiences (Christensen, 2016; Ellison et al., 2018). Moreover, Beauchamp and Thomas (2009) explained that teachers experience many shifts in identity because of interactions with their school communities. In this way, teachers lean on each other to make sense of their work environments and their own identity.

During the interviews in this study, I intentionally defined policies as any rule or regulation that is imposed on teachers. Although participants often referred to federally and state-mandated standardized testing as a key challenge, the most salient challenges identified in this study were directly related to district-specific policies, highlighting the need for continued research to understand Montessori public school teachers' experiences with district-specific policies.

Limitations

This study contributes to the literature by attempting to fill the mostly unexplored area of Montessori teachers' pedagogy and their experiences with policies, but it is

also important to acknowledge limitations. First, my experiences as a Montessori parent, teacher, teacher educator, and advocate may have influenced the questions and comments in interviews. For example, in one interview Jill shared how she did not think she did much to advocate for Montessori education. Considering the advocacy work I was previously involved in, I pointed out times when Jill had, in fact, been a strong advocate for Montessori education. Engaging in reflexivity to embrace my positionality was crucial to the study's process (Holmes, 2020). Second, all participants were recruited from Montessori conferences and through snowball sampling. Therefore, many of the participants may have had experience in advocating for Montessori education prior to the study. Prior advocacy experience was not considered before recruitment but may shift the findings if all teachers report high levels of advocacy engagement. Finally, only three participants participated in the GLA. The GLAs are designed for larger groups, yet the small group in this GLA produced meaningful qualitative results while building community among the participants (Vaughn et al., 2011).

Conclusion

Teachers and educators in many Montessori public schools have found ways to respond to policies while also upholding high-fidelity Montessori education (Block, 2015; Jackson, 2022; Murray & Peyton, 2008; Scott, 2017). For example, Jackson (2022) found teachers working together with creative scheduling and participating in Montessori-specific professional development from their district. This study builds on these efforts by increasing district leaders' and administrators' understanding of the pedagogical uncertainties that Montessori teachers experience in public schools to inform supportive policies for the Montessori pedagogy, rather than policies that require teachers to shift the Montessori Method. School districts can show their commitment to high-fidelity Montessori education and Montessori teachers in several ways, as discovered through this study's findings. First, school districts can offer Montessori-specific professional development and paid Montessori-credential training for teachers. Second, rather than district-wide requirements, school districts can prioritize individualized curriculum, testing, and schedule decisions for each school in the district. Third, school districts can hire building administrators who have Montessori credentials or a strong understanding and commitment to the pedagogy.

Fourth, Montessori teacher-education programs can include advocacy and an understanding of educational policy systems in their teacher-education curricula. Finally, school districts can support Montessori teachers currently working in public schools by listening to their experiences and expertise and including them as part of the decision-making processes.

Regardless of the policy struggles, the Montessori Method is one of the largest global alternative approaches to education, with an estimated 15,763 Montessori schools worldwide (Debs et al., 2022). In addition, the United States is one of the countries with the largest number of government-funded or public Montessori programs. Policymakers, school districts, and school leaders should determine how to keep teachers from being “swept up in a flow of mandates that consume their thinking, their energy, and for some, even their love of teaching” (Valli & Buese, 2007, p. 545). To get there, future research could expand the scope of participants to first understand their level of engagement in policies that shape their Montessori pedagogy in public schools and then explore ways to support them and Montessori education in public schools; this research should be based on the understanding of the educational policy landscape.

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Appendix
Group-Level Assessment Prompts

1. Teachers need administrators who
2. If I could change one thing about standardized testing, it would be
3. I feel most supported in my teaching when
4. We could increase state policymakers' awareness of the Montessori Method by
5. In an ideal world, public schools would
6. I think _____ likely helps Montessori teachers in public schools the most.
7. Our biggest challenge using the Montessori Method in public schools is
8. Advocacy work is
9. To me, commitment to the Montessori pedagogy means
10. A Montessori public school administrator that does not have a Montessori credential is
11. When a new policy or rule is announced at my school, I feel
12. The best thing about teaching in a public school is
13. I am most confident in my teaching when
14. I wish more people knew _____ about Montessori education in public schools.
15. Education policies should be made by



Seeking Racial and Ethnic Parity in Preschool Outcomes: An Exploratory Study of Public Montessori Schools vs. Business-as-Usual Schools

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Keywords: preschool, racial equity, child outcomes

Abstract: Montessori pedagogy is a century-old, whole-school system increasingly used in the public sector. In the United States, public Montessori schools are typically Title I schools that mostly serve children of color. The present secondary, exploratory data analysis examined outcomes of 134 children who entered a lottery for admission to public Montessori schools in the northeastern United States at age 3; half were admitted and enrolled and the rest enrolled at other preschool programs. About half of the children were identified as White, and half were identified as African American, Hispanic, or multiracial. Children were tested in the fall when they enrolled and again in the subsequent three springs (i.e., through the kindergarten year) on a range of measures addressing academic outcomes, executive function, and social cognition. Although the Black, Hispanic, and multiracial group tended to score lower in the beginning of preschool in both conditions, by the end of preschool, the scores of Black, Hispanic, and multiracial students enrolled in Montessori schools were not different from the White children; by contrast, such students in the business-as-usual schools continued to perform less well than White children in academic achievement and social cognition. The study has important limitations that lead us to view these findings as exploratory, but taken together with other findings, the results suggest that Montessori education may create an environment that is more conducive to racial and ethnic parity than other school environments.

Racial inequality in the United States is a significant concern. One manifestation of the racial and ethnic opportunity gap is inequality in educational outcomes based on race in school (Reardon et al., 2019). Such differences are in place even before first grade, and they remain throughout schooling (Henry et al., 2020; Magnuson & Duncan, 2006; Paschall et al., 2018). Furthermore, it seems that schools exacerbate racial differences because the differences in learning rates between Black and Hispanic versus White students expand during the school years and contract in the summers (Haberman, 2010; Kuhfeld et al., 2021). Although U.S. public schools have, since their founding, been regarded as potentially addressing inequality by providing universal opportunities that eliminate prior differences (Mann, 1848/1961), in some ways schools may be engineered to continue inequality (Hammond, 2020); certainly racial inequity persists today, even after decades of efforts at its elimination via the conventional educational system (Jeynes, 2015). It is possible that a different pedagogical approach may address achievement gaps better than conventional pedagogy. Here we ask whether Montessori preschool may address the inequality in educational outcomes based on race at kindergarten better than other business-as-usual preschool programs.

Montessori Education

The Montessori education system has existed for more than 100 years and is now the most common alternative pedagogy (Debs, 2019; Debs et al., 2022), used in at least 600 public schools and at least 3,000 private U.S. schools and serving children from ages 3 to 18 (National Center for Montessori in the Public Sector, 2023; this census undercounts because not all schools provide data). Maria Montessori was a physician who first worked with atypically developing children in Rome and then with children from families with lower incomes. She eventually performed research on all inhabited continents to create a pedagogy she intended would help all children become flourishing, independent adults (Moretti, 2021). She explicitly addressed social inequity in her founding address to her first school (Montessori, 1967), and social reform aimed at supporting poor and disadvantaged people was a primary mission throughout her life (Trabalzini, 2011).

The Montessori system of education involves specific inputs. As laid out in a recent logic model (Culclasure et al., 2019), these inputs include the classroom features of mixed, 3-year age groupings in large classes with high child-to-teacher ratios; 3-hour uninterrupted work

periods during which children may freely choose from a full set of specific, hands-on materials they have been taught to use; and well-trained teachers who carefully prepare and organize the environment for learning, provide small-group or individual instruction, observe all children carefully and assess them formatively, and engage in their own ongoing professional development. Montessori pedagogy emphasizes the classroom environment itself as another teacher; lessons using the Montessori materials in this environment are interconnected and given in a spiraling and successive curriculum (Preschlack, 2023). In addition to learning to carefully and objectively observe so they know how to support children's development, teachers are trained to deeply respect every child, the developmental process, and the interconnectedness of all life (Cossentino, 2009). This deep respect is reflected in a positive emotional climate and frequent and positive peer collaboration in Montessori classrooms (Lillard, 2017; Pottish-Lewis, 2021).

Montessori Pedagogy's Potential Impact on Racial Equity

Some aspects of the Montessori Method of educating children may mitigate racial differences in achievement, whereas other aspects may exacerbate them. One possible mitigator is that Montessori teacher training focuses on each child's individual development and is undergirded by a belief that every child has the potential to flourish in life if properly nurtured. As noted, teachers' attitudes toward all children are meant to undergo a personal transformation during training (Cossentino, 2009; Whitescarver & Cossentino, 2007). Teachers come to believe that all children will develop themselves not because a teacher teaches anything, but because the teacher provides an environment that enables concentration. In Montessori theory, it is children's own concentration—more than the teacher or lessons—that causes development, given a proper learning environment (Montessori, 2012). Once concentration happens, the teacher's job is to stay out of the way and not interfere. Social harmony is claimed to occur naturally within classrooms as the children in the class achieve concentration on their work (Montessori, 2012). In addition, Montessori viewed every child as equal at birth; in an introductory lecture to the last teacher-training course she gave in London in 1947, she said,

No matter to what race they belong, to which part of the world they are born, newborns are all alike

... There is another period when we are all alike and this is the period of childhood. All human beings follow the same laws when it comes to development. It is curious, but no matter whether they are Chinese, Indian, African, or European, children all start talking at the same time . . .
(Montessori, 2012, pp. 4–5)

She lectured to future teachers that every child is a miracle and that teachers must focus on the “greatness of their powers” (Montessori, 2012, p. 6). Teachers are taught to observe (as a scientist observes) every child and to believe that every child is capable of great work (Cossentino, 2006) if teachers create conditions that will further the child’s development. In this way, teachers’ racial bias may be mitigated in Montessori training; they embrace every child as a miracle, and they focus on creating an environment to allow every child-miracle to unfold.

A second way that Montessori pedagogy may mitigate racial disparities in achievement is through its centralizing of self-determination (Lillard, 2019). Children choose what they do all day long (as long as their choices are constructive). If the “pedagogy of poverty” (Haberman, 2010, p. 81) is reinforced by restricting the access of children of color to challenging material in conventional schools, then giving children full access to materials in Montessori schools may free all children to develop to their fullest potential. As a corollary to the impact of self-determination, a teacher’s belief that children may not be capable of doing the work is inert when children choose their own work. By contrast, in conventional schools, teachers’ beliefs in students’ abilities differ by children’s race (Dee & Gershenson, 2017). Furthermore, because the materials are self-correcting, Montessori teachers do not tell a child they are wrong or have not worked carefully enough; children can see such things for themselves. With self-determination at its core, Montessori pedagogy “allows students to flex their cognitive muscles and become independent learners” (Hammond, 2020, p. 152), which is crucial for education equity.

