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ORIGINAL PAPER

Beyond language: conceptualizing epistemic violence against Black immigrant students in mathematics education

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Abstract
This paper provides on-the-ground accounts of epistemic violence against Black immigrant children in mathematics classrooms. From a critical feminist perspective, we introduce Dotson's notion of silencing as an enactment of epistemic violence. According to Dotson, one way to enact epistemic violence is to damage a particular group's ability to speak and be heard. A successful act of communication depends on the audience's willingness and ability to "hear" the speaker. Therefore, denying this reciprocity in communication is a form of epistemic violence. Using this conceptualization, we conducted a secondary data analysis from a larger study aimed at enhancing teachers' knowledge and abilities to implement problem-solving teaching. We identify and characterize three practices of silencing Black immigrant students in Chilean mathematics classrooms that damage their agency as knowers and doers of mathematics. Beyond language issues, we show that silencing is a form of anti-Black onto-epistemic violence that prevents Black immigrant students from being recognized as legitimate subjects of knowledge in mathematics classrooms.

Keywords Epistemic violence · Practices of silencing · Black immigrant students · Mathematics communication · Anti-Blackness

1 Introduction

Our research on the experiences of Black immigrant students in Chile provides evidence of the mechanisms and practices that hinder their participation during the collective construction of mathematical knowledge (Valoyes-Chávez, 2021; Valoyes-Chávez and Andrade-Molina, 2022; Valoyes-Chávez & Darragh, in press). In Chilean elementary and secondary mathematics classrooms, Black immigrant students' mathematics contributions are consistently "unheard" and ignored by teachers and peers. In Valoyes-Chávez and Darragh (in press), we identified instances where the teacher either disregarded or belittled the Black immigrant students' attempts to participate in the proposed mathematics activity. We also documented interactions in a secondary mathematics classroom where their peers systematically ignored the contributions of two Black immigrant students from Haiti during small group problem solving (Valoyes-Chávez & Andrade-Molina, 2022). In these classrooms, the students' mathematics contributions were rendered invisible. This "invisibilization" resulted in the marginalization and exclusion of Black students from the mathematical activity and thus functioned as a technology of racial power that fabricated the Black child as an impossible mathematics learner (Valoyes-Chávez & Darragh, in press). The attempts of Black immigrant students to engage in mathematics conversations, and the failure of teachers and peers to listen to such conversations, seem to configure "failed" linguistic interchanges (Dotson, 2011). An important question that has emerged for us relates to the nature of this "failure" in mathematics communication. Language seemed not to be "the problem" as the immigrant students were either fluent in Spanish (the Black students from Haiti) or it was their

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home language (Black students from Colombia). Assuming that teaching by telling in traditional classrooms and small group discussion in reformed mathematics classrooms are standard epistemic practices, we wondered about the damage these 'failed' linguistic interchanges might have done to the Black immigrant students' agency as doers and knowers of mathematics. We also wondered whether the "failure" in communication was an issue of credibility; therefore, as Fricker (2007) states, Black students were subjected to epistemic injustice in the mathematics classroom. Were the "failed" linguistic interchanges a form of violence against this student population? If so, how might this form of violence be identified and documented?

The realization of failed linguistic interchanges as instances of a particular form of violence against Black immigrant students in mathematics classrooms came to us from two different conceptual sources. First, we found inspiration and theoretical grounding in the work of Spivak (1988), Dotson (2011), and Fricker (2007). From the philosophy of knowledge, these scholars offered us powerful concepts for approaching the "failure" in mathematics communication between Black immigrant students and their teachers and peers. Spivak's (1988) notion of epistemic violence and Fricker's (2007) discussion of epistemic injustice opened a path to approach the identified failed linguistic interchanges from an epistemic standpoint and beyond a mere issue of language in mathematics classrooms. Subsequent reflections and discussions led us to Dotson's (2011) notion of *Silencing* as an instance of epistemic violence. Dotson (2011) affirms that "damag[ing] a given group's ability to speak and be heard" (p. 236) is one way of perpetrating epistemic violence not only against social groups at the macro level of society but also at the micro level of everyday interactions. It became clear to us that, as Setati (2005) states, language in mathematics education is more than a tool for thinking and communicating and "has always been interwoven with politics of domination, separation, resistance, and affirmation" (p. 450).

Second, research on anti-Blackness in mathematics education (Davis, 2021; Gholson & Wilkes, 2017; Martin, 2019; Osibodu, 2021) also helped us to shed light on the nature of the identified failed linguistic interchanges. Anti-Blackness, understood "as an antagonism in which the Black is a despised thing-in-itself (but not a person for herself or himself) in opposition to all that is pure, human(e) and White" (Dumas & Ross, 2016, p. 416), is at the core of the mathematics education system of practices and materializes in forms of systemic violence. Indeed, anti-Blackness in the field allows for the denial to Black students of Western values associated with humanity such as civility, morality, intelligence, and adulthood. Martin et al. (2019) delve into the existing literature to unpack symbolic and epistemological forms of violence at the research level. Symbolic violence, for example, manifests itself in the persistent elaboration and naturalization of racial hierarchies of mathematics abilities in which Black students are positioned at the bottom, thus reinforcing stereotypical representations of who can and cannot do mathematics. Similarly, epistemological violence refers to the ongoing discursive construction in research of Black children as deficient and broken mathematics learners in need of pedagogical interventions to 'fix' them, "despite the fact that alternative interpretations equally viable based on the data are available" (Martin et al., 2019, p. 42). This way of representing Black children in mathematics education research builds on various technologies of race power and has contributed to centering white people's epistemic practices and whiteness as the norm in the field (Valoyes-Chávez & Darragh, in press). From the standpoint of scholarship on anti-Blackness, school mathematics has also been described as a site of suffering for racially minoritized children (Gholson & Wilkes, 2017) and "inherently violent for many Black children" (Martin et al., 2019, p. 32). At the mathematics classroom level, Black students experience violence through microaggressions and microinvalidations (Davis, 2019; Valencia-Salas, 2017). Martin (2019) suggests that:

