LEARNER, STUDENT, MATHEMATICIAN: WHAT WE CALL THE SUBJECTS OF MATHEMATICS EDUCATION

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ABSTRACT

The terms learner, student, and mathematician are not neutral language that describe objective reality. Instead, these words, like all language, invite the speaker and a hearer to share in a common *sense* of the world. In this philosophical pondering on the language that researchers in mathematics use to refer to the subjects of mathematics education (i.e., learners, students, mathematicians), I begin to identify how this language is presumptive of either inequality (in the case of learner and student) or equality (in the case of mathematician). Mathematician, however, is not univocal in its meaning, instead there are two distinct ways that mathematician has been used: one as *any* knower and doer of mathematics and the other as people doing research in mathematics itself. I provide a genealogical discussion of mathematician, showing roots of both meanings among the ancient Greeks, with the former, broader sense rooted in the work of Aristotle while the later, more specialized sense is rooted in the Pythagorean tradition. Which legacy of the term mathematician should mathematics education researchers champion? The philosophical work of Jacques Rancière is central to the ways in which (in)equality is used here to interrogate the for-granted status of the terms and use of learner, student, and mathematician within research in mathematics education.

Keywords: Learner; Student; Mathematician; Equality; Jacques Rancière; Aristotle; Pythagoras; Genealogy; Researching Research

> "When we refer to those who are the subjects of education as 'learners' we immediately put them in a position where they still have to learn and where their learning is considered to be dependent upon our explanation...When we refer to those who are the subjects of education as 'students', we start from the assumption that they can learn without our explanations, without the need for educational 'respiration'" (Biesta, 2010, p. 548).

The terms learner, student, and mathematician are not neutral language that describe objective reality. Instead, these words, like all language, invite the speaker and a hearer to share in a common *sense* of the world (Rancière, 2009). In this philosophical pondering on the language that researchers in mathematics education use to refer to the subjects of mathematics education (i.e., learners, students, mathematicians), I begin to identify how this language is presumptive of either inequality (in the case of learner and student; Biesta, 2010) or equality (in the case of mathematician). Mathematician, however, is not univocal in its meaning, instead there are two distinct ways that mathematician has been used: one as *any* knower and doer of mathematics and the other as people

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Biesta (2010) has taken up Rancière's notion of equality and elaborated the assumptions implicit in referring to the subjects of education as learners, students, and speakers. On one hand, *learner* presumes a lack, a deficiency in knowledge that is to be remedied by the teacher. *Student*, on the other hand, presupposes the student is one that can study, is active in the learning process. Alternatively, *speaker* presumes the ability of the subjects of education to speak as an equal, as one that was always already capable of speaking (Biesta, 2010). Analogous to Biesta's speaker, I argue for the use of *mathematician* to refer to the subjects of mathematics education, as it frames those subjects as *always already* capable of participating in and contributing to mathematical discussions and doing mathematics[1]. Similar movements are already beginning in other content areas such as art (all students are artists; Nathan, 2012), English language arts (all students are readers and writers; Vetter, 2010), and music (all students are musicians; Roberts, 1993).

In this paper, I begin by introducing Biesta's reading of Rancière to unpack a particular understanding of (in)equality inherent in the language used to refer to the subjects of mathematics education. Then, I consider two possible meanings of *mathematician* before (1) discussing how the literature published in the *Journal for Research in Mathematics Education, Educational Studies in Mathematics,* and *For the Learning of Mathematics* since 2010 has positioned the subjects of mathematics education as students, learners, or mathematicians refers to the subjects of mathematics education, (2) illuminating what implicit assumptions the choice of language brings to research, and (3) offering possible futures/alternatives which figures the subjects of mathematics education as mathematicians.

Learner, Student, Speaker: Biesta Reads Rancière

> "The main point is not what [words] explain or express, it is the way in which they stage a scene or they create a commonsense: things that the speaker and those that hear it are invited to share—as a spectacle, a feeling, a phrasing, a mode of intelligibility" (Rancière, 2009, p. 117).