However, there also are two aspects of Montessori education that may work against parity in racial achievement outcomes. One of these is differentiated instruction in the hands of teachers who may remain biased despite their training. Most Montessori teachers are White, whereas most students in public U.S. Montessori schools are children of color (Debs, 2016). If White teachers underestimate the intellectual capabilities

of children of color (Dee & Gershenson, 2017), then they may not give them lessons as readily, thereby impeding some children’s progress in the individualized curriculum because children can use only the materials that they have been shown how to use. If children of color are limited by their teachers’ biases, then the performance of world-majority children in Montessori classrooms could be worse, on average, than the performance of world-majority children in conventional schools, where children typically get large-group lessons with their classmates (Bassok et al., 2016).

Another aspect of Montessori education that may perpetuate inequality is the fact that it was designed by an Italian woman and her collaborators in the first half of the 20th century; many of its lessons may therefore ensconce a Eurocentric viewpoint that may fail to acknowledge alternative views. Although Montessori and Mario Montessori Sr., her son and collaborator, traveled extensively and spent seven years in India during and after World War II (Montessori, 2020), the potential for cultural hierarchy to pervade the curriculum and materials certainly exists. As Hammond (2020) stated, culturally responsive pedagogy “requires teachers to have the most useful analogies, illustrations, examples, and demonstrations that help make the content comprehensible to the student” (p. 157); the century-old Montessori materials and lessons may not speak to children of color.

Existing Research on Racial Outcomes of Montessori Education

Studies on the outcomes of Montessori education for world-majority children are not entirely consistent, and they have limitations. First, we review studies of elementary school-aged students that have shown that Montessori students had significantly better or similar outcomes than peers in comparison schools. One such study focused only on children in magnet schools, comparing the state test scores of Black or African American children in three urban public Montessori schools in North Carolina with those of students in three other magnet schools (Brown & Lewis, 2017). It found higher reading test performance and equal math test performance for students in Montessori schools. However, this study was small and limited to a few magnet schools. A much larger study of children who attended South Carolina public schools used participant matching for demographics and prior test scores and also controlled these factors (Culclasure et al., 2018); it also found a pattern of greater school-year growth in English

language arts (ELA) and social studies scores for Black children enrolled in the state's 23 public Montessori schools as compared with the children in other public South Carolina schools; however, Hispanic children's growth was not significantly different, nor were math or other scores for Black children. Thus, in this tightly controlled study, there was evidence of Montessori schooling benefiting Black children in elementary school in two subjects, but there was no general pattern of better performance for world-majority children.

Snyder et al. (2022) conducted a nationwide study, examining proficiency levels on third-grade and eighth-grade state tests at Montessori schools ($N = 191$ schools) in the 10 U.S. states or regions (i.e., Washington, DC, metropolitan area) with the most public Montessori schools, as compared with proficiency levels of their districts (after removing the Montessori schools' scores). They found that public Montessori school students classified as Hispanic and as African American were, as groups, significantly more proficient on state ELA tests than were children attending all other public schools in their districts. On state math tests and compared with their third-grade counterparts in other district schools, African American children performed better, and Hispanic children performed similarly. In this study, even more than in the two just described, better performance may reflect factors outside of schooling itself because the Montessori schools were likely a parent choice (i.e., involving a special application process), and individual child-level data were unavailable. Snyder et al. (2022) attempted to address the issue of extraneous influences by examining differences in proficiency levels in eighth grade while controlling for proficiency levels in third grade. For Black and Hispanic children, the differences in eighth-grade proficiency levels controlling for third-grade proficiency levels were significantly greater for Montessori schools than for those in the rest of their districts' public schools, in both ELA and math. However, students who remained in Montessori schools until eighth grade may have been students who were particularly likely to thrive there.

These three studies suggest that Montessori pedagogy may reduce racial inequality to some degree during the elementary school years, particularly for Black children. Only one study has examined race and ethnicity in preschool. Ansari and Winsler (2014) compared children enrolled in HighScope programs to those in modified Montessori programs in Miami-Dade County, Florida; the Montessori programs were modified in that they had only one age group. Ansari and Winsler

found that Hispanic children showed more academic development in Montessori programs than in HighScope programs by the end of kindergarten; these advantages held through third grade (Ansari & Winsler, 2020) but were not observed for Black children in the modified Montessori program at either time point. However, given the racial segregation in Miami-Dade County (Ansari & Winsler, 2014), children of different races were living in different neighborhoods and attending different schools. Because Hispanic children in the study were at different Montessori schools from the Black children in the study, it is possible that the different schools' quality undergirded the different results by race. Another possibility relates to cultural differences in parents' communication style. Black parents tend to use more directive language with children (Miller, 1996; Miller & Hoogstra, 1992). Montessori teachers are trained to use respectful language; in White culture, "respectful" can sometimes be interpreted to mean less direct. Because it differs from many Black children's home language, indirect language may be less effective for Black children. By this reasoning, young Black children in Montessori environments may be less apt to thrive, and the fact that older Black children appear to thrive in Montessori programs may suggest that cultural adaptation occurs on the part of the children or their teachers in public elementary schools.

In sum, some suggestions propose that children of color may thrive in Montessori public schools more than in other public schools, but many of these data are at the elementary level. The sole preschool study suggests that Montessori pedagogy may benefit Hispanic children, but in that study, among other issues, the Montessori program was modified.

In fact, fidelity is at issue in all the studies just reviewed; the fidelity of the Montessori programs was either not well documented or was known to include key modifications. Montessori programs vary widely in fidelity (Daoust, 2004; Daoust & Murray, 2018; Murray & Daoust, 2023), and outcomes can vary accordingly (Lillard, 2012; Lillard & Heise, 2016). In the Miami-Dade County study comparing Montessori programs with HighScope programs, for example, the Montessori program lacked the 3-year age grouping required for high-fidelity Montessori pedagogy (Lillard & McHugh, 2019a); instead, each classroom included only 4 year olds. In the South Carolina study by Culclasure et al. (2018), fidelity in some schools was rated low on a rubric that was designed for the study. A second problem, also noted previously, is that public Montessori schools are typically

choice schools (Culclasure et al., 2018), meaning that parents have chosen Montessori schools among an array of options. Although Brown and Lewis (2017) did compare Montessori schools with other choice (i.e., magnet) schools, we cannot know if characteristics of parents who choose public Montessori schools differ in ways that may directly cause different outcomes. In the South Carolina study (Culclasure et al., 2018), this concern is mitigated but not eliminated by examining year-over-year gains. Thus, the claimed Montessori effect in all of these studies may be an effect of parents who choose Montessori schools, rather than an effect of the pedagogy.

The Current Study

The study described here addresses problems in prior studies with secondary analysis of data from an existing study (Lillard et al., 2017). In this study, the participants were children in high-fidelity Montessori schools who had been admitted by a lottery. The lottery-admission criterion addresses the issue of possible differences in the children being created by differences in parents who choose Montessori schools for their children. This is because the parents of children in the control group (i.e., those who had not been selected in the lottery) had also made the choice for their children to attend the same Montessori schools. In the Lillard et al. (2017) study, children in Montessori schools performed better over time on early academic measures as well as on a test of social cognition, they were more likely to persist in the face of challenge, and they performed somewhat better on tests of executive function at age 4. Lower-income children were particularly affected—positively so—by Montessori education.

Initial results from the prior study did not address race because “the income achievement gap, which is larger than the racial achievement gap, is present by kindergarten, and persists at that high level throughout school” (Lillard et al., 2017, p. 4; Reardon, 2011). This failure to consider race as an independent variable reflected a view that the root of racial disparities in achievement is income disparities that coincide with race (Magnuson & Duncan, 2006).

The present secondary analyses focus on race because race itself is also an important factor in differences in achievement (Burchinal et al., 2002; Reardon, 2016). The most pertinent analyses, given national concern about racial differences in educational outcomes, address whether inequality in educational outcomes based on race exist in Montessori schools to the same degree as

in control schools (i.e., the schools children attended when they were not selected by lottery placement in the Montessori schools). In the original study, the participating children were identified by a parent or guardian as African American, Asian, White, Hispanic, multiracial, or other. African American, Hispanic, and multiracial peoples are historically marginalized in the United States, and thus were the groups of most interest in a study addressing inequality in educational outcomes based on race, such as the present study. Although these groups have very different histories in the United States, no single group was sufficiently numerous for reliable analysis as a separate group, so they were combined. Children identified as Asian were not included in the current study because our analyses focused on groups that have historically faced structural inequity and obtained lower performance scores in school (Reardon et al., 2019). In addition, we omitted one child from the study whose parents declined to identify any ethnicity. Because our numbers were still small even when the groups were combined, we consider our analyses to be merely exploratory.

The study focus is academic achievement by race; the current study also examines executive function and theory of mind, which are predictive of academic achievement (Blair & Razza, 2007; Robson et al., 2020). The three outcomes that will be examined are discussed next in the context of existing literature regarding race.

Academic Achievement

As noted, several studies have found inequality in educational outcomes based on race, which is widely considered an opportunity gap (Reardon, 2011, 2016; Reardon et al., 2019). This gap may be caused by schools in which Black, Hispanic, and multiracial children are enrolled offering fewer opportunities (e.g., reading specialists or good library collections) or by fewer opportunities being afforded to Black, Hispanic, and multiracial children than White children within the same schools. At issue is whether the differences in educational outcomes based on race for Black, Hispanic, and multiracial versus White children in Montessori preschools are the same size as the difference seen in children in control preschools.

Executive Function

Executive function refers to the prefrontal processes that allow us to make plans, inhibit one behavior in preference for another, and hold and manipulate information in our minds (Miyake et al., 2000). Several

studies have suggested that executive function in young African American children may sometimes be less developed than in White children (e.g., Blair et al., 2011; Little, 2017); differences in academic achievement may be related to differences in executive function (Nesbitt et al., 2013) because self-regulation predicts academic achievement (Robson et al., 2020). Although reasons for delays in executive function in children of color are unclear, one suggestion is that higher levels of family stress associated with racism interfere with prefrontal development (Hackman & Farah, 2009).