> Those who believe in the humanity of Black people actively resist and reject mathematics education research that results in epistemological violence and mathematics reforms that perpetuate antiblackness. These forms of research and reform should be identified, critiqued, and summarily opposed. (p. 471)

However, little has been done to examine epistemic violence against Black children at the classroom level. Based on this conceptualization, we approach the failed linguistic interchanges as instances of *Silencing*, as proposed by Dotson (2011), constituting a particular form of anti-Black violence against Black immigrant students in Chilean mathematics classrooms. We contend that this violence is epistemic because, as Fricker (2007) argues, it damages the Black child's agency and credibility as a knower and doer of mathematics.

In this paper, we use Dotson's approach to epistemic violence as a theoretical lens to conduct a secondary analysis (Ruggiano & Perry, 2019) of our data collected in Chile. Dotson's notion of silencing allows us to provide on-the-ground accounts of epistemic violence against Black immigrant students in Chilean mathematics classrooms. While mathematics education research has shed light on symbolic and epistemic forms of violence (Chronaki et al., 2022; Ruge, 2018; Tanswell & Rittberg, 2020), the documentation of on-the-ground accounts of epistemic violence during mathematics teaching and learning is scarce. This holds particularly true in the case of Black students who are subjected

to systemic forms of anti-Black violence in mathematics education. Little is known about the mechanisms and practices that damage the agency and credibility of this student population as doers and knowers of mathematics. Emerging research questions relate to the theoretical characterization of epistemic violence against Black children and methodological tools for the identification of this type of violence in mathematics classrooms. The research presented in this paper seeks to advance the extant knowledge on what counts as language, mathematics, and the Black student in contexts of global mobility to shed light on the articulation of language, anti-Blackness, and mathematics teaching and learning practices. For this paper, our research questions are stated as follows:

What are on-the-ground accounts of epistemic violence against Black immigrant students in Chilean mathematics classrooms?

How can these on-the-ground accounts of epistemic violence be identified at the classroom level?

In the following sections, we first introduce Dotson's approach to epistemic violence and explain our use of her conceptualization of silencing to analyze the data. Second, we describe the context and methodology of our study. Then, to provide evidence of instances of silencing in Chilean mathematics classrooms attended by Black immigrant students, we present and characterize the selected episodes. Finally, we discuss our findings. We show that silencing goes beyond issues of mere linguistic interchanges and involves broader semiotic forms of communication that impact not only the agency of the Black immigrant student as a mathematics knower and doer but also their ontological positioning in the mathematics classroom. As we will discuss, silencing can be understood as a form of anti-Black violence that produces docile racialized mathematics learners.

2 Theoretical Framework

In this section, we discuss Dotson's (2011) notion of silencing as a form of epistemic violence. We elaborate on the conceptualization of the three main components of silencing —reciprocity, pernicious ignorance, and systematicity—that allow us to frame our analysis.

2.1 Silencing as a form of Epistemic Violence

The Indian feminist scholar Spivak (1988) first introduced the association between epistemic violence and silencing. Spivak argues that the historical silencing of subaltern groups is the result of a colonial process in which a particular form of rationality was introduced regarding the production of knowledge. This new cognitive pattern colonized and overrode other forms and practices of knowledge production (Quijano, 1993). Europe, the colonizer, became the "epistemic norm" with explanatory power, while the colonized became "the other" who has to be explained. However, this "other" has no voice or power to speak for themselves and can only be represented and interpreted by the colonizer. The silencing of subordinated groups results in the disappearance of their knowledge and ways of knowing. According to Spivak (1988), this silencing is one way of executing violence at the epistemic level. Epistemic violence can be understood as a series of systematic attempts to eliminate alternative epistemologies and to deny the subjectivity of human groups positioned as "the other" in ways that perpetuate and justify their domination and oppression. In this perspective, issues related to epistemic violence concern the production of knowledge, the recognition of the knowers' agency and their epistemic practices, and the mechanisms through which particular forms of knowledge are appropriated, shaped, and represented. Epistemic violence is a form of *slow violence* "that occurs gradually and out of sight, a violence[…] dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (Nixon, 2011, p. 2).

Various historical analyses have shed light on the silencing of members of oppressed groups (Pohlhaus, 2017). Much of the emerging interest in epistemic violence has come from theorists in the field of philosophy. However, little work has been done to identify existing practices that aim to silence people from marginalized backgrounds in everyday interactions and institutional settings (Dotson, 2011; Fricker, 2007). To address this gap, Dotson (2011) examines the different forms of silencing in everyday and institutional settings. By focusing on practices of silencing, Dotson brings attention to one of the fundamental epistemic practices: transmitting knowledge to others in everyday communicative acts through "telling" (Fricker, 2007). Dotson (2011) defines epistemic violence as "a failure of an audience to communicatively reciprocate, either intentionally or unintentionally, in linguistic exchanges owing to pernicious ignorance. Pernicious ignorance is a reliable ignorance or a counterfactual incompetence that, in a given context, is harmful" (p. 242). Based on this definition, three elements are fundamental to identifying on-the-ground accounts of silencing in everyday communicative interactions. The first element is the relationship of dependence between the audience and the speaker. Dotson (2011) addresses this speaker-audience dependence through the notion of *reciprocity*, which emphasizes the fact that the audience must be willing to grasp the meaning and sense of the speaker's words and discern their message and intentions. Reciprocity is necessary for successful linguistic interchanges and requires the audience to recognize the speaker's words and message as