As Jacques Rancière suggested in this epigraph, words are central to the ways in which people make sense of the world around us. In particular, the words and language used invite both the speaker and hearers to create a shared meaning and understanding of their context (Charteris-Black, 2004). In this way, then, the use of learner or student to refer to the subjects of mathematics education invites the hearer to hold, if only tentatively, a particular concept image of the learner/student and their capabilities. The choice of language is constrained, though not fully determined, by the context in which it is used. For example, Halliday (1978) introduces a distinction between natural language used for everyday communication and the *mathematical register*, a specialized 'version' of language which is used to discuss mathematical ideas with particular precision, in particular ways. While a hierarchical

[1] This is not to say, however, that all people have the same knowledge. Certainly there is a difference in what mathematician-students know and what their mathematician-teachers know.

formulation of language is potentially problematic, there is no denying that proper use of the mathematics, or statistics, register is a particular sign of legitimate participation in the community of mathematicians/statisticians (Lave & Wenger, 1991). Next, after introducing Rancière's particular reading of pedagogy, I will discuss the ways in which educational philosopher Gert Biesta (2005) has unpacked the language surrounding learning and studenthood. Biesta's framing will serve as the lens that I will bring to the literature, to identify how researchers have named their subjects.

Assuming Inequality and Incapacity: Rancière Names Stultifying Pedagogy

Jacques Rancière is a French political philosopher whose research centers on the politics of (in)equality (1991, 1999, 2004, 2013). His work, notably *The Ignorant Schoolmaster*, challenges the for granted assumptions of education and explicative pedagogy, challenging pedagogy which supposes that students are in need of explanation in order to understand. Rancière's breakthrough is grounded in his discussion of the work of Joseph Jacotot, a French college instructor whose students spoke no French, only Flemish. As Jacotot knew no Flemish, he gave to his students French and Flemish versions of Fénelon's *The Adventures of Telemachus* (1699): a later addition to Homer's *Odyssey*, discussing the education of Telemachus, son of Ulysses. With the help of an interpreter, Jacotot asked his students to study the two editions of the book and repeat aloud what they had read. He had them read and re-read the text until they could recite it from memory. At the end of the semester, Jacotot asked the students to compose an essay in French on their thoughts about what they had read; the students had written essays comparable to those written by native speakers.

This tale is not, however, one of the exceptionality of Jacotot's students, nor the uniqueness of language acquisition, but rather one of the potential for anyone to learn anything without being taught (Jacotot did not *teach* but the students had indeed learned) and the ability for one to teach even what one does not know. The example of Jacotot disentangles *will* from *intellect* in pedagogical assumptions: one can teach by requiring that the student *speak*, that they demonstrate their intelligence; the student need not be subordinated to the knowledge of the teacher. Rancière's political activism consists in juxtaposing two events to reveal what assumptions have become implicit and for-granted, to propose alternatives. I juxtapose the political theory of Jacques Rancière with mathematics education research to bring to light the ways in which (in)equality is presupposed in the language used to discuss the subjects[2] of mathematics education.

Rancière uses the term *explicate* to identify the quintessential component of stultifying pedagogy: a teacher must reveal the meaning of what is being taught. It is presumed, in *stultifying pedagogy*, that the student is incapable of accessing the ideas without the carefully crafted explication of the teacher. The 'real' meaning of the ideas and their relationships with one another are opaque; it is through the carefully crafted and sequenced explanations that the teacher enables the student to understand, to know. In other words, there is an assumed inequality between the capacities of the teacher and the student: since the teacher has already been explicated to, they can explicate to their students—without this explication the student cannot understand. "Understanding is what the child cannot do without the explanations of a master" (Rancière, 1991, p. 6), yet, the sole judge of the teacher's own understanding was their prior explicator, just as they will act as the judge of whether their students have been successfully explicated to, or in other words, have come to understand.

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[2] I use *subject* as an umbrella term for those whom might have previously been referred to as learners or students; this is a nod to both Foucault (1982) and Rancière.

The logic of explication is regressive: how might we know if a teacher's explication is sufficient? Might the teacher fail and need another explicator to step in? And this explicator, another? This constitutes the regressive explicative logic as described by Jacques Rancière (1991, 2013; Biesta, 2010). Explicative logic assumes there is both an extensiveness and progressiveness to pedagogy. On one hand, the body of knowledge to be understood—in the present analysis, this is synonymous with any particular mathematical concept—is sufficiently extensive that the student blindly grasping with its ideas could never come to see it in its entirety: at best, the student would grasp disjoint and limited pieces. On the other, the body of knowledge itself is assumed to be sufficiently complex and ordered that without the progressive exposure curated by the teacher, a student would be lost, would be unable to progress in understanding the body of knowledge without a guide: their teacher.