Theory of Mind

Theory of mind refers to a key aspect of social understanding, specifically appreciating that others have mental states that reflect how they construe the world and that drive their behavior. Along with being related to social competence (Wellman, 2011), theory of mind predicts academic achievement (Blair & Razza, 2007; Lecce et al., 2017). Several important developments in theory of mind occur in the preschool years, when children first understand that people may have divergent desires and perceptions and, later, that people can have divergent beliefs. There is a dearth of information about the performance of different racial and ethnic groups in the United States on theory of mind tests; most studies have used majority-White samples and had insufficient subgroup numbers to examine outcomes by race or ethnicity (e.g., Weimer & Guajardo, 2013). However, three studies did provide data on the performance of different racial and ethnic groups in the United States on theory of mind tests. Curenton (2003) tested a sample of African American and European American children enrolled in Head Start programs. Controlling for language proficiency, Curenton found lower performance on the contents version of the false belief test among African American children than White children. In a contents false belief test, crayons are placed in a Band-Aid box and children are asked what a naive person (i.e., someone who had never seen inside the box) would think was in the box—in other words its contents. Curenton found no racial differences in performance on two other standard theory of mind tests. The contents false belief finding replicated a previous study in which a mainly African American sample performed less well on the contents false belief test than is typical for predominantly White samples (Holmes et al., 1996). A more recent study using a full five-part Theory of Mind scale (Wellman & Liu, 2004), with a sample described as predominantly children of color, found they passed all tasks on the scale

at an older age on average relative to other studies with predominantly White samples (Baker et al., 2021). In sum, although few theory of mind studies have addressed race in a U.S. context, those that have suggest that the development of theory of mind in children of color may occur somewhat later, at least on specific tests, than in White children; here, we ask whether there is parity in this development for children of different races who attend Montessori schools.

In sum, the goal of the present study was to analyze an existing dataset to determine whether high-fidelity Montessori preschool environments are places of greater racial parity than business-as-usual preschools for academic achievement, executive function, and theory of mind development.

Method

Participants

Participants were 134 children with an average age of 41.16 months; $SD = 3.30$, range = 33.8–48.7 at their first testing point in the fall of their first year of prekindergarten (PK3, or prekindergarten at age 3 years) (See Table 1). Seventy-two children were male and 62 were female; 53 children were identified by their parents or guardians as White and 81 as either African American ($n = 23$), Hispanic ($n = 27$), or multiracial ($n = 31$). Of the nine multiracial participants whose parents specified what “multiracial” meant, six children were Hispanic/Latino and White, two were African American and White, and one was African American and Hispanic. The average household income in the full sample was \$70,022 ($SD = \$45,550$; range = \$0–\$200,000). Average maternal education included some college (6.67, $SD = 1.2$, range = 2–8; where 2 = ninth grade, 5 = high school diploma, 8 = graduate school; see Appendix).

Lottery and Control-Group Schools

The children’s parents or guardians had entered them in a lottery to enter the PK3 program at one of two high-fidelity urban public Montessori schools in the northeastern United States in one of the 4 years spanning 2010–2013. The fidelity of the schools was indicated by their being recognized by Association Montessori Internationale of the United States (i.e., AMI/USA), the American branch of the association Maria Montessori founded in 1929 with the aim of maintaining and developing her pedagogy. AMI/USA has a formal recognition program for schools that have AMI-trained teachers and that apply the pedagogy according to specific

Table 1

Average and Standard Deviation of Age, Household Income, and Maternal Education and Numbers of Each Race by School Type

Variable	Montessori group (SD)	Control group (SD)
Age at fall test in months	41.45 (3.21)	40.87 (3.38)
Household income	\$72,795 (41,553)	\$67,165 (49,490)
Maternal education	6.72 (1.31)	6.62 (1.11)
Race (<i>n</i>):		
White	33	20
Hispanic	11	16
Black	12	11
Multiracial	12	19

Note. For maternal education, 2 = ninth grade, 5 = high school diploma, and 8 = graduate school.

standards. The lottery was random except for sibling and staff preferences and preferences for children who live in the neighborhood; no staff children were included in the study, and only two siblings were. Omitting the siblings (i.e., students whose families had been enrolled through previous years' lotteries) did not affect results. There was also one crossover (i.e., noncomplier) child in the control group who had been admitted to one of the two Montessori schools but did not attend. Excluding this child also did not change results. The fact that both of the schools were magnet schools and thus were in low-income neighborhoods but admitted a fixed percentage of children from outside of the neighborhood means that, ideally, our study enrollment could have incorporated the information about what lottery categories (or blocks) the children were in. Unfortunately, when the study was conducted, no information was available regarding neighborhood-preference lottery blocks; this threat to validity is discussed further in the Limitations section.

All children's parents had specified one of two Montessori schools as their first choice. Among the lottery-waitlisted children, only those who went to another type of school (i.e., not another Montessori school) were included in the study; thus, the study used a treatment-on-the-treated design.

Control Schools

The control participants were in 51 different schools when they were 3 years old, including other magnet schools (e.g., a Reggio magnet school, a science specialty school), childcare centers such as Bright Beginnings, and cooperative schools. Thirty-one control children were in urban schools, and 35 were in suburban schools. Twenty-two control children were in public schools, and 14 of these were in a public magnet school. Thirty-

seven children were in private schools or day-care centers (roughly half urban, half suburban), and seven were in urban Head Start programs. At the time of the study, all public early childhood programs in the state in which the study took place were required to satisfy National Association for the Education of Young Children (NAEYC) accreditation standards and be a member of the state's early childhood professional registry. This state also required an early childhood teaching credential that entailed either (a) being a graduate of an approved (public state) higher education program or teaching experience or (b) a degree from an unapproved institution and 12 credits in early childhood education. No further information on the control children's schools is available.

Measures

Measures used in the study addressed children's early academic achievement, executive function, and theory of mind.

Academic Achievement

Academic achievement was measured with four Woodcock-Johnson IIIIR subtests (McGrew & Woodcock, 2001): Picture Vocabulary, Letter Word, Applied Problems, and Calculation. These tests are widely used in the field and have been normed on nationally representative samples of children ages 4 and older. Some Letter Word test stimuli were modified to reflect that Montessori classrooms teach cursive letters: The early items in which children identify letters were overlaid with cursive letters for the Montessori participants. The Calculation subtest was administered only to children who reached item 19 on the Applied Problems test. The Applied Problems and Calculation raw scores were

summed to create a math score. In the original study, the Math, Letter Word, and Picture Vocabulary scores loaded on a common factor and were highly correlated ($r > .80$); to reduce the number of comparisons, these scores were combined (by adding z scores) for an overall academic achievement score for each child (for another prominent study using such a strategy, see Lipsey et al., 2017).

Executive Function

Two tests measured executive function: Head-Toes-Knees-Shoulders, or HTKS (Ponitz et al., 2009), and Design Copy (Korkman et al., 2007). HTKS is an opposites game in which children have to touch the opposite of a specified location; the experimenter explains the test (“When I say touch your toes, I want you to touch your head”) and then gives a series of commands. Children are given 2 points for immediately touching the opposite location, 1 point for starting to touch the wrong location and then switching to the right location, and 0 points if they touch the designated location (e.g., touch their head when told to touch their head). Children who do well on the Head-Toes portion have Knees and Shoulders added to the command set. There are 10 commands in each section, so the possible scores range from 0 to 40.

Design Copy is a subtest from the Visuospatial Processing section of the neuropsychological assessment NEPSY-II; it was administered and scored in the standard manner (Korkman et al., 2007). Children were shown a 4 x 4 grid with geometric or other shapes in each box of the top row and the third row. The first box had a vertical line; the experimenter showed children how to copy the line in the box below it, saying, for 3- and 4-year-olds, “See this line? I will draw one here.” The experimenter then pointed to the second figure and the second box in the second row and said, “Now you draw one here,” pointing to the second figure (i.e., a horizontal line) and the box below it. When children were in kindergarten, and for the remaining items, the experimenter simply pointed to the top figure and then the box below, saying, “Copy this one here.”

This sequence continued until a child failed to copy three consecutive figures, or for 16 items. Raw scores ranged from 0 to 16. An independent coder coded a randomly selected subset of children at each test period, and interrater reliabilities across the two coders were excellent: $r = .98$ (28 children at Time 1), $r = .97$ (23 children at Time 2), $r = .95$ (15 children at Time 3), and $r = .91$ (21 children at Time 4). To reduce the number

of comparisons, the scores on HTKS and Design Copy were converted to z scores and summed for an executive function score. A second rationale for combining the two scores is that single measures of executive function are less reliable than composite measures created from more than one test (Willoughby et al., 2011).

Theory of Mind

Theory of mind was measured using the Theory of Mind scale (Wellman & Liu, 2004). The scale has good psychometric properties (Beaudoin et al., 2020; see their Supplementary Table 2). Four consecutive tests from the scale were used; children’s scores on each of the four theory of mind tests were summed for the scale score and also examined separately.

Each short vignette in this scale measures an aspect of understanding others’ minds and is presented either with small dolls and other objects or with pictures. For the test entitled Diverse Beliefs, children were shown a doll and pictures of different locations and then asked where they thought an object was (e.g., the doll’s cat)—in the bushes or in the garage. After children responded, they were told the doll thought her cat was in the other location; children were then asked where the doll would look for her cat. The correct answer was where the doll (not the child) thought it was.

For the test assessing children’s understanding of knowledge access, children were shown a doll and a doll-sized cupboard and then were asked what was inside the cupboard. The children were then shown the contents of the cupboard (e.g., a ladybug) and were asked what the doll, who had never seen inside the cupboard, would think was inside.

For the contents false belief test (described earlier), children were shown a standard box (e.g., a Band-Aid box) and, after the children agreed that they thought the box would contain Band-Aids, they were shown that it actually contained crayons. The children were then asked what a doll who had never seen inside the box would think was in it.

Only children who passed the contents false belief test by saying that a person would think the Band-Aid box contained Band-Aids were given the final theory of mind test, the appearance reality emotion test. For this test, participating children were given a scenario in which a child received a disappointing gift. To pass the test, participating children had to report that the child who received a disappointing gift would pretend to be happy in front of the giver while feeling sad inside. This test is given

only to children who successfully complete the false belief test because it is highly unusual for a child who has been unsuccessful on the false belief test to pass the appearance reality emotion test (Wellman, 2014). Because there is a maximum of four tests, each of which is either passed (for a score of 1) or failed (for a score of 0), Theory of Mind scale scores in this study range from 0 to 4.

Procedure

Children were tested individually by trained experimenters on the battery of measures on each of four occasions: in the fall soon after they matriculated (September–December), approximately six months later, and then approximately 12 and 24 months after that. Most children were tested in their school or day care; some were tested in a local library. All children were tested in English. The study methods are described in more detail in Lillard et al. (2017).

Power

Given the sample sizes here, using Cohen's d , a power of .8, and the standard alpha of .05, the minimum Cohen's d is 0.69 for the Montessori group and 0.76 for the control group. These effects are quite large for field research in schools (Kraft, 2020), so our study is underpowered; this is a second reason why we consider the study to be only exploratory.

Analytic Approach

The research question addressed in this analysis was whether racial disparities that exist in business-as-usual preschools also exist in Montessori preschools. We first examined whether socioeconomic status, the education of the mother and father, and racial and gender balances differed across Montessori and control groups. Next, to address the primary research questions regarding whether racial disparity is less apparent in Montessori programs, the data file was split between Montessori and control groups. We conducted two longitudinal latent growth curve analyses on each variable, the first to determine whether the slope of change across the preschool years differed for White versus Black, Hispanic, and multiracial children in Montessori schools and the second to determine whether the slope of change differed for children in these groups in the control schools. These analyses were followed by simple t tests examining whether there were racial group differences at any time point for the focal variables within each school group. Differences at single time points were deemed less

interesting than patterns of difference; hence, we report results reflecting clear directional patterns. Analyses were performed via Mplus (Version 8.4) and R software (Version 4.2).