intended. The speaker's chances to convey their message thus depend on the audience's willingness to "meet" their efforts as the linguistic exchange occurs and, consequently, her attempts to successfully communicate "*depends* upon the audience" (Dotson, 2011, p. 238). In this sense, reciprocity highlights an imbalance of power in every linguistic interchange as the speaker is placed in a vulnerable position. In contrast, the audience is placed in a position of power. On the one hand, reciprocity underscores the fact that the speaker and the audience are "conceived not in abstraction from relations of power (as they are in traditional epistemology, including most social epistemology), but as operating as social types who stand in relations of power to one another" (Fricker, 2007, p. 3). The speaker's and audience's positions in the social world are determined by identity markers such as race, gender, and class, among others, creating power imbalances in communication. On the other hand, reciprocity exposes the speaker's vulnerability in linguistic exchanges. The speaker must get their message across and be heard. However, to be heard and recognized are two actions the speaker cannot impose on an audience, and power imbalances may hinder reciprocal communication (Fricker, 2007). Therefore, the need to be heard and recognized exposes the speaker to various forms of silencing. Fricker (2007) highlights the role of prejudice and stereotypes in the speaker's chances of being positioned as a reliable and credible source of knowledge. Reciprocity in communicative acts is strongly tied to the audience's "perception" of the speaker. Moreover, ideological representations of particular social groups mediate their chances of being heard and may lead to the fabrication of such groups as disadvantaged identities in different social institutions. For example, the heteropatriarchal and anti-Black nature of mathematics education as a field of knowledge may undermine the credibility of Black women scholars. Racial and gender biases play a central role in the failure of reciprocal communication and reduce the chances of Black women researchers being positioned as credible subjects of knowledge in the field.

The second element to identify on-the-ground accounts of epistemic violence is a kind of ignorance that damages the speaker's credibility as a knower. Dotson (2011) calls it *pernicious ignorance* to underscore the lack of resources to accurately produce fair and accurate assessments about people from oppressed groups. In general terms, epistemic violence "is enacted in a failed linguistic exchange where a speaker fails to communicatively reciprocate owing to pernicious ignorance" (Dotson, 2011, p. 239). This ignorance should not be categorized as bad or good but judged concerning its contribution to the practice of silencing and its harmful effects on the speaker's credibility as a subject of knowledge. Mills (2007) argues that the damage done results from this "ignorance", which manifests in false beliefs about particular social groups. For example, in discussing the impact of white supremacy on the perceptions and social understandings of whites as a social group, Mills (2007) uses the term "white ignorance" as "a non-knowing, that is not contingent, but in which race—white racism and/or white racial domination and their ramifications—plays a crucial causal role" (p. 23). White ignorance, which is historically rooted and socially situated, configures the typical ways of "seeing" and perceiving Black people in different institutional and social contexts.

The notion of ignorance brings to the fore both the damage done to the speaker's status as a subject of knowledge by their membership affiliations and the need to locate the audience in its specificity as part of particular social groups. Therefore, it is critical to acknowledge the audience's cultural, racial, and ethnic positionings—among others—in the social world because such positionings configure its perceptions. In this sense, "[perception] is also in part conception, the viewing of the world through a particular conceptual grid" (Mills, 2007, p. 23). Thus, identifying the harm caused to the speaker's credibility as a knower by pernicious ignorance is context-dependent. It requires the analysis of the political, racial, and social contextual factors and the power relations involved in producing such harm.

The third element fundamental to identifying on-the-ground accounts of epistemic violence is the *systematic* occurrence of the practice of silencing. To be considered a practice rather than an accidental and occasional event, the audience's failure to recognize and take the speaker's words has to be a repetitive and reliable practice. In this regard, "a practice of silencing concerns a repetitive, reliable occurrence of an audience failing to meet the dependencies of a speaker that finds its origin in a more pervasive ignorance" (Dotson, 2011, p. 239).

At this point in our discussion, a caveat needs to be made. In linguistic exchanges, both the roles and the social positions of the speaker and the audience are contingent, fluid, and dependent on the institutional context in which the communication occurs. In such contexts, the speaker and audience constantly shift their roles. Linguistic exchanges in mathematics classrooms may form an initiate-response-evaluation pattern in which the teacher acts as the speaker and the students as the audience. However, these roles may shift, for example, in small group problem solving, where the students, seeking guidance in their work, act most often as the speakers and the teacher acts as the audience. The roles of the teacher and the students are therefore flexible and fluid, but depend on the nature of the mathematics activity. Moreover, according to Wagner and Herbel-Eisenmann (2014), in both cases the teacher is located in positions of power in the mathematics classroom. On the one hand, the

teacher is *an* authority because of their disciplinary knowledge domain. On the other hand, the teacher is *in* authority because of their institutional role. The teacher may exercise what Fricker (2007) calls social power, "a practically socially situated capacity to control others' actions" (p. 13) while teaching mathematics. In this perspective, the teacher, as a historical racialized perceiving subject in a position of power may either recognize or ignore the epistemic agency of Black students. This recognition of teacher's positioning in the mathematics classroom does not deny the students' agency to resist and contest the teacher's action but highlights the asymmetric relations of power in mathematics classrooms.

2.2 A method for identifying Practices of silencing in Mathematics Classrooms

Based on the above discussion, we draw on Dotson's approach and adopt three critical elements for identifying practices of silencing in mathematics classrooms. To be considered a practice of silencing the failed teacher-students linguistic interchange must:

- be caused by a reliable and identifiable ignorance;
- harm the student's epistemic agency and credibility; and.
- be a systemic, repetitive practice.