Extensiveness and progressiveness together establish a hierarchy of intelligence: the teacher having already covered the breadth of the body of knowledge, in the correct sequence through their own learning, are capable of facilitating the student to come to understand. In other words, left to their own devices, students will develop misconceptions or limited understandings. This explicative logic, or the *myth* of pedagogy, is responsible for the learning of stultification: the student cannot learn without a master explicator, a teacher. It is the double-gesture of the teacher to cast a veil over the body of knowledge and to then lift the veil as they see fit (Rancière, 1991). Pedagogy, then, fundamentally transmits knowledge of an *incapacity to know without pedagogy*. Pedagogy epistemically privileges the teacher and their methods to the methods of the child: engagement, imitation, repetition. These methods are those which the child uses to learn their first language; no teacher explicates the rules of grammar and phonology to the child (prior to the formalization of language in elementary school): they hear, they imitate, they repeat (Rancière, 1991).

It is important, here, to explicitly take a stance on the role of the teacher: I am not interested in abolishing the role of the teacher (nor does Biesta; 2017). Instead, I wish to trouble the assumption that a notion of *teacher* that presumes an inequality between teacher and student is a *necessary* assumption. Indeed, my position is that the language of learner and student perpetuates an inequality between the teacher and student whereas the term 'mathematician' begins from an *assumption* of equality. This is not to say that a master explicator is not efficient, the pedagogue establishes an (easily measured) progression through which knowledge is constructed and elaborated. But, as Rancière and Biesta argue, the assumption that a one cannot learn without explication often accompanies the practice of master explicators[3]. I turn now to a further unpacking of the language of learning before turning explicitly to research in mathematics education.

Learner, Student, Speaker: Biesta Unpacks the Language of Learning

In "Against Learning," Biesta (2005) traces the emergence of the language of learning—students as learners, adult learning, lifelong learning, etc.—which has supplanted the language of education (e.g., educators, adult education). While I will adopt a stance that *learner* is a deficit framing of the subjects of education, I do not reject this language outright. The language of learning has enabled a shift in focus from the role of the teacher-educator as the central and dominant force in a classroom to a

[3] Rancière explicitly discusses the so-called progressive pedagogy of Rousseau in *The Ignorant Schoolmaster*. There is a dishonesty and inequality inherent in the 'obstacle course' constructed by the progressive pedagogue; discussing the details of this is beyond the scope of this paper.

shift in focusing on the individual students, their individual knowledge and learning. Biesta argues that this shift in language has taken place in part because of learning theories which reject the transmission model of teaching/learning (e.g., Lave & Wenger's sociocultural learning theory; 1991), due to the proliferation of self-learning (e.g., self-help books, fitness books, etc.), and, in part, because of postmodernism's doubt of the Enlightenment dream: emancipation through rational understanding.

Biesta (2010) has taken up Rancière's notion of equality, using the lens of stultifying pedagogy, to illuminate the implicit assumptions in referring to the subjects of education as learners, students, and speakers. On one hand, *learner* presumes a lack, a deficiency in knowledge and capacity that is to be remedied by the teacher. Leaner perpetuates the pedagogical myth, the stultifying claim that a learner does not know, and cannot come to know, without the explications of an explicative teacher.

Student, on the other hand, presupposes the student is one that can study, is active in the learning process. Unlike learner, which is inextricable from a discussion of knowledge—learner requires a missing knowledge to be learned—*student* can be framed in terms of will. The student is already capable of studying, of coming to know, but may not desire to do so, their *will* may be lacking. The role of the teacher with students is to demand that students engage with material. The teacher asks "What do you see? What do you think about it? What do you make of it?" (Rancière, 1999, p. 23) and the student rises to the occasion, demonstrates their ability, and responds.

Alternatively, *speaker* presumes the ability of the subjects of education to speak as an equal, as one that was always already capable of speaking. The distinction between noise and voice, between unintelligible mutterings and the ordered rationality of proper (mathematical) language use is purely aesthetic, is a matter of a particular distribution of the sensible (de Freitas, 2010; Rancière, 1999). In other words, what counts as proper *math-speak* is a matter of taste (as in a particular taste of music or art), the judge of proper and improper use of language is the teacher, and their classification is dependent on the current shared understanding from mathematics education research. One can point to the growing acceptance of computer-assisted proof among research mathematicians as one such shift in taste (e.g., the proof of the four-color conjecture which exhaustively considers all the reduced cases); shifts in language are likewise a matter of preference (e.g., a choral "four and four are eight" of yesteryear versus the "four plus four equals eight" that is more common today). Analogous to Biesta's speaker, I argue for the use of *mathematician* to refer to the subjects of mathematics education, as it frames those subjects as always already capable of participating in and contributing to mathematical discussions. My use of mathematician more broadly than "someone that engages in mathematical research" is not idiosyncratic, instead I next trace two distinct uses of *mathematician* to the Greek philosopher-mathematicians Pythagoras and Aristotle.