Results

The Montessori and control groups were not significantly different in terms of racial or gender category (as determined by chi-square tests), nor did they differ in age, household income, or mother's highest level of education at baseline (using t tests). Although not significantly different, the racial composition was not identical (possibly suggesting some compromise in the random assignment, due either to not taking neighborhood preferences into account or to differentials in the choice to participate in the study by condition). For this reason, race was accounted for in the analyses. Because our samples were small and therefore more prone to spurious effects, we also controlled for gender and maternal education (which is highly related to income) in analyses where possible.

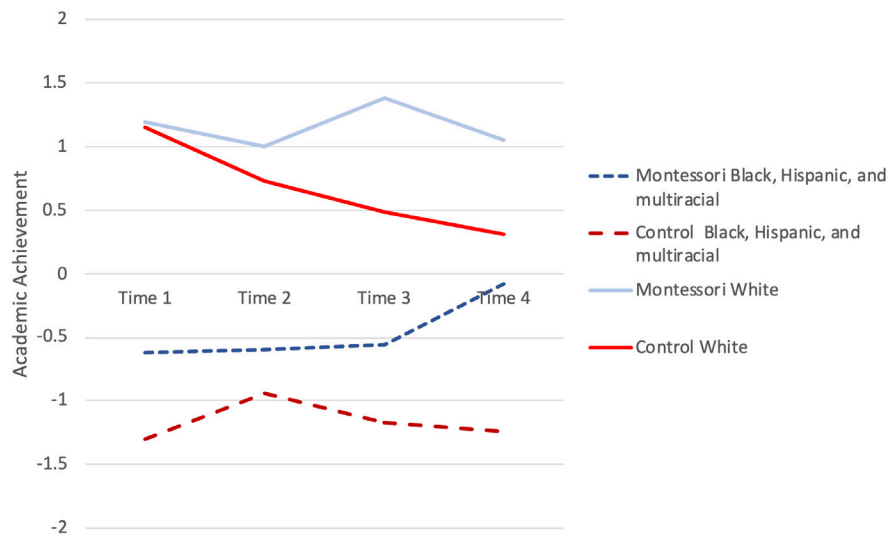
Children were not clustered in classrooms (as they would be had we used hierarchical modeling) because (a) for the control children, typically only one child was in a classroom (indeed, only one child was typically in each control *school*) and therefore there were no clusters; and (b) for the treatment children, the classroom composition changed markedly each year as 33% of the children were replaced by a new set of children. There also was teacher and assistant turnover in the 11 classrooms involved in the study. Because of this instability, it did not make sense to us to cluster sets of children within Montessori classrooms.

There was sample attrition during the study: From the first test point to the fourth test point, the Montessori group decreased from 68 children to 57, and the control group decreased from 66 children to 61. The primary cause of attrition was parents moving out of the area; because moving out of the area is (in study terms) a random event (rather than caused by a systematic variable related to Montessori education), the missing data were viewed as missing at random. Missing data were managed using full information maximum likelihood estimation.

Academic Achievement

Latent growth curve analyses were performed on data from each school group, controlling for baseline score (Time 1) at the intercept and for baseline score,

Figure 1
Academic Achievement z Scores Across Time by School Type and Racial Group



gender, and maternal education when examining the slope. Details are provided in the Appendix.¹ For both groups, as expected, test point affected the intercept in that Black, Hispanic, and multiracial children’s academic achievement was lower when they first began school. Thereafter, for children in Montessori schools (i.e., the treatment group), test point was not significantly related to the slope of academic achievement. However, it was in the control group, with a beta of -0.243 ($p = .026$).

This pattern in academic achievement was reiterated using t tests. Significant differences in White versus Black, Hispanic, and multiracial children in the control group were seen at all four test points. In the treatment (i.e., Montessori school) group, significant differences between White versus Black, Hispanic, and multiracial children were present at the first three test points, but the difference was not significant by the end of kindergarten.

¹ Although the sample size is relatively small for growth curve analyses, children were randomly assigned to the Montessori group or the control group. Remedies (e.g., controlling for covariates) were also undertaken to strengthen the statistical conclusion validity. Although Bayesian methods in conjunction with informative priors perform better with small sample sizes, they may produce incorrect conclusions when the prior information is incorrect (Shi & Tong, 2017). For our analysis, we tried Bayesian methods with noninformative priors; the results were the same as our current results. It is difficult to find informative priors and check whether they are accurate. Because Bayesian methods are less familiar to most researchers, we did not report the results from the Bayesian approach.

This pattern is shown in Figure 1, in which the lines of the Montessori group begin to close from the 4-year-old prekindergarten (PK4) year to the kindergarten year (i.e., the third to the fourth test point), with the Black, Hispanic, and multiracial children’s z scores improving for treatment children, whereas the control children’s lines remained separate and did not improve relative to the sample. In fact, the achievement z scores of the Montessori Black, Hispanic, and multiracial group approached those of the control group’s White children by the spring of the kindergarten year.

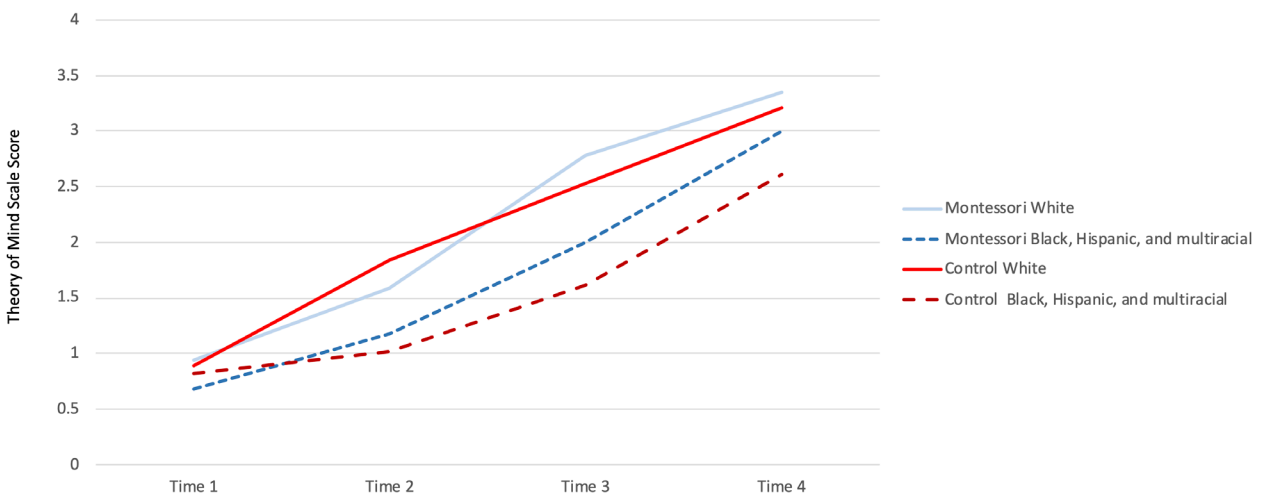
Theory of Mind

The same latent growth curve analysis was performed on the total Theory of Mind scale score and revealed no racial differences in the slope of theory of mind development in either the Montessori group or the control group. Details are provided in the Appendix. Although the latent growth curves were not significant, model fit was not ideal. Using an alternative analytic method, t tests showed significant racial group differences at all spring test points in the control group: White children in the control group scored higher than Black, Hispanic, and multiracial children at each spring test point. No pattern of racial difference was observed in the Montessori group, as Figure 2 shows.

Because prior research had shown racial differences particularly on one test (i.e., contents false belief), we ran Mann-Whitney U tests (appropriate for 0–1 data) to examine possible racial differences at each test point

Figure 2

Theory of Mind Scale Scores Across Time by School Type and Racial Group



for each test on the scale. In the control group, White children were more apt than Black, Hispanic, and multiracial children to answer correctly on the false belief test in the spring of both their PK3 and their PK4 years, or Times 2 and 3 ($U = 290.0, 260.0; p < .001, p = .001$, respectively), as well as the knowledge access test at those same time points ($U = 267.5, 312.0; p = .002, .024$, respectively). The hardest test on the scale, the appearance reality emotion test, also trended to difference at the end of the kindergarten for children in the control group ($U = 109.5, p = .076$). By contrast, for children in the Montessori group, the knowledge access test showed a racial group difference when they first started school (Time 1): $U = 404.0, p = .016$. The significance of that difference was reduced by the end of PK3 (Time 2) in the Montessori group ($U = 412.0, p = .051$); thereafter (Times 3 and 4), the difference in the knowledge access test scores of White children versus Black, Hispanic, and multiracial children was not significant in the Montessori group.

Executive Function

The same latent growth curve analysis was performed on the executive function composite and revealed no differences in racial group performance in either type of school. Again, details are provided in the Appendix. For executive function, t tests at each time point also showed no patterns of differences.

Discussion

Education in the United States has long been viewed as a mechanism that may level economic outcomes by providing opportunities to all children. Current assertions and developing mainstream understandings of how implicit bias can affect opportunities in schools run counter to this long-held view (Hammond, 2020). The present exploratory secondary data analyses add to a body of existing research that suggests Montessori education may be a mechanism for creating more equal outcomes for Black, Hispanic, and multiracial children.

The first finding is related to racial differences in academic achievement. In both samples, when children began school at age 3, there were differences by race, with Black, Hispanic, and multiracial children scoring lower than White children. These differences remained throughout preschool for Black, Hispanic, and multiracial children in the control group; for Black, Hispanic, and multiracial children in Montessori classrooms, scores were similar by the end of preschool, and the racial difference in academic achievement was no longer significant. This finding is consistent with existing literature that showed smaller racial test score gaps for children in Montessori programs compared with other school programs (Brown & Lewis, 2017; Culclasure et al., 2018; Snyder et al., 2022), as well as better performance among Hispanic children in modified Montessori programs versus HighScope programs (Ansari & Winsler,

2020). This finding is also consistent with qualitative research reporting on interviews with adults ages 25 to 40 who attended a predominantly Black Montessori preschool as young children. Although there was no control group in this mixed-methods study, these adults were highly successful: 92% had an undergraduate degree (compared with less than 40% of Americans in general), and 25% also had postgraduate degrees (Lillard et al., in press).