The first key element for identifying practices of silencing in the mathematics classroom relates to the **ignorance** that causes the failure in teacher-student linguistic interchanges. While identifying practices of silencing, it is critical to consider *what kind of "ignorance"* causes or contributes to the harmful practice to occur and *how*. Singling out a practice of silencing thus involves identifying *what* causes this ignorance, which divests the student's credibility and hinders them from being perceived as a rightful mathematics knower. The second element relates to the existence of **harmful** effects on the student's agency as a knower and doer of mathematics by any reliable ignorance. The harmful effects of silencing on the student can take several forms ranging from the failure to be recognized as a credible mathematical knower to the lack of recognition of their agency as a knower and doer of mathematics. The harm to the student's agency prevents them from using the shared resources available in the classroom to participate in the collective production of mathematics knowledge. The third element relates to the **systematic** occurrence of the practice, which causes the failure of a linguistic interchange involving a teacher and a student or a group of students. While an *instance* of silencing is an isolated, occasional event, the repeated occurrence of the failed linguistic interchange is, according to Dotson (2011), a distinctive feature of any practice of silencing.

3 Methodology

3.1 Context of study

To identify on-the-ground accounts of epistemic violence against Black immigrant children, we analyze data from a larger study aimed at enhancing teachers' knowledge and abilities to implement problem-solving teaching in elementary and secondary schools in Santiago, Chile (see Darragh & Valoyes-Chávez, 2019). A professional development (PD) program was designed with a focus on an instructional approach centered on solving non-routine mathematics problems by randomly organized groups of students. The implementation of the PD started in 2015, and over the following five years, the PD research team worked to scale up the program across different Chilean regions (Valoyes-Chávez & Felmer, 2021). This effort allowed the PD research team to reach a significant number of teachers in the country, document their learning experiences, and examine the PD's impact on their practices.

The participating teachers attended a one-year-long PD in which they experienced firsthand non-routine problem-solving. After each PD session, the teachers would implement the proposed problem-solving teaching approach with their students. These classes were filmed to provide feedback and document changes in their teaching practices. Other data were collected from in-depth interviews, video-motivated interviews, and recordings of the PD sessions.

The original research focused on problem-solving teaching rather than on power issues in teacher education. We were not part of the main research team that designed the study and the PD program. Luz joined the research team at a later stage in the research process, collected data in the form of deep and video-motivated interviews and conducted a preliminary analysis. Our initial concerns about the invisibilization of Black immigrant children in reform mathematics classrooms emerged from this analysis and led us to focus on the recordings and interviews of Julia, a Chilean white-*mestiza* elementary teacher. She participated in the larger study and was invited to provide more in-depth data about her experiences implementing problem-solving teaching. Julia's third-grade class was racially and ethnically diverse. Six newly arrived Black immigrant children from Colombia and the Dominican Republic attended it. Robert, Andrés, Dago, Jenny, and Ana came from Colombia, and Carla from the Dominican Republic. Four other non-Black immigrant students came from Bolivia and Peru, and eight were white-*mestizo* Chilean children. In contrast

to extant research examining the mathematics experiences of immigrant children, the students' mother tongue and the language of instruction were similar in our study. Spanish was the first language of both the participating teacher and the students. However, this is not always the case in other Chilean classrooms. For instance, children from Haiti speak Creole. These are essential indicators of the cultural and linguistic diversity of Black immigrant children in Chile.

We conducted a secondary data analysis (SDA) (Ruggiano & Perry, 2019) to identify on-the-ground accounts of epistemic violence. SDA usually raises methodological and ethical concerns among qualitative researchers. In relation to methodological concerns, it is important to underscore our deep engagement with the data collection and analysis. Luz participated in different stages of the data collection and preliminary analysis process. Melissa participated in data analysis in the second stage of the study (see Valoyes-Chávez and Andrade-Molina, 2022) and is familiar with the principles and functioning of the PD program. This engagement gave us a clear understanding of the nature and scope of the data collected and the school context in which the process occurred. For this SDA, we considered recordings of eight of Julia's classes in the school year. During Julia's participation in the PD, two classes were videotaped, one class before she started the PD and one class after she finished the PD. Videotaping these classes would help the research team track any changes in Julia's teaching as a result of her participation in the PD. Six additional classes were videotaped while the teacher was implementing the problem-solving instruction. One camera located at the back of the classroom followed Julia and captured her interactions with the students. Each video lasted about 90 min on average.

3.2 Anti-Blackness in Chile

Drawing on our previous discussion, we argue that analyzing practices of silencing and unpacking the resulting damage done to the agency of Black immigrant students as knowers and doers of mathematics in Chilean classrooms is context-dependent and involves shedding light on race relations in Chile. Elsewhere (Valoyes-Chávez & Andrade-Molina, 2022), we have discussed how the invisibility of Blackness in the national history and identity is a fundamental feature of the Chilean racialized system. Blackness has been erased from the national history that has promoted the myth of Chile as a white-*mestizo* country, characterized by a historical European migration that helped to "bring progress and improve the race" by eliminating the supposed animality, savagery, and amorality associated with "the Indigenous" and "the Black" (Tijoux, 2013). This "racial myth" positions Blackness as an "external" and foreign phenomenon that enters through the borders. The new migratory wave from South American and Caribbean countries has brought in Black people. Therefore, being Black in Chile is to be "the other" who does not belong. Blackness, associated with migration and constructed as a stigma (Tijoux, 2013) in the public imaginary, generates an incision in subjectivities that contrasts "the human" and the associated values (rationality, morality, intelligence, civility, maturity, agency) with the "nonhuman" and its attributes (instinct, corporality, amorality, savagery, infantilism, passivity). In this sense, being Black in Chile is a sign of being "nonhuman".