Mathēmatikós: On Two Meanings of Mathematician

Mathematician, while often used as though it has a singular meaning, is a divergent term that has a polyphony of meaning. In one usage, mathematician is used to refer to those with a Ph.D. in mathematics whose career it is to research advanced mathematics and to teach at the college level (e.g., Beckmann, 2011; Burton, 1999; Davis & Hersh, 1998). In another, mathematician is used to refer to a doer of mathematics, as anyone with mathematical understanding that can apply mathematical concepts to appropriate contexts (e.g., Brilliant-Mills, 1994; Fosnot & Dolk, 2001; Grabiner, 1975).

The two meanings of mathematician can be traced to the Greek word mathēmatikós (μᾰθημᾰτῐκός). As a noun, *mathēmatikós* was used to refer to either the advanced students of Pythagoras with a full understanding of the reasoning behind his mathematical thought (Iamblichus, 1818; Porphyry, 1920) or to anyone that knows and does mathematics (Aristotle, 2015). To elaborate, mathēmatikós in its most general sense can be interpreted as "fond of learning" (Liddell & Scott, 1940) as mathēma is generally "something that is learned, a lesson" while the suffix –tikós denotes one of "related to, skilled in, able to"; it is in this suffix that the meanings of mathēmatikós begin to diverge. It is in particular usages of *mathēmatikós*, distinguished by context, that mathēma denotes the mathematical sciences specifically. The two usages of mathematician, one exclusive and the other more universal, have origins in the work of the Pythagoreans in the former and Aristotle in the latter.

Pythagorean mathēmatikós

The Pythagoreans were a religious and intellectual community that studied the beliefs and thought of Pythagoras (Iamblichus, 1818). The Pythagoreans lived communally with shared possessions but individual property. Together, they sought a common education consisting of studying Pythagorean thought. According to Porphyry (1920), communities of Pythagoreans were divided into two kinds: the *mathematici* (μᾰθημᾰτῐκός) and the *acusmatici* (ἀκουσματικος [acousmatikos], from the same root as *acoustic*, meaning followers of the oral tradition). The former group, the mathematici, were universally recognized as Pythagoreans while the mathematici did not recognize the acusmatici as Pythagoreans. The distinguishing characteristic was that the mathematici studied the works—or lessons (mathēma)—of Pythagoras directly, with special attention to the reasonings behind Pythagoras' mathematical thought, whereas the acusmatici studied an interpretation of Pythagoras' works by Hippasus. The exclusionary notion of *mathematici* is echoed in Davis and Hersh's description of the so-called "ideal mathematician" in *New directions in the philosophy of mathematics* (1998), where the mathematician must "go through an arduous apprenticeship of several years to understand the theory to which he is devoted" (p. 178).

In the mathematics education special issue of the Notices of the American Mathematical Society (2011), the numerous authors each use mathematician in this more limited, Pythagorean, sense. That is, mathematicians are "individuals in mathematics departments at colleges and universities who teach mathematics courses and who have done research in math" (Beckmann, 2011). This latter qualification, having done research in mathematics, is shared across the authors in the AMS special issue (e.g., Fendel, 2011; Papick, 2011; Wu, 2011). While these authors argue for a special role of the research mathematician in mathematics education, Heaton and Lewis (2011) argue explicitly for a closer partnership between mathematicians in mathematics departments and mathematics educators in teacher education departments (Lewis is a mathematician and Heaton and mathematics educator); a perspective which aligns with my own.

Aristotelian mathēmatikós

Unlike the Pythagorean use of mathēmatikós, Aristotle used mathematician in a more general sense. In his *Nicomachean Ethics*, Aristotle (2015) characterizes the nature of mathematical thought and objects before beginning a discussion on the capacity for individuals to learn mathematics, a so-called abstract science, and the natural sciences (e.g., physics). His distinguishing feature for the nature of the learning of these two kinds of science is that while mathematics is axiomatic, built upon first principles, with the use of a particular logico-deductive reasoning, physics is the study of experience in the natural world, experiences that children may not have had and must take for-granted from their teachers. From this, Aristotle argues, that there is no difference between individuals *in capacity* to learn mathematics (parallel to Rancière; 1991) and anyone that knows and can do mathematics is called mathematician (mathēmatikós).