There are limitations in all of these studies, but if the results are valid and reliable, what might be responsible for the finding that gaps in performance of different racial groups remained steady across preschool for the control group but lessened over time for children attending public Montessori schools? Because all parents of the children in the present study had selected a Montessori school for their child, it seems unlikely that the findings in this study can be attributed to preexisting differences in Montessori parents versus control parents (cf. Todd & Wolpin, 2007). Another possibility is that different schools have different resources. Children in the Montessori group were at the same two public schools, distributed across 11 Montessori preschool classrooms. By contrast, children in the control group were at 51 different schools at the start of the study. It is possible that Black, Hispanic, and multiracial children who were not admitted to Montessori schools attended lower-quality schools than did White children who were not admitted to Montessori schools and that those lower-quality schools then exacerbated differences over time.

Unfortunately, little information about the schools attended by control children was collected, but it is possible that different schools contributed to the different levels of performance seen in the present study. Although some research has found that school inputs have little effect after family inputs are accounted for (e.g., Todd & Wolpin, 2007), certainly preschool quality is known to have effects (Yoshikawa et al., 2013). However, studies that use hierarchical linear modeling to control features at the classroom level (where resources or classroom quality are the same) still find inequality in educational outcomes based on race (Quinn & Cooc, 2015). Finally, even within the same conventional schools, although differences in levels of performance by race decrease somewhat, there are still differences (Singham, 2003). High-quality preschool does reduce inequality in educational outcomes based on race (Friedman-Krauss et al., 2016). The quality of the public control schools in the present study was likely similar to that of the public Montessori

schools in several respects, in that public early childhood programs in the study state were required to satisfy NAEYC accreditation standards and to be members of the state's professional registry; teachers also were required to have specific credentials. The private control schools may explain the difference, in that perhaps White children in the control group were more likely to attend high-quality private schools than were Black, Hispanic, and multiracial children in the control group; on average, however, private and public school attendance does not render different achievement outcomes (Pianta & Ansari, 2018). In sum, it is possible that lower quality in schools attended by Black, Hispanic, and multiracial children in the control group explains our findings, but there are reasons to think this is not the full explanation. A meta-analysis of the inequality in educational outcomes based on race showed that curriculum can reduce the gap (Jeynes, 2015), and it is possible that Montessori pedagogy is one such curriculum.

Thus, we next consider the possibility that the difference in educational outcomes based on race across Montessori schools and control schools stems from features of Montessori pedagogy not present in most control preschool programs. Most preschool programs are teacher driven, not learner centered (Bassok et al., 2016). We know from many years of research that teacher expectations can be a significant predictor of student learning in conventional school environments (Good et al., 2018). In contrast to conventional teachers (Dee & Gershenson, 2017), Montessori teachers may be less likely to hold lower expectations for global majority children, although we know of no research that supports that conjecture. However, it is possible that, even if the expectations of Montessori teachers and non-Montessori teachers were equally biased, those biases may have less influence on student outcomes in the Montessori system, for reasons discussed in the Introduction. For example, this failure to negatively influence children could be caused by the different ways teachers interact with children and give feedback in each system. Montessori pedagogy offers a prepared environment that supports agency or learner autonomy (Montessori, 2012). In Montessori programs, children are given initial lessons with materials, but thereafter they learn from using the materials. The teacher's role is to make that initial connection, but children then seek to master the materials on their own. Corroborating the possibility that teacher bias has less impact in Montessori classrooms because teachers interact with children differently there, in the

Lillard (in press) interview study referred to previously, one alumnus said,

The Montessori environment let me know that I could identify what it is that I'm interested in, capitalize on those things, learn those materials, perfect those materials at my own pace, and then move forward on to the next project because that's where Montessori [school] always was. (p. 16)

Another former student said,

Not only did [Montessori schooling] give me autonomy over what I was learning about, and the pace at which I learned, but it also in turn allowed me to feel mastery of it . . . We were self-led. We had to figure it out for ourselves. I mean, we were given a lesson, but then we were sent off to get to work and I think that is just . . . that is so important. . . . [The teacher] was always available for help and we were encouraged to ask questions and get help, but at the end of the day it was on us, we were the ones who were taking charge of our own learning and we had to engage with whatever it was in the classroom that was at our level at that time. (Lillard et al., in press, pp. 16–17)

In sum, perhaps Black, Hispanic, and multiracial children close outcome gaps over time in Montessori environments because teachers do not inadvertently provide feedback in ways that reinforce those gaps. One reason they may not provide such feedback is because Montessori pedagogy entails self-directed learning with a set of hands-on materials designed to teach, rather than learning that is achieved through teacher interaction with students. In this way, Montessori pedagogy shrinks achievement gaps because it frees children to capitalize on their own capabilities.

There is a third possibility that Montessori education closes achievement gaps more than business-as-usual schools do: Teacher-child relationships, in theory, may be stronger in Montessori settings than in non-Montessori settings, in part because of the one-on-one instruction that attends to a child's specific learning needs. Other researchers have shown that stronger teacher-child relationships predict, in particular, reading achievement for African American preschoolers (Burchinal et al., 2002). Although we know of no studies examining the strength of teacher-child relationships in Montessori

education, it is the case that Montessori children are typically with the same teacher for 3 years (rather than the typical 1 year in most schools), providing an opportunity for stronger bonds. In addition, Montessori teachers are counseled to behave toward children in ways that may foster strong relationships (Lillard, 2017); for example, misbehaving children are not punished with a time-out but are instead asked to stay very close to the teacher until they learn to control themselves. Montessori teachers are also counseled to be warm and sensitively responsive (Lillard & McHugh, 2019b); such interactions are associated with stronger school-readiness skills (Pianta et al., 2020).

Differences in theory of mind for different racial and ethnic groups were not seen in the latent growth curve analyses, which admittedly were underpowered, but differences were seen both overall and on two of the subtests that comprise the overall Theory of Mind scale score (i.e., the knowledge acquisition and false belief tests). What may account for these differences? One possibility is that the 3-year age groupings in Montessori classrooms, which provide opportunities for learning about others' minds, are not achieved as often in the programs in control schools because many of those classrooms were likely single age or had at most 2-year groupings (e.g., Foster et al., 2020). Supporting this possibility, a Chinese study (Wang & Su, 2009) found that only children (i.e., children with no siblings) had more advanced understanding of false belief when they were in preschool classrooms with 2-year age spans than when they were in classrooms with children who were all the same age. Considering family contexts, children who have one or more siblings who are close to the child's own age, and with whom they can interact, have a more advanced theory of mind than children whose siblings are much older or younger or than children who lack siblings (McAlister & Peterson, 2013). The ability to interact with other children who are not of the same age (but are not too much older or younger) may proffer opportunities to develop social understanding among all children (Lillard & Eisen, 2017). According to one hypothesis, then, the racial differences in theory of mind disappear in Montessori schools because all children have social experiences in the classroom that spur theory of mind development.

Another possibility for why racial differences are mitigated in Montessori schools is related to the didactic apparatus itself and to the specific understandings tested in the Theory of Mind scale. In Montessori classrooms,

there are many *Sensorial activities*, which include activities meant to educate the senses of touch, smell, and hearing. When one engages in these activities, one sometimes wears a blindfold to accentuate the sense. Another standard exercise uses the Mystery Bag (or stereognostic bag), which is a bag full of little objects into which children insert their hand to feel for the correct object. For the Theory of Mind scale's knowledge access test, children know what is inside a cupboard (or drawer, etc.) but have to acknowledge that a doll who had not seen inside the cupboard would not know its contents. At school entry, there was a racial performance difference on this test in the Montessori sample, but that difference disappeared by the PK4 year. By contrast, there was no initial difference in successfully completing this test among the control sample, but there was at the later test points. It is conceivable that Montessori children's experience with Sensorial exercises, blindfolds, and the Mystery Bag helped their understanding of knowledge access. Theories concerning how a theory of mind develops in children maintain that the component understanding (e.g., knowledge access, contents false belief) are hierarchical, such that each understanding builds on the previous ones. Thus, children who understand perceptual access early also develop false belief understanding early, and then appearance reality emotion understanding early as well (Wellman, 2014). Thus, two possibilities for the different performance patterns on the theory of mind tests are that the differences stem from children interacting with peers of slightly different ages in Montessori classrooms or from specific Montessori didactic materials that help them learn about minds, or both.

Limitations

Although our findings are consistent with some other literature (e.g., Brown & Lewis, 2017; Culclasure et al., 2018), we view them as preliminary for several reasons. First, we did not have access to lottery information that enabled us to determine whether a child was admitted because they had preference due to residing in the neighborhood. We understood that both lotteries (in neighborhood and out) were competitive. Using lottery-waitlisted children as one's control group equalizes the treatment and control groups in one important way: All children in the study have a parent who entered them in a lottery to attend a Montessori school and thus are equal on any characteristics that go along with that. Nevertheless, we ideally could have also had information

about who was admitted because of neighborhood preference and considered those children as a separate lottery pool as further basis for equalizing the treatment and control groups. Although racial representation was not significantly different within our small sample, across our groups it was not even: White children were overrepresented in the Montessori sample. Although we controlled for this difference in analyses, it is a reason for caution regarding the results.

Another limitation is that we know little about the alternative programs in which the control children were enrolled. Ideally, we would have had more information about the control children's experiences. It is possible that, in the control sample, the Black, Hispanic, and multiracial children attended lower-quality preschools than did White children; if so, that may explain the different patterns of performance observed in the present study. Further research should examine features of the control schools. However, we do know something about those features because all public prekindergarten programs in the test state must comply with NAEYC standards, as well as specific training standards, and there are reasons to think the Montessori curriculum itself may be responsible for the different patterns of performance seen in the present study.

Another limitation is that all children in this study participated in a lottery to enter a high-quality preschool program. It is unclear whether the results found in the present study would apply to children whose parents or guardians did not enter them in such a lottery.

Another limitation is that children of different ethnic backgrounds were grouped together to create sufficient sample sizes. The life experiences of African American children and Hispanic children and their families are different, and, although this grouping was necessary for analysis, further work using larger samples should examine separate outcomes for different racial groups. Another limitation of the small sample, besides not having sufficient representation to examine each race separately, is that, particularly for the control group, the model fit for theory of mind and executive function was less than ideal, making the results less reliable. However, differences in theory of mind were also revealed by *t* tests.

Finally, both of the Montessori schools in this study were recognized by AMI/USA for their high level of fidelity at the time of the study. Therefore, they adhered to strict implementation criteria, which included that all teachers were trained by AMI and that all teachers had Montessori materials. It does not necessarily mean that

every teacher implemented the Montessori program with fidelity, but it is a fairly good indicator of fidelity. Many schools call themselves Montessori schools but do not adhere to Montessori's pedagogy at a high level of fidelity. We do not know whether the results found here generalize to other Montessori schools or even to these study schools at another time.