Within the Chilean racial system, Blackness is pathologized as a "discursive formation that embodies the lack of control over bestial impulses, the uncivilized and animal state that leads to considering them as threats to the system and its social welfare" (Andrade-Molina et al., 2022, p. 354). Historical and deeply rooted racial tensions resurfaced as Black immigrant children began to populate public schools in marginalized neighborhoods. Anti-Black violence emerged as everyday practice in the local education system (Riedemann & Stefoni, 2015). Indeed, we have documented how anti-Blackness shapes mathematics education reform efforts in schools attended by Black immigrant children and the limits and pitfalls of discourses of educational inclusion in Chile (Valoyes-Chávez & Andrade-Molina, 2022). Within reform efforts, mechanisms and practices of racial power continue to reinforce the dehumanization of Black immigrant children in school mathematics (Valoyes-Chávez & Darragh, in press). In short, anti-Blackness in Chilean mathematics education research and practice is a critical circumstance for illuminating practices of silencing as instances of epistemic violence against Black immigrant children.

3.3 Analysis of the data

Using the conceptualization of silencing, we watched the videos individually and focused on linguistic interchanges in which mathematical ideas and concepts were discussed. We identified and selected episodes where Julia and the Black immigrant students engaged in mathematics conversations. We also closely observed the teacher's linguistic interactions with non-Black immigrant and Chilean students to contrast and compare. In this first stage of analysis, we sought to understand the linguistic interchanges between Julia and the Black immigrant students.

During the second stage of analysis, we watched the selected episodes and focused on those in which Julia failed to meaningfully engage in the linguistic interchange with one or more Black immigrant children. We intended to test our comprehension of a "failed linguistic interchange" so we focused on Julia's responses in these episodes. For

instance, we observed interactions in which Julia disregarded a Black child's answer to a question or problem she had posed to the class even though the response was correct. In other linguistic interactions, Julia seemed to make no effort to understand the mathematics procedure or explanation offered by a Black child in response to a problem or question. We compared the episodes and agreed on those where it was possible to identify an explicit "refusal to listen" by Julia. In the final stage of our data analysis, we had to ensure that the selected episodes met the three criteria to be considered a practice of silencing. We examined whether each failed teacher-student linguistic interchange was a systemic, repetitive practice and identified the damage to the Black students' agency and credibility as knowers and doers of mathematics. We identified three practices of silencing: *Implausible Communication, Unresponsive Communication*, and *Smothering Communication.*

4 Practices of silencing in the Mathematics Classroom

Below, we present the results.

4.1 Silencing as Implausible Communication

Silencing as Implausible Communication occurred when the Black students tried to explain a procedure or their mathematics thinking and Julia failed to engage with their explanations and arguments. Systematically, Julia would refrain from engaging with the Black immigrant children's explanations and arguments. In some episodes, the students even tried to provide a detailed step-by-step explanation in response to a problem or question only to be met with Julia's lack of effort to make sense of such an explanation. The central aspect involved in the failed linguistic interchange is Julia's minimization of the students' mathematical contributions by portraying them as "gibberish" (*chamullo* in Chilean Spanish). The teacher's actions invalidate the Black immigrant students' mathematical thinking and mathematics procedures. For example, in one episode, Julia presents a problem to the group that involves subtracting 109 from 300. While Bastian, a Chilean white-*mestizo* student, tries to do the subtraction on the whiteboard, Julia checks to see what Robert is doing. The following linguistic interchange occurs:

> Julia: [Looking at Roberts' worksheet] It is not 201! [She leaves] *That is only gibberish!* [She comes back, holds Roberts' pencil, and starts writing] Let's see, 9 + 1 equals…
> Robert: Ten. [He pauses] Zero! [answering on the placement of the number 0 in 10]
> Julia: Good. [She pauses] One? [writing the placement of 1 in 10] Yes or no?
> Robert: Zero!
> Julia: [Still holding Robert's pen and writing in his notebook] No! It is one! 2 + 1. It is not 25, as you said, and it is not 201, either. Check it out! [She writes the numbers on the problem again]
> [Robert looks at Julia while she is solving the problem. Meanwhile, Bastian is unable to solve the problem on the whiteboard; he tries to get Julia's attention, but she is busy solving the problem for Robert.]

Julia refuses to acknowledge the Black immigrant students' responses. She dismisses them by portraying their mathematics productions as indecipherable and incomprehensible, closing the opportunity for Black immigrant students to be recognized as credible mathematical knowers. In another episode, the students are individually solving problems that involve subtraction with borrowing. Robert seems confused and asks Julia for help:

> Julia: Why did you do that, Robert? It says… [Looking at Robert's sheet and raising her voice] Look at the number here and there! *What is this gibberish?*
> Robert: So, how is it?
> Julia: *Gibberish!* [She leaves].

Clearly, Robert did not understand the problem. The teacher looked at his work progress, and instead of engaging in a dialogue about Robert's answer, she told him it was all gibberish and continued by reading the problem one more time aloud to Robert. Later in the episode, she realizes that Robert is decomposing the numbers when he should be following the rules of subtraction with borrowing. The teacher tells Robert: "Nobody told you to decompose this. Nobody! We are just going to see it. So, gibberish. Gibberish!". She noticed that Robert was ahead of the assignment because he was using a method she was about to teach. However, she did not use this opportunity to validate Robert's mathematical knowledge and thinking; instead, Julia disregarded his contribution and ridiculed him in front of the class (a regular practice with Robert).

The teacher's perception that the Black child cannot properly communicate in mathematics terms damages their credibility as producers of mathematics knowledge. By portraying the Black students' mathematical production as "gibberish" and a mess, Implausible Communication as a practice of silencing allows the positioning of the Black child as "incapable of producing any legitimate language" (Rosa, 2016, p. 163) in the mathematics classroom. The

Black child is thus positioned as a languageless student. This positioning emerges in line with what Rosa (2016) calls racialized ideologies of languagelessness which "call into question linguistic competence—and, by extension, legitimate personhood—altogether" (p. 163).