Aristotle's more liberal usage of mathematician, as any knower or doer of mathematics, lives today in situative perspectives on mathematics education (Putnam & Borko, 2000), where being a mathematician is understood as an idea that is locally constructed within a classroom between students and teachers in how they talk about knowing and doing mathematics (Brilliant-Mills, 1994). For situativists, "situated social and discursive practices and texts shape what members of [a classroom] (alone and together) do with and understand about mathematics as a body of knowledge and as a discipline of social practices of a group called mathematicians" (Brilliant-Mills, 1994, p. 304) in that specific classroom context. In her findings, Brilliant-Mills found that teachers and students constructed mathematician to mean thinkers and doers of mathematics, "to ask particular questions, to use particular patters in enquiry, to use [mathematical] knowledge about the world in particular ways for particular purposes" (p. 328). This usage is likewise used by Fosnot and Dolk (2001) in their trilogy *Young Mathematicians at Work*, which focuses on the mathematical brilliance of young children and elevates the knowing and doing of mathematics by children, instead of subordinating it to the 'advanced' knowledge of research mathematicians.

The two meanings of mathematician are incommensurable: one position is that any knower and doer of mathematics is a mathematician while the second is that mathematician should be reserved for researchers of mathematics. Considering Rancière's perspective, which helps to illuminate inequality implicit in language, the former meaning begins form the assumption of equality, all can know and do mathematics. In contrast, the reservation of mathematician as only applicable to research mathematicians requires a presupposition of inequality: the so-called *advanced* mathematicians are only distinguishable in reference to a group that does not know, that cannot understand their specialized research.

Who Are the Mathematicians? Subjects of Mathematics Education

The present analysis uses a standpoint on language, Rancière's perspective on (in)equality, and Biesta's reading of Rancière to investigate how researchers in mathematics education have referred to the subjects of mathematics education. Borrowing Biesta's philosophical approach to the study of language in use, I sought to investigate how researchers in mathematics education have referred to the subjects of mathematics education, be it as learners, students, or mathematicians. Furthermore, the dual meanings of mathematician pairs well with Rancière's radical equality in which the Pythagorean use of mathematician can be viewed as a way of presuming inequality while the Aristotelian use is linguistically more equitable.

Drawing on an extant data set (Dubbs, 2020), I had at immediate access the author and title of every article published in JRME, FLM, and ESM since 2010 that is indexed in JSTOR. Since JSTOR is my data source, the ESM data ends with 201x and the FLM data ends with 201x due to publisher embargoes. Since my argument is illustrative rather than definitive, this limitation does not dilute the implication. The dataset for this survey comprises 825 articles (189 in JRME, 196 in FLM, and 440 in ESM). Of those articles, only eight (2 in JRME, 1 in FLM, and 5 in ESM) include "learner" in the title. Similarly, only fourteen (3 in JRME, 2 in FLM, and 9 in ESM) include "mathematician" in the title. In contrast, 143 include “student” in the title (41 in JRME, 10 in FLM, and 92 in ESM). From this search, then, it is clear which of learner, student, and mathematician is dominant within the published literature. Since my focus is on the use of the title “mathematician,” I will consider those in detail and after a brief discussion of the uses of “learner.”

Within the JRME, there are two articles that include the word “learner;” both focus on English Language Learners in the mathematics classrooms (Shein, 2012; Turner, Dominguez, Maldonado, & Empson, 2013). In contrast, the single use of “learner” in FLM was Nyamekye’s (2013) study on Black adolescent mathematics learners. In ESM, the use of learner spans learner errors (Brodie, 2014); Southern African learners' struggles (Heyd-Metzuyanim & Graven, 2016); Japanese lessons from the learner's perspective (Hino, 2015); bilingual learners' mathematical communication (Ng, 2016); and virtual learner identities (Rosa & Lerman, 2011).

Of the fourteen uses of “mathematician,” eleven use mathematician in the exclusive, Pythagorean sense: credentialed mathematicians with (or soon to have) Ph.D.s (JRME: Lew & Mejía-Ramos, 2019; Radovic, Black, Salas, & Williams, 2017; Weber, Mejía-Ramos, Inglis, & Alcock, 2013; FLM: Beisiegel & Simmt, 2012; ESM: Beswick, 2012; Hemmi, 2010; Lai & Weber, 2014; Misfeldt & Johansen, 2015; Mejía-Ramos & Weber, 2014; Sincalir & Tabaghi, 2010; Weber & Mejía-Ramos, 2011; and Wilkerson-Jerde & Wilensky, 2011).