Conclusion

The study found that, while children in the control group showed gaps in academic outcomes and theory of mind by race, consistent with the existing literature, children who had won the lottery to enter high-quality Montessori preschools did not show such gaps by the end of preschool (although they did show gaps initially). Although it is possible that these results stem from children in the control group attending different schools, the results may also be caused by features of the Montessori system, including self-directed learning, mixed-age groups, and specific didactic exercises. Limitations in the design of this study—including not having complete information about lotteries, a small sample, and uneven racial representation—temper the strength of our conclusions, and we hope the findings will spur further research into the possibility that Montessori education may help close racial opportunity gaps.

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Appendix

Descriptive Statistics

Variables	Montessori group			Control group		
	%		Missingness (%)	%		Missingness (%)
Race White	51		0	70		0
Gender male	54		0	53		0
	<i>M</i>	<i>SD</i>	Missingness (%)	<i>M</i>	<i>SD</i>	Missingness (%)
Mother's highest level of education	7.28	4.16	0	6.72	4.95	0
AA1	0.27	2.32	1	-0.34	2.28	2
AA2	0.20	2.34	1	-0.31	2.19	5
AA3	0.43	2.57	1	-0.56	1.82	2
AA4	0.45	2.29	16	-0.65	2.15	8
ToM1	0.81	0.87	1	0.86	0.70	2
ToM2	1.38	0.94	3	1.27	0.90	3
ToM3	2.37	1.14	1	1.88	1.11	2
ToM4	3.16	1.07	18	2.80	1.09	9
EF1	0.10	1.47	4	-0.17	1.33	8
EF2	0.17	1.63	4	-0.23	1.41	6
EF3	0.26	1.63	6	-0.29	1.37	8
EF4	0.23	1.35	16	-0.30	1.85	8

Note. Mother's highest level of education: 1 = eighth grade or less, 2 = ninth grade, 3 = tenth grade, 4 = eleventh grade, 5 = high school, 6 = some college, 7 = 4 years of college, 8 = graduate school; AA = Academic Achievement at Times 1, 2, 3, and 4, respectively (composite of *z* scores); ToM = Theory of Mind scale score at Times 1, 2, 3, and 4, respectively (range from 0 to 4); EF = executive function composite score at Times 1, 2, 3, and 4, respectively (composite of *z* scores).

Latent Growth Curve Model—Academic Achievement (AA)

Parameters	Montessori group			Control group		
	Estimate	<i>SE</i>	<i>p</i> value	Estimate	<i>SE</i>	<i>p</i> value
Intercept						
Race	1.799	0.510	0.000	2.187	0.455	0.000
Slope						
Race	-0.156	0.094	0.095	-0.243	0.109	0.026
Gender	-0.091	0.085	0.281	-0.151	0.085	0.076
Income	0.005	0.011	0.662	0.015	0.009	0.106

Note. Montessori group CFI = 1.0; TLI = 1.0; control group CFI = 0.99; TLI = 0.98.

Latent Growth Curve Model—Theory of Mind (ToM)

Parameters	Montessori group			Control group		
	Estimate	<i>SE</i>	<i>p</i> value	Estimate	<i>SE</i>	<i>p</i> value
Intercept						
Race	0.320	0.182	0.079	0.332	0.231	0.150
Slope						
Race	0.049	0.052	0.346	0.079	0.076	0.299
Gender	0.011	0.050	0.823	-0.076	0.055	0.172
Income	-0.002	0.006	0.754	0.004	0.006	0.548

Note. Montessori group CFI = 1.0; TLI = 1.0; control group CFI = 0.74; TLI = 0.63.¹

Parameters	Montessori group			Control group		
	Estimate	SE	<i>p</i> value	Estimate	SE	<i>p</i> value
Intercept						
Race	0.531	0.353	0.132	0.543	0.399	0.110
Slope						
Race	0.001	0.093	0.989	-0.051	0.119	0.667
Gender	-0.004	0.057	0.945	-0.115	0.085	0.177
Income	0.001	0.011	0.936	0.006	0.009	0.483

Note. Montessori group CFI = 1.0; TLI = 1.0; control group CFI = 0.85; TLI = 0.80.¹

¹ Because the fit indices for ToM and EF models for the control indicated that the two linear growth curve models did not have a good fit, we tried to fit nonlinear growth curve models for this subpopulation to analyze the change of ToM and EF. Given the number of time points and the limited sample size, we could fit only a latent basis growth curve model or a quadratic growth curve model. The latent basis model either did not converge (for EF) or had a similar fit as the linear growth curve model (for ToM). Although the quadratic growth curve models converged and had better fits (CFIs > 0.9, TLIs < 0.9), there were warning messages in Mplus that the latent variable covariance matrix was not positive definite, indicating the model specification was not appropriate for the data.

All model-fit indices are sensitive to sample size. As Lai and Green (2016) discussed, the fit indices by design evaluate the model fit from different perspectives, the cutoff values for the indices are arbitrary, and the meaning of “good” fit and its relationship with fit indices are not well understood. These problems are all the more salient for small samples. Given the relatively small sample size of our data, even if we fit the quadratic growth curve models, we cannot reach a consistent conclusion based on different model-fit indices (e.g., CFI > 0.9, TLI < 0.9). In fact, for EF in the control sample data, when we fit a quadratic model instead of a linear model, CFI increased from 0.85 to 0.92, but TLI decreased from 0.80 to 0.76. The linear growth curve model is parsimonious and consistent with the models for the Montessori group. Therefore, we decided to report the results from the linear growth curve models, although the fit indices are a bit less than the good fit value 0.9. We would like to note that it is a limitation that the linear growth curve models do not fit the EF and ToM data of the control group as well as they fit the data of the Montessori group.



Book Review

The Bloomsbury Handbook of Montessori Education

Edited by Angela K. Murray, Eva-Maria Tebano Ahlquist, Maria K. McKenna, and Mira Debs
Bloomsbury Academic, 2023, 616 pp., 10 × 7 inches, US\$175 (hardcover), ISBN 9781350275607

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Keywords: *Montessori education, Maria Montessori, Montessori pedagogy, Montessori research, global Montessori*

The Bloomsbury Handbook of Montessori Education is the first comprehensive collection of scholarly work that spans the spectrum of Montessori education, including historical, political, geographic, pedagogical, scientific, and cultural perspectives. It offers different entry points for those interested in various aspects of Montessori education—advocates, researchers, academics, parents, and teacher educators—to expand their current knowledge about the Montessori pedagogy and movement. The handbook approaches known ideas with an interdisciplinary lens.

Maria Montessori's critical writings and radical approaches cemented her legacy. Now, nearly 115 years after her first publication, essential dialogues and critical reflections are emerging about complex social issues in the context of Montessori education. These dialogues recognize the strengths and limitations of the Method as well as the harmful and disrespectful ways Montessori education has entered different communities, countries, and Indigenous lands.

This valuable resource brings together historical and current issues concerning education globally. This is not a how-to guide for Montessori classrooms but rather a text intended to inspire conversation, research, and reform for the advancement of the Montessori movement and the field of education more broadly. The handbook contains 62 chapters with nearly 100 authors and contributors from 25 countries, representing a comprehensive collection from Montessori researchers, historians, academics, and advocates from around the globe.

Divided into six parts, *The Bloomsbury Handbook of Montessori Education* is constructed in a somewhat chronological order. The format allows the reader to first gain historical perspective to better understand the pedagogy. This handbook combines biographical and political histories, education history and philosophy, and Montessori education timelines, which together provide important context for how the Montessori movement and pedagogy have evolved. The handbook also brings readers up to date on the global reach of Montessori

education, the current state of Montessori research, and an introduction to contemporary considerations for the world we now inhabit. The approach allows the reader to reflect on the global reach of the philosophy, implications of implementation, and practice through presented research and lived experiences. Each part and chapter provides critical analysis connecting traditional and long-standing beliefs about Montessori theory to new ideas and research. An analysis of Montessori's writings and history—through contemporary literature and research in gender, diversity, culture, and colonization of Indigenous lands and communities—is included.

The handbook invites readers to reflect on beliefs and biases and demonstrates that change is needed. By elevating contemporary voices, the handbook lets readers see the Montessori philosophy as a living pedagogy that can grow, embody, and respect the cultures and languages in their communities. Recommendations for advancement reflect current research and honor the voices of those who have been underrepresented in the Montessori community.

Part I. Foundations and Evolution of Montessori Education

Part I of the handbook is composed of four chapters focusing on Montessori herself, her life, and the historical landscape, which highlight the framework in which the Montessori pedagogy was developed. Commonly known facts about Montessori and her early years are included: family history, university experience, and her now-famous entry into the study of early childhood and the Casa dei Bambini experiment, which catapulted her to the global stage. Part I references the many historical writings and research about her life (Babini, 2000; Gutek & Gutek, 2016; Kramer, 2017; Moretti, 2021; Povell, 2009). This part also includes crucial information about the political landscape of Montessori's time and her role as a feminist, including the fact that her first public appearance was political, creating further space for understanding her scientific and political approaches in attempts to secure equal rights for children and women. Part I of the handbook concludes with the philosophy of Montessori and explains that she did not create her philosophy and approach to education in an egotistical bubble. Instead, the last chapter in Part I highlights the many philosophers, educators, and contemporaries who inspired her.

Part II. Key Writings of Maria Montessori

Part II encourages further reading of Montessori's publications. The chapters in Part II are devoted to sharing Montessori's writing sequentially by publication date and theme, and they then move to her later scholarly writings. Part II begins with *Il Metodo della Pedagogia Scientifica applicato all'educazione infantile nelle Case dei Bambini* or *The Montessori Method* (Montessori, 1909/1912), first published in 1909. Various editions were published; the last edition, published in 1950 and entitled *The Discovery of the Child* (Montessori, 1950/2004); the significance of the revisions through the years are discussed. The level of detail outlined in the evolution of Montessori's book *The Montessori Method* (Montessori, 1909, 1912) includes citations of notable authors and researchers of her time. It is also punctuated with historical time stamps for a greater regard for new language and variations in later texts. This provides evidence that Montessori believed that her philosophy and pedagogy needed to be fluid to respect new ideas. Part II looks at the driving force behind Montessori's pursuits. Her personal spiritual understanding of the child and the desire for peace moved her to promote the rights for children to meet their fullest potential.

Part III. Montessori Pedagogy Across the Lifespan

Part III is composed of six chapters outlining the Montessori environment and pedagogy in each of the Montessori age levels. Beginning with the youngest age groupings, the lifespan discussions review the approach for birth to 3-year-old Montessori settings, routinely called Nido and Toddler communities (Campanelli, 2021); it continues with the Children's House for 3- to 6-year-olds, Elementary for 6- to 12-year-olds, and the Erdkinder for adolescents ages 12 to 15. Part III culminates with the adult/teacher transformation.