4.2 Silencing as unresponsive communication

Silencing as Unresponsive Communication occurred when the Black students tried to respond to a question posed by Julia to the whole class or the small groups; however, such responses went unnoticed and unrecognized by the teacher. By refusing to acknowledge the Black immigrant students' contributions to the collective mathematical discussion, the children are positioned as unreliable knowers and doers of mathematical knowledge. For example, in the following episode, Julia fails to include Robert and Andrés in the whole class discussion:

Julia: How many units and tens are in the number 12?

[Andrés gets up from his desk and raises his hand. Julia looks at him, turns her body towards the whiteboard, and continues talking].

Julia: It says….

Robert: [Interrupting Julia] I know the answer, Tía! I know it!

Julia: Moment! [Ignoring Robert] How many units are there? [She is now looking at the whole class. Andrés is the only student with his hand up. He has kept his hand up waiting to be called]. Let's see who can come to the whiteboard…You, Martha, come and write the answer [Andrés lowers his hand].

Julia also fails to recognize the Black students' mathematical contributions when working in small groups. For example, in one episode Robert, Ana, and two white-*mestizo* Chilean students are working to solve a problem. Julia approaches the group, and the following linguistic interchange takes place:

> Julia: What did I say about the task? [She raises her voice] Let's see what needs to be done for the task. Can anybody from this group tell me? No? You! [pointing to Robert]. Because you are talking. What needs to be done?
> Robert: We need to add.
> Julia: [After a pause] What do you have to add? [She leaves]
> [Robert covers his face with both hands and looks down. Then, he continued talking to their peers]

In this episode, Julia does not validate Robert's contribution. Indeed, Robert gave the right strategy to solve the problem, but Julia did not build on his answer to help the students solve the problem. A learning opportunity for the group is lost. These linguistic interactions contrast with Julia's interactions with the white-*mestizo* students. For them, Julia demonstrates a positive attitude and helps them find ways to solve a problem.

Often, silencing as Unresponsive Communication also renders invisible the Black immigrant students themselves while trying to contribute to the mathematics discussion. Julia fails to acknowledge the Black students' mathematical contributions and turns a blind eye to them. For instance, in one episode, Patty, a Chilean white-*mestiza* girl, and Simon, a white-*mestizo* immigrant boy from Bolivia, are working to solve a problem with Dago and Jenny. Julia approaches the group, and the following linguistic interchange takes place:

> Julia: [looking at Patty's worksheet]. Ok. You divided here, didn't you? [pointing to Patty's worksheet].
> Patty: Yes, I did.
> [Jenny holds her worksheet in her hand. She kneels on her chair while Patty remains seated. In this position, Jenny's body is more visible than Patty's. It is impossible not to see her. Simon and Dago remained silent, watching the interactions].
> Julia: But now I have to put it in the box.
> [The teacher leans toward Patty and uses a pencil to signal her explanation. Jenny still holds the worksheet and attempts to show it to Julia. She quietly talks and tries to catch Julia's attention].
> Jenny: Tía, look, Tía!
> [Julia takes a quick look at Jenny's worksheet, looks down, and keeps conversing with Patty. Jenny holds her worksheet in front of Julia's face, but she ignores her and continues the conversation with Patty].
> Julia: So, what would be a box here?
> Patty: All that?
> [Julia makes a gesture of approval with her head. Jenny still has her worksheet in front of Julia's face].
> Dago: [interrupting the conversation and loudly addressing Julia]. Tia, Patty must go to the whiteboard.
> [Julia glances sideways at Dago and quickly returns her look at Patty and her worksheet].
> Julia: Ok. Do it.

In this linguistic interchange, Julia only validates the procedures of Patty while Jenny's attempts to engage in the conversation are entirely ignored. Each time Jenny tries to intervene to show her work to Julia, she is rendered invisible by the teacher. As Jenny insists and refuses to be ignored, Julia tells her to wait but never looks at her or her work. Jenny's group is asked to explain what they did to the class

during the plenary. Even at that moment, Julia fails to recognize Jenny's contributions, who worked side-by-side with Patty:

> Julia: Patty *did* something different. Come on, Patty, go ahead!
> [Jenny stands up and helps Patty with the worksheets. Patty struggles to understand what she is supposed to say to the class. Jenny organizes their sheets and materials and tries to join Patty, but Julia repeats the instruction]:
> Julia: Ok. What did you do? You did that [pointing at Patty's sheet] So, write it. [Shushes the class] Please, look at what Patty did.
> [Jenny takes the material they have used to solve the problem and hands them to Patty. She seems confused. Julia moves close to Patty, walks around Jenny without making any visual contact, and takes the worksheet. Jenny sits down and plays with her worksheet].
> Patty: We divided.
> Julia: WE divided [stressing the "we"]. How interesting! How did YOU divide, Miss Patty? [The teacher keeps correcting Patty whenever she says "we" to the singular form of you].

In this practice of silencing, what Pinto (2017) calls epistemic invisibility occurs. Unresponsive Communication gives prominence to the voices, the mathematics practices, and cognitive resources of some students (white-*mestizo* and non-Black immigrant children) while the Black children's voices, mathematics practices, and cognitive resources are silenced. Moreover, the Black children themselves are rendered invisible. Pinto argues that this epistemic invisibility hinders the process itself, and epistemic violence "renews itself in the face of the apparent inexhaustibility of its object" (Pinto, 2017, p. 180). The Black immigrant child is present but unseen and becomes interminably spectral in the mathematics classroom.