It is notable, then, that Radovic and colleagues’ JRME article (2008) on being a “girl mathematician” uses the term mathematician to refer to the three subjects of their study—girls in secondary school that have developed positive mathematics identities. This is but one of the mere three examples that use mathematician in the broader Aristotelean sense. Shriki’s (ESM: 2010) subjects operationalize “real mathematicians” as those that “formulate new concepts, raise conjectures, and prove or refute them” (p. 166)—that is, a mathematician is a doer of mathematics. Lastly, and similar to the central argument of this philosophical excursion, is Gadanidis’s (FLM: 2012) “Why can’t I be a mathematician?.” In their article, Gadanidis studies third-graders mathematical capacity and creativity when working with infinity—taking an explicitly anti-deficit stance on children’s capacity to be producers of mathematical knowledge, disrupting who can be a mathematician, and pushing for a school mathematics “worthy of children’s mathematical potential” (p. 25).

Gadanidis’ article is in alignment with some other researchers of children learning mathematics that have begun to name children as mathematicians (e.g., Fosnot & Dolk, 2001). In their books *Young Mathematicians at Work*, Fosnot and Dolk identify ways that children demonstrate mathematical brilliance, even during the earliest learning of number and operations. This is not to argue that those in pK-12+ are fully enculturated[4] into the community of mathematicians but rather than it is necessary to recognize that they have already begun to demonstrate their mathematical prowess and abilities as mathematicians.

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[4] I am hesitant at the usage of full/partial enculturation as it serves as an additional measure and verification of inequality. This, however, demonstrates the limits of language and the difficulty I arrive at when trying to eradicate implicit inequality from the language I use. I considered the use of mathematician1 and mathematician2 to distinguish between the Pythagorean and Aristotelian senses of the word, however, the numbers 1 and 2 invite an ordering which I reject.

Who Can Be a Mathematician? Implications for Mathematics Education Research

Rancière (2013) conceives of a distribution of the sensible, of coordinates which delimit the realm of possibility, which define the seeable, sayable, and thinkable in a particular space. For Rancière (1999), *political* is giving an account of those who are excluded to expose the limits of inclusion. This is precisely my intent in the present paper. In contrast to researchers referring to the subjects of mathematics education as learners or students, I argue that referring to them as *mathematicians* presupposes that they rightfully have a position within the community of mathematicians. Unlike learner or student which points towards a future of becoming-mathematician, and the potential for failing this accomplishment, referring to these subjects as mathematicians relocates the accomplishment of *mathematician* to today.

I am reminded, here, of Anna Sfard's "On two metaphors of learning and the dangers of choosing just one" (1998). Sfard discusses the acquisition and participation metaphors for learning, presenting both pros and cons for each, discussing the ways in which each has enabled particular foci within mathematics learning research. While acquisition supports a problematic 'transmission' model of learning, it has also enable a focus on the objects of mathematical thought and the ways in which learners are active in the learning process. Participation, on the other hand, Sfard argues is less useful in naming and discussing the cognitive structures that students construct. Like Sfard's stance on the two metaphors for learning, I am not convinced that either usage of mathematician is likely to cease. Unlike Sfard, however, who argues that "it is essential that we try to live with both" (p. 8), I do think one usage of mathematician can be said to be better than the other: *better* being that which is more equitable.

The Pythagorean mathēmatikós presumes an inequality and is reserved for only advanced researchers of mathematics. In contrast, the Aristotelian mathēmatikós refers to any individual that knows and does mathematics, regardless of its status as elementary (e.g., addition and subtraction) or advanced (e.g., research mathematics) mathematical knowledge. Children can be mathematicians (Fosnot & Dolk, 2001). Girls can be mathematicians (Radovic et al., 2017). Black men and women can be mathematicians (McGee, 2015; Stinson, 2013). Beginning from an assumption of *equality*, rather than an assumption of *inequality*, anyone that does mathematics, that demonstrates mathematical thought and practice, can be understood as a mathematician (Aristotle, 2015). This is not to say that anyone can *some-day* become a mathematician; they always already are. Which legacy of the term mathematician should mathematics education researchers champion? I defer to Aristotle:

μαθηματικὸς μὲν παῖς γένοιτ᾽ ἄν.
[mathēmatikós mén páïs génoit' án]
(Even a child can be a mathematician).

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