Part III offers specific examples of didactic materials and environment descriptions, and it connects readers to key tenets of the philosophy, such as the planes of development, sensitive periods, and the prepared environment. This chapter briefly connects culture, the prepared teacher and environment, and, using Montessori's writings, the responsibility of the adult to children and families. Later chapters revisit this conversation to note instances where inclusivity of culture has not been honored in communities and where failures to respect and hold space for noncolonial traditions and

beliefs are criticized. The last chapter of Part III focuses on the teacher and the transformation to becoming a Montessori guide. The chapter explores aspects of human development that are foundational for Montessori teachers, definitions of competence, and the reflective internal and external evaluation process.

Part IV. The Science of Montessori Education

Part IV is composed of 10 chapters highlighting areas of Montessori research, gaps in current research, future research questions, and ideas to extend the work. In the first three parts of the handbook, we see how many of the chapters intersect with areas of research. In this part, Montessori theories are supported with current empirical findings. The beginning of Part IV provides foundations for Montessori research, with the first chapter offering evidence from modern neuroscience for Montessori's key hypotheses (i.e., importance of touch and parental stimuli, the existence of critical periods and language structures, the importance of movement for brain development, and the role of working with the hands for thinking and language development).

The next chapter introduces the benefits of a Montessori-research logic model and is followed by a chapter on establishing Montessori fidelity for research purposes. As the field of Montessori research and outcome assessment for different aspects of the pedagogy grows, researchers need such tools as they make the case for what constitutes "authentic Montessori environments" and outline the theory of causes and effects leading to Montessori outcomes. Part IV then provides new areas of research for discovery and discussion, as well as Montessori connections to current research in neuroscience. Chapters include research on motivation and self-determination, executive functioning, memory, and various areas of neuroscience, including a fascinating new area of research: error monitoring. *Error monitoring* is the intrinsic ability to correct a mistake or error and to prevent that mistake from happening again. The research aligns with evaluating risk taking in educational settings and suggests important benefits of Montessori education in fostering healthy error monitoring. Current research regarding Montessori education is promising and is bridging gaps among policy, educational stakeholders, decision makers, and education reform. The authors and contributors for Part IV identify areas of limitations in recent studies and provide critiques in research design. More research is needed related to inequality, stereotypes,

and social injustices in marginalized communities where Montessori exists and where it could expand. Part IV concludes with a call to further advance Montessori research in each of these areas.

Part V. Global Montessori Education

Part V presents case-study examples of local adoptions and cultural adaptations of Montessori pedagogy across more than 25 countries. The section begins by bringing readers to the roots of Montessori education and its origins in Italy. Each chapter has a similar structure, with a focus on the beginnings of the Montessori movement in the country or region, followed by the impact on communities, education laws, and politics that influenced a progressive choice such as Montessori education. Most chapters in this part include the postwar period and the evolution of Montessori education in different countries. The chapters in Part V close with the contemporary landscape, including who funds Montessori education and how the Montessori movement is connected to local Montessori organizations and trainings. Throughout Part V, a recurring theme of barriers to expansion and access is highlighted. Barriers to access include limited understanding of respecting cultural needs, necessary adaptations of Montessori practices while maintaining fidelity to authentic principles, cost of materials, and a limited number of well-trained Montessori teachers. The aspects of accessibility and inclusion will prevent some countries from accepting or expanding the Montessori pedagogy.

Notable case studies in Part V include (a) Montessori education in Ireland and the historical background for the development of the Catechesis of the Good Shepherd, which is the Montessori approach to teaching biblical stories; (b) the Montessori movement and Method in Germany and their significant impact on how teachers are trained to support children with disabilities; (c) the effort and investment to include Montessori schools in Saudi Arabia's commitment to increase kindergarten enrollment by 78%; (d) Australia's Montessori community and the development of a new area of research and practice: Montessori for dementia and aging; (e) Indigenous language and cultural preservation in Canada; (f) the United States Montessori community's work in implementing diversity, equity, inclusion, and belonging initiatives; and (g) Puerto Rico's story of successfully maintaining Montessori programs after natural disasters and recent political challenges.

The authors in Part V acknowledge that more work is needed in Latin America and Africa to understand Montessori history and in the best strategies to be respectful of all cultures and beliefs. Latin American and African countries often experience Montessori education as implemented by religious and relief organizations. Despite the intention to educate and serve rural, low-income, and disabled children, the approach historically promoted or perpetuated western colonization.

Part VI. Contemporary Considerations Regarding Montessori Education

Part VI comprises the remaining 10 chapters of the handbook. Chapter themes cover a variety of topics, including Montessori education and technology, teacher preparation, gender, inclusion, plurilingual environments, Critical Race Theory, Indigenizing of Montessori education, Montessori interventions for persons with dementia, and Peace education. Perspectives are shared and supported by research, lived experiences, and reflective practices that allow a critical review of the Montessori pedagogy. A sampling of critical thoughts includes further analysis of a statement in an earlier chapter that Montessori materials and approach are gender neutral. This statement is explored using current thoughts on gender and education. Another example relates to cosmic education, which is the Montessori framework for educating children ages 6 to 12, described at length in Part III. The universality of cosmic education is challenged in Part VI, as many Montessori teachers approach the stories and fables from a colonial lens, and they exclude origin stories from Indigenous communities. By offering critiques of the Montessori pedagogy and movement through the analysis of contemporary social issues, authors in Part VI provide a space for personal and professional evaluation, reflection, growth, and, most importantly, a call to action.

Conclusion

The Handbook of Montessori Education advances scholarly perceptions of Montessori philosophy and pedagogy, providing a global and critical analysis. The volume highlights the positive influences of Montessori education for children throughout the world and the social, ethical, ethnic, and national nuances that may not have been considered previously in the Montessori movement. The handbook provides future considerations for Montessori advancement, research, and reform to

overcome Montessori education's image of elitism and noninclusivity. The handbook is a valuable resource for those seeking scholarly discussion of Montessori philosophy and pedagogical practice, for those wanting insight on Montessori and education reform, and for practitioners and teacher educators facing contemporary educational challenges around the world.

About the Author

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Mortarboard Review: Montessori-Related Dissertations 2022–2023

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Keywords: Montessori research, Montessori dissertations, Montessori adolescent education, technology in Montessori education, equity in Montessori education, public Montessori education

Abstract: This article is the first in a series of planned reviews to be published annually that highlight a selection of dissertations. Some aspects of the selection and review methodology may be adjusted in coming issues as the process is refined to maximize the value to the field. Twenty-three Montessori-related dissertations completed during 2021 and 2022 were identified that represented five broad categories based on topic or subject matter. Two dissertations were selected for inclusion in this review because they represent high-quality research in areas that are of particular relevance and value to the field at this time: (a) public Montessori education and issues of equity and intercultural competence and (b) teacher perspectives and technology.

Each year, doctoral students around the world complete their programs in higher education by writing and defending their dissertations. These students have completed a significant project that results in a thoroughly researched manuscript. Unfortunately, these papers are not widely indexed and may be stored only within an institutional repository or a database devoted solely to dissertations and theses. This process limits exposure to other scholars, yet many of these works make valuable contributions to the field. We are currently in the middle of spring in a new calendar year, so it seems appropriate to highlight some notable dissertations from the past

two years that focus on elements related to Montessori education.¹

We began the selection process by searching a number of databases and repositories with international coverage, including EBSCO Open Dissertations (<https://biblioboard.com/opendissertations>), Networked Digital Library of Theses and Dissertations (<http://search.ndltd.org>), Open Access Theses and Dissertations (<https://oatd.org>), and ProQuest Dissertations and Theses (<https://www.proquest.com>).

1. This article is the first in this series, so we have selected from two calendar years. In the future, we will draw on only one calendar year.

We independently searched for relevant dissertations to consider and then combined our lists, which yielded 23 unique dissertations in English from 2021 and 2022. The dissertations were then categorized by topic or subject matter. From this exercise, four categories were identified, and dissertations from these categories were considered for review. Categories included technology and teacher perspectives, public Montessori education and equity and intercultural competence, psychology and human development, and history and educational contexts. Further evaluation included an exclusion of any dissertations that had previously been published (e.g., article, book) and a consideration of the status of the universities represented (e.g., not for profit/for profit, public/private, religious/secular). Any dissertation that was published elsewhere was not considered, and we determined that all dissertations would be evaluated on their own merit regardless of the university's status. Two of the 23 dissertations were selected for inclusion in this review because they represent high-quality research in areas that are of particular relevance and value to the field at this time: (a) public Montessori education and issues of equity and intercultural competence and (b) teacher perspectives and technology.

Public Montessori Education and Issues of Equity and Intercultural Competence

In the United States, the history of educational opportunities for children of color and low socioeconomic status (SES) has a complicated past (Crutchfield et al., 2020). These factors have a compounding effect that lasts a lifetime and often across generations (O'Brien et al., 2020). Within the past century, social and legislative actions have addressed this reality and provided children with quality educational opportunities, regardless of SES and race/ethnicity (Bilingual Education Act, 1967; Elementary and Secondary Education Act, 1965; Equal Educational Opportunities Act, 1974; Every Student Succeeds Act, 2015; Improving America's Schools Act, 1994; No Child Left Behind, 2002). One proven method has been the introduction of public Montessori schools. These schools have been shown to provide supportive and effective learning environments for children of color and low SES, and the following dissertation is a case study of one such school (Debs & Brown, 2017).

Summers, H. E. (2022) *Hybrid Montessori education: Teacher reflections on the care and education of underserved Black children* [Doctoral dissertation, DePaul University].

https://via.library.depaul.edu/soe_etd/228

In a dissertation from 2022, Heather E. Summers explored “how Montessori education today functions outside of highly resourced, private school environments that educate mostly white children” through a case study of one public Montessori school in the midwestern United States (p. 75). This school “addresses the educational, social, and emotional needs of Black children” (p. 75) through a hybrid approach that embraces principles of Montessori education, “tenets of culturally responsive teaching, and elements of an education for social justice” (p. 130–131). Summers ultimately asserted—and demonstrated through the data collected—that this school is an example of how this hybrid model is working for this community and may be a model for other similar communities. In this context, somewhat confusingly, Summers used the term *hybrid* to describe the combined use of practices, principles, and goals, as opposed to the more commonly used reference to the use of technology within educational practices.

Through an extensive literature review, Summers described in clear language the principles and philosophy of Montessori education while also providing a historical account of Montessori education within the United States. Approaching her study from a social justice perspective, Summers asserted that the Montessori Method “was and is intended to reverse oppressive constructs often found in traditional education” (p. 3). Summers's historical account documented the evolution of Montessori education within the United States, culminating with the present-day public Montessori movement.

Defining the problem her study addresses, Summers explained that public Montessori schools (including magnet and charter schools) must navigate the friction between an education model that embraces liberty and social justice (Montessori education), while being constrained by a public education system that reinforces an inequitable social structure. Summers acknowledged that public Montessori programs face challenges when maintaining the fidelity of the Method while being situated or entangled within the confines of district and state standards.