4.3 Silencing as Smothering Communication

Silencing as Smothering Communication occurs when the Black students try to provide a breakdown or detailed step-by-step explanation of how they performed a mathematics procedure or solved a problem, and Julia fails to recognize such explanations. In this case, the teacher systematically doubts the students' procedures. In an episode, the students work individually on a worksheet Julia had previously handed in. Andrés is one of the first students to finish and shows his answer to Julia:

> [Andrés hands his worksheet to Julia. He puts his hands in a prayer position covering his mouth]

Julia: [Mockingly surprised] Where did you get this, Andrés?

Andrés: [Reaching his work from the teacher] Nah!

Julia: You must. [She pauses] I mean [now speaking to the whole class], listen to the problem [reads the problem again].

The episode continues with one white-*mestiza* girl showing her answer to Julia. Julia replies to her politely, "Now write on the side what you did. Did you add, subtract, multiply, or divide? And all those things". However, when it comes to interacting with Andrés, Julia's instructions change:

> Andrés: [Walking towards the teacher] Tía! In this, there are 44.
> Julia: [Looking at the sheet] Honey, the question is [reads the problem's question harshly, pausing after each word] How can you know?
> Andrés: I know! It is [calculating mentally] five thousand…
> Julia: [Interrupting Andrés] Ok, sit down [she lightly pushes Andrés toward his desk].
> Andrés: [Solving the problem while he walks and sits down] Tía, I've learned!
> Julia: Ok. What is the answer?
> Andrés: [Answers the problem] It is 5750.
> Julia: Ok. But how did you get it?
> Andrés: Easy. I counted. I grouped them.
> Julia: Ok! And for grouping, what do you do? [Change to a condescending voice] What do I do when I group? Do I add, subtract, multiply, or divide?
> Andrés: I added
> Julia: Ok. So, now you must explain to me what you did [still with the condescending tone] I added? Did I subtract? Or I multiplied? Or I divided? And here I want to see how you grouped them and how you solved it [she leaves].

In contrast with the interaction with the white-*mestiz*a girl, Julia explicitly instructed Andrés by asking him to explain each step of his procedures. She did not stop asking him to express the operation he used clearly—the instruction for the white-*mestiza* girl—but she commanded him to explicitly describe every step he followed for her to see how he grouped the objects involved in the task and to also explicitly describe how he was able to achieve the answer to the problem.

The Black immigrant students are approached as deficient learners. When Julia fails to recognize Black immigrant

students as producers of mathematics knowledge, she also fails to give them autonomy when solving problems. The failure exemplifies what Fricker (2007) calls epistemic injustice, "a wrong done to someone in their capacity as a knower" (p. 2). In the episodes considered, the Black immigrant students experience this injustice in two ways. First, Julia acts overly protective of their mathematical strategies and ways of being, as if they are incapable of understanding and solving the task. Second, she pushes Black immigrant students to over-explain their procedures as if they could not possibly know what they are doing. Smothering Communication contributes to producing a languageless subject in a racialized body (Pinto, 2017).

5 Beyond Language

This paper draws on Dotson's (2011) work to identify on-the-ground accounts of epistemic violence against Black immigrant children in mathematics classrooms. In particular, our interest was to account for practices of silencing during teacher-student linguistic interchanges. Three elements are crucial to identifying practices of silencing in mathematics classrooms: The existence of reliable ignorance, the damage done to the student's epistemic agency and credibility, and the systematic and repetitive nature of the practice. A focus on the practices of silencing as enacted forms of epistemic violence allows us to unpack how the Black immigrant child is divested of their epistemic agency during communicative acts in the mathematics classroom. Silencing can be characterized as a systemic, repetitive practice caused by a reliable and identifiable ignorance that damages students' epistemic agency and credibility as doer and knower of mathematics. Our study documents this form of violence in the math classroom and shows how silencing works in different types of linguistic interactions between teachers and students: From one-on-one teacher-student interactions to teacher-whole-group and small-group interactions.

5.1 Anti-Blackness and white ignorance in Mathematics Classrooms

While characterizing his notion of "White ignorance", Mills (2007) affirms that perception is a socialized function and, to understand how it works, it is critical to locate the perceiving agent in "her [sic] specificity as a member of certain social groups, within a given social milieu, in a society at a particular time period" (p. 14). Both Dotson (2011) and Fricker (2007) underscore the role of prejudice and stereotypes in the speaker's chances to be positioned as a reliable and credible source of knowledge. Our analysis provides evidence that, as a perceiving agent, the teacher's credibility judgments on the Black immigrant children are mediated and shaped by anti-Blackness and the dominant racial ideologies in Chile. First, Julia's positioning as part of the privileged racial group in Chile plays a fundamental role in shaping her perceptions of Black students in linguistic interchanges. Her judgments of these students' credibility as doers and knowers of mathematics can be understood as the result of her perceptions as a white-*mestiza* persona in the Chilean racialized system where Blackness is associated to savagery, uncivility, and ignorance (Valoyes-Chávez & Darragh, in press). Second, as we discussed before, anti-Blackness is at the center of racial relations in this country. Moreover, the invisibilization of Black immigrant students in the mathematics classrooms seems to resemble the historical invisibilization of Blackness in Chilean history and national identity. The refusal to "see" (in the sense of recognizing) the Black immigrant children in linguistic interchanges is, as Mills (2007) argues, "a primary epistemic principle" according to which Black people are not seen at all. Thus, the teacher's racialized hegemonic perceptions play a central role in the failure of reciprocal communication in mathematics classrooms, hurting Black students' ability to speak, be heard, and be seen.