Through a qualitative case study, relying on semistructured interviews with teachers and administrators (collectively identified as educators), Summers examines three key questions: (a) What conditions have shaped the culture of the school? (b) How are this school's educators responding to the impacts imposed by those conditions? and (c) How does the school characterize and operationalize education for social justice in its educators' daily practice and overall school culture (p. 10). In her results, Summers identified three themes: trauma, inequality, and racism.

Summers found that educators in this school must modify their practices in a way that acknowledges the school having what the interviewees described as a "culture of trauma" (p. 78) resulting from violence and poverty in the community. Summers examined how inequity and inequality manifest, along with their consequences. One example she identified is standardized testing and its direct existential and financial consequences to the school because children are expected to perform at the same level and pace according to their age rather than their developmental stage. Finally, Summers's data revealed the effect of racism on the educators and students even though she "did not directly pose any questions to the participants regarding race" (p. 92). For example, Summers aptly referred to the "racialized conditions" (p. 92) described by participants in areas, such as the neglect of the school's physical conditions.

A theme that transverses Summers's work is that implementing the Montessori Method in a public school that educates predominantly low-income Black children is not enough to combat the systemic barriers (i.e., trauma, inequity, racism) that these children and their families experience. Montessori education can be practiced in a way that is culturally sensitive and responsive; however, this is not the default. Summers's case study documented how the Montessori Method of education is being implemented as a culturally sensitive and culturally responsive tool that allows educators to assist each child to develop and achieve their potential, regardless of their SES. Summers's research revealed that educators are using Montessori principles to face the challenge of "changing the damaging narrative that structural racism has embedded in public education" (p. 130). The educators are aware of the lived experiences of their students and seek to create a school environment that is culturally responsive and conducive to learning. By emotionally and developmentally meeting the children where they are, these educators have been able to help

these children grow and learn in ways that will hopefully lay the groundwork for lifelong learning and wellbeing.

Summers's research revealed that—through collectivist cultural practices (i.e., social norms, beliefs, and behaviors that prioritize the needs and goals of the group or community over the individual), professional development that empowers educators with a consistent set of tools and a grounding in Montessori practices—the children and educators at this school have been able to overcome the adverse sociocultural conditions they were given. This may be a model for other similar environments and other public Montessori programs. To this end, Summers included a section with recommendations for "those who work in public Montessori schools as well as those who advocate for Montessori in the public sector" (p. 155). These recommendations (pp. 155–160) provide evidence-based information about what has worked in this community that may be effective in other contexts. Through the evidence gleaned by these qualitative interviews and the evidence-based recommendations, Summers has made a valuable contribution to the field.

Technology and Teacher Perspectives

Although digital technology pervades today's society, its use in Montessori classrooms varies widely. Digital tools that are available in most people's pockets could not have been anticipated by Maria Montessori and her contemporaries, but it has been argued that she embraced the technology of her day and may have seen the potential of today's devices (Park & Murray, 2023). Others are concerned about the degree of abstraction necessary to leverage such tools, so modern Montessori educators grapple with the appropriate role of technology in the Montessori approach across stages of development. Support for introducing technological tools in the youngest Montessori classrooms is inconsistent, but more agreement is evident in the need for technology as children get older. As the technology debate grows in the field of Montessori education, the topic is surfacing as an interesting focus for doctoral dissertations.

Williams, A. M. (2021) *Technology in the Montessori adolescent environment* [Doctoral dissertation, Grand Canyon University].

<https://www.proquest.com/docview/2599175728>

Montessori recommended that students who are in the third plane of development, ranging in age

from 12–15 and 15–18, be educated in a way that recognizes them as *Erdkinder*, or children of the earth, whom she envisioned being best educated in a farm-school setting. Programs at today's Montessori middle and high schools work to honor Montessori's original ideas; however, as Alicia Marie Williams noted in her 2021 dissertation, the number of people living in rural environments has decreased in the United States, and adolescent Montessori programs now strive to transition students into a world where technology holds a large role. Williams's project describes how adolescent programs address technology in the classroom.

Williams focused her research on Montessori adolescent teachers and addressed a gap in the literature about the Montessori adolescent environment regarding the use of technology. In her paper, she operationally defined technology as "static or mobile equipment which connects to the internet and/or global positioning systems" (p. 20), including examples such as computers, phones, or classroom smartboards. The dissertation explores how Montessori adolescent teachers describe using technology; how they describe using technology in thematic, or interdisciplinary, learning; and how Montessori adolescent teachers view the use of technology to inspire citizenship and the work of the head, hands, and heart.

Williams included interview and focus group data, along with a screening questionnaire and digital artifacts, to demonstrate how Montessori adolescent teachers are using technology in their classrooms. In her analyses, Williams discovered eight deductive themes. In considering how Montessori adolescent teachers describe using technology (research question [RQ] 1), the themes that arose were balancing technology and Montessori education, which included teaching students online safety and digital citizenship. Three themes arose from RQ2, which explored how Montessori adolescent teachers describe using technology in thematic learning: technology with individual students, technology with groups of students, and how technology changes teaching. In RQ3, which addressed the use of technology to inspire citizenship, three themes arose: technology for life lessons, technology in microeconomics, and technology in service learning. The inductive themes emerged, then the ways in which COVID changed school life, and, finally, ways that technology melded with Montessori education.

Williams provided a list for teachers of ways that they might consider including technology in their environments. She closed by suggesting that Montessori

organizations could do more to provide guidelines regarding technology and that Montessori training centers should consider addressing how to use technology in the classroom.

Williams's study began to answer essential questions about technology and the Montessori adolescent environment. Her interviews and focus groups provided rich data about what current practices are, and, through the voices of the teachers, Williams shared concerns. When a study is the first to examine a phenomenon, it can be difficult to know what questions to ask and what type of data to collect. This qualitative descriptive dissertation allowed participants to guide the process, providing a ground-up view of technology in the adolescent classroom. Including the perspective of students in the teachers' classrooms would have been enlightening. Further exploration could include a couple of questions: Do the students feel comfortable with technology? Do they believe that their teachers use it too much or not enough? Addressing these questions and other related queries would be a logical next step for future research into the use of the modern tools of technology in the Montessori adolescent classroom.

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Appendix: List of 2021–2022 Dissertations Considered

Psychology and Human Development

Mamani, P. L. L. (2022). *Links between screen time, Montessori preschool exposure, and working memory* [Doctoral dissertation, Walden University]. <https://www.proquest.com/docview/2747902366>

Nguyen, L. (2022). *SSIS SEL as a determinant of Montessori education's impact on SEL outcomes* [Doctoral dissertation, Capella University]. <https://www.proquest.com/docview/2622942402>

Technology and Teacher Perspectives

Andell, S. (2022). *Outside the prepared environment: How Montessori teacher training influences practitioner attitudes to technology* [Doctoral dissertation, William Howard Taft University]. <https://files.eric.ed.gov/fulltext/ED618535.pdf>

Benson, J. R. (2022). *Assessing relationships among autonomy, supportive leadership, and burnout in public elementary teachers* [Doctoral dissertation, Walden University]. <https://www.proquest.com/docview/2652185676>

Borgman, C. (2021). *Enacting accountability in innovative schools: The sensemaking strategies of public Montessori principals* [Doctoral dissertation, University of Virginia, 2021]. <https://doi.org/10.18130/v3-v7x1-a966>

Ghandour, Y. (2022). *Teacher and director beliefs about their simultaneous implementation of the Montessori Method and Quebec's educational programme* [Doctoral dissertation, Concordia University]. <https://spectrum.library.concordia.ca/id/eprint/990328/>

Goss, A. M. (2022). *Young children's mathematical spatial reasoning in a Montessori classroom* [Doctoral dissertation, Université d'Ottawa/University of Ottawa]. <https://doi.org/10.20381/ruor-27979>

Madrigal, M. V. (2022). *The effects of a preschool program on kindergarten achievements* [Doctoral dissertation, Saint Peter's University]. <https://www.proquest.com/docview/2720980099>

Mann-Bailey, M. P. (2021). *Project-based and student-centered learning in teaching the Montessori social development curriculum* [Doctoral dissertation, Grand Canyon University]. <https://www.proquest.com/docview/2584058648/abstract/8007C961141442F3PQ/1>

Williams, A. M. (2021). *Technology in the Montessori adolescent environment* [Doctoral dissertation, Grand Canyon University]. <https://www.proquest.com/docview/2599175728>

Public Montessori, Equity and Cultural Competence

Elsherbeeney, H. (2022). *Examining elementary students' development of intercultural competence through self-regulatory prompts* [Doctoral dissertation, George Mason University]. <https://www.proquest.com/docview/2712765555>

Jackson, J. R. (2022). *Maintaining the Montessori Method in Louisiana public schools: A qualitative descriptive study* [Doctoral dissertation, Grand Canyon University]. <https://www.proquest.com/docview/2686240438>

Lovett-Cunningham, L. K. (2022). *Head Start teachers' descriptions of inclusion* [Doctoral dissertation, Walden University]. <https://www.proquest.com/docview/2642344173>

Moses, C. A. (2022). *Journaling for equity: A self-reflective process of discovery for middle school teachers in public charter Montessori schools* [Doctoral dissertation, University of Oregon]. <https://www.proquest.com/docview/2715395856>

Summers, H. (2022). *Hybrid Montessori education: Teacher reflections on the care and education of under-served Black children* [Doctoral dissertation, DePaul University]. <https://www.proquest.com/docview/2671606105>

Teems, H. (2021). *The benefits and barriers to arts integration: Arts accessibility in public Montessori* [Doctoral dissertation, University of New England]. <https://dune.une.edu/theses/363>

History and Education Contexts

Campanelli, C. (2021). *Birth to three language acquisition: Influences of ambient language in the Montessori setting* [Doctoral dissertation, Long Island University]. https://digitalcommons.liu.edu/post_fultext_dis/29

Green, R. E. (2022). *Examining adolescent voices in urban Montessorianism within the third plane of development* [Doctoral dissertation, University of Louisville]. <https://doi.org/10.18297/etd/3802>

Carreras, M. V. (2022). *A local affair: Barcelona's municipal schools and recreational activities in late Francoist Spain, 1950–1975* [Doctoral dissertation, University of California, San Diego]. <https://escholarship.org/uc/item/4km703xh>

Johnson, V. J. (2022). *Education anywhere? A constructivist grounded theory study of Montessori around the world* [Doctoral dissertation, The University of Nebraska—Lincoln]. <https://www.proquest.com/docview/2708187605>

Horan, Sister G. M. (2022). *Incorporating Dr. Montessori's Catholic vision within a religiously diverse Catholic school* [Doctoral dissertation, The Catholic University of America]. <https://www.proquest.com/docview/2679732853>

Tindall, R. (2022). *Architecture and students' physical activity in learning environments* [Doctoral dissertation, University of Notre Dame Australia]. <https://researchonline.nd.edu.au/theses/343>