Our study shows that reciprocity in mathematics communication is strongly tied to the teacher's "perception" of the Black student in communicative acts. Reciprocity is thus a central aspect to understanding how epistemic violence works, as it exposes both white ignorance and white blindness in the mathematics classroom and the Black immigrant students' vulnerability in linguistic exchanges. Anti-Blackness, as a structuring element of mathematics teaching and learning practices, undermines the credibility and agency of Black students as doers and knowers of mathematics. To judge the Black student's credibility as a mathematics knower, such "perception" may target not only linguistic signs in spoken language but also different modes of communication and broader semiotic forms such as physical features and bodily comportment, among others (Rosa & Flores, 2017).

5.2 Invisibilization, silencing, and onto-epistemic violence in Mathematics Classrooms

When exerted over entire student populations, epistemic violence not only damages the group's ability to speak, be listened to, and be heard. It also eliminates and hinders their knowledge, epistemic practices, and resources. At the individual level, epistemic violence harms the Black child's agency and credibility as a knower and doer of mathematics. Epistemic violence is, therefore, a central element in the unequal distribution of intelligibility among students from different social groups (Brunner, 2021) and, as Dotson

(2011) affirms, "in instances such as these [where epistemically disadvantaged identities produce ignorance] it is not simply facts, events, practices, or technologies that are rendered not known, but individuals and groups who are rendered 'not knowers'" (p. 243). We want to highlight the subjective and material consequences of the epistemic violence exerted on Black immigrant children in mathematics classrooms. Not only do the practices of silencing damage their agency and credibility as mathematics knowers, but they also contribute to their fabrication as "particular mathematics learners". As Martin et al. (2019) have argued, Black children—including those of immigrant origin—are subjected to various forms of violence. Dominant discourses in the field portray this student population as broken learners in constant need of intervention. This form of violence discursively produced is central to the processes of subject formation and thus embodies epistemic and ontic elements that produce the knowing subject (Chronaki et al., 2022). Our study shows that silencing, as a form of epistemic violence, contributes to fabricating the Black child as a disadvantaged and underperforming mathematics learner. Consequently, Black people, as part of an epistemically disadvantaged identity, participate unequally in the practices that produce meaning in mathematics and mathematics education.

The imbrication of the ontic and epistemic elements in the practices that silence Black immigrant children in school mathematics emerges as a critical aspect to expand the knowledge on the role of epistemic violence in the fabrication of disadvantaged mathematics identities. Our study shows that silencing produces invisible bodies in mathematics classrooms. In Valoyes-Chávez and Darragh (in press), invisibilization is defined as a technology of race power that contributes to fabricating the Black immigrant children in Chile as outsiders and invisible members in the mathematics classrooms and society. In mathematics classrooms attended by this student population, the problematization of language should transcend issues of linguistic diversity to encompass the examination of its role in the differentiation of bodies along racial, class, gender, and ethnic lines. Such consideration could offer a new perspective to critically investigate the significance of race and racialization in shaping immigrant students' learning, communication, and participation in mathematics classrooms. Moreover, we must acknowledge that epistemic violence creates specific student subjectivities hierarchically positioned within the mathematics classroom. This is, then, a form of onto-epistemic violence because, as Chronaki et al. (2022) affirm, it "retains both an ontic and epistemic nature as it is discursively reproduced through knowledge (including mathematics), becomes ethnically embodied in our everyday encounters, and in turn produces the knowing subject in academic and educational contexts" (p. 111). The onto-epistemic, constituted by qualities of ontology and epistemology, concerns with the legacies of colonialism of "knowledge, power, and being [which administrate] the culture, labor, intersubjective relation, and knowledge production well beyond the limits of colonialism" (Zhao et al., 2022, p. 3) to create the racialized Other. This interplay between the onto and epistemic dimensions in the mathematics classroom emerges as a critical aspect in our study and deserves further examination in the field.

5.3 Beyond Language

A fundamental aspect to consider when analyzing practices of silencing in mathematics classrooms is the distinctive anti-Black character of mathematics education and its functioning as a white institutional space (Martin, 2019). Indeed, we draw on the assumption that "race should be placed front and center in considerations of political violence" (Weheliye, 2014, p. 5) and thus locate racialization at the center of epistemic violence in ethnically and racially diverse mathematics classrooms. Racialization is understood as "the conglomerate of sociopolitical relations that discipline humanity into full humans, not-quite humans and nonhumans" (Weheliye, 2014, p. 3). Language is one of the mechanisms through which this conglomerate operates to divest non-white people of their humanity, emerging as a critical aspect for understanding the interconnectedness of systemic forms of violence, racialization, and the fabrication of subjectivities. Pinto (2017) argues that "language is a key element in the processes of gendering, racialization, sexualization, and other differentiations that bodies are exposed to, and these processes are articulated with the formation of identities" (p. 180). This acknowledgment provides an alternative path to examine the mathematical experiences of immigrant students.

Various studies (e.g., Barwell, 2018; Setati, 2005) have shed light on the interplay between language and power in the immigrant students' participation, access, and positioning during mathematics teaching and learning. Nevertheless, in mathematics education research primarily conducted in Europe (e.g., Halai and Clarkson, 2016; Noren & Svensson, 2018), immigrant children are portrayed as "multilingual students", a positioning that ends up reducing the experiences of students from different ethnic, national, and racial backgrounds to "language issues". Framed in a neutral approach to language, the notion of multilingualism functions as a mechanism to homogenize and essentialize immigrant children and serves to conceal the role of racialization (and anti-Blackness) in their fabrication as deficient mathematics learners. Although scholars have characterized mathematics education as a white institutional space framed by "white practices" and "white logics" (Martin, 2019),

research about immigrant students continues to ignore processes of racialization in linguistically diverse school contexts. Our paper illustrates how the study of issues of language in linguistically and culturally diverse school contexts must include an analysis of racialization, and specifically the functioning of anti-Blackness, as a distinctive factor that shapes teacher-student interactions in ways that prevent members of different racial, cultural, and ethnic groups from interacting epistemically in meaningful ways.

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