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FORUM

Emancipating subjects in science education: taking a lesson from Patti Lather and Jacques Rancière

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Abstract This paper extends the conversation started by Patti Lather in her forum response to "Neoliberal ideology, global capitalism, and science education: engaging the question of subjectivity", in terms of engaging the thought of Jacques Rancière. Rancière can offer (science) educators a more definitive example of (possible) emancipatory political subjectivities. His notion of radical equality can also aid in developing new pedagogical spaces in science education. This latter point is taken up in the concluding sections of this short essay.

Keywords Rancière · Subjectivity · Equality · Science education · Lather

"Whoever teaches without emancipating stultifies." (Rancière 1991, p.18).

In this forum paper I want to echo Patti Lather's call for an engagement with the thinker Jacques Rancière, specifically how Rancière's politics and radical notion of equality can provide (science) educators with new political possibilities that are sometimes thought to be foreclosed when working with theorists such as Michel Foucault. For example, many feel Foucault does not provide ethical-normative grounds for agency and political action. Lather (2012b) describes Rancière as "indispensible" (p. 1) to bringing a political (and "post-political") perspective of subjectivity to the field of science education, which seems especially true in terms of his emancipatory "pedagogy" and politics. In the following two sections, I will try to highlight how I think Rancière's notions of radical equality found in the text, *The Ignorant School Master,* can be of use to science teaching and science education scholarship. Rancière's disruption of the typical superior/inferior dichotomy of

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schooling towards emancipation through equality provides a way forward for educators looking to disrupt traditional hierarchies found in (science) education.

Rancière and radical equality

At the AERA (American Educational Research Association) meeting in April 2012, Patti Lather elaborated on how we, as education researchers, might use the work of Rancière in a "post-Foucauldian" framework by focusing on the empowerment given to subjects in moments of radical equality, and moving away from stultifying, authoritarian practices in education. For Lather, Rancière allows a more expansive notion of freedom and agency than one typically has access to when reading Foucault (especially if the final two volumes of the *History of Sexuality* are neglected). As Lather (2012a) argues,

> In Rancière's terms, to modify the regime of the sensible through the actions of those who act like political subjects against the invisibility to which they are consigned, is an elaboration/enactment of Foucault's "we are freer than we think" that goes beyond Foucault in suggesting terms for world-making action.

Rancière would have us be(come) political subjects through *dissensus* as a way of subverting structures and regimes that continually act as "police" (Rancière and Corcoran 2010). Where Rancière may be of significant use for science educators specifically, is in his call for students and educators to fundamentally question "explications" from "the learned", and apply their *own powers of reason* to objects of study, texts, the arts, and trades of all sorts. Following this directive in the field of science education scholarship and research would include serious questioning of the already "explicated" research paradigms as "proper" representations of scholarship. That is to say, paths explicated by some senior researchers who claim, often with vitriol, that they know definitively where science education research should be going (and what explanations are valid).

Lather (2012a) advocates a space for "scientific indeterminacy" whereby we consider the thoughts of others and celebrate the radical, and a priori, equality of understanding, communicating, and evaluating with others—"good" and "bad" labels for work would not be thrown out, but would become secondary. For Lather, Rancière can help us move beyond critique of emancipatory projects, and the stagnation of the left, towards a kind of revitalization of popular thought—the limitless potential of all individuals and their ability to learn and create. Following Lather's call, I would like to discuss just one of Rancière's works, *The Ignorant School Master: Five Lessons in Intellectual Emancipation*, as it relates to rethinking science teaching, learning, and related scholarship. For me, this book has helped open a more egalitarian way of working with students and colleagues. In addition, it has partially solved a fundamental "problem" for me first set out by Jean-François Lyotard (1984) regarding scientific language games and the communicative relationship between the sender and addressee of scientific knowledge. I will elaborate on these points in the section below.

A lesson for the intellectual emancipation of science education

In *The Ignorant School Master*, Rancière tells the story of a (partially accidental) teaching experiment by the nineteenth century French lecturer, Joseph Jacotot, in order to put forth a notion of radical equality that places the equality of intelligence at its core and before

(rather than after) emancipation. The experiment proceeds with Jacotot having his Flemish students learn the text, *Telémaque,* in French by providing a bilingual copy. The students were able to learn the text to such a level that Jacotot questioned the very need for the "explications" (explanations) of pedagogues and the learned. Rancière summarizes Jacotot's experiment in this way:

> Therefore Jacotot had taught them something. And yet he had communicated nothing to them of his science. So it wasn't the master's science that the student learned. His mastery lay in the command that had enclosed the students in a closed circle from which they alone could break out. (p. 13)

To Jacatot, and subsequently Rancière, explications served several functions, one of which was to maintain control over the "inferiors" (students, working classes) by those who knew better (pedagogues, the learned): That is, to establish and maintain the *very existence* of superiors, those who define knowing and learning, and inferiors, those who do not know and must be improved through a tautology of explications. Rancière goes on to describe the intricacies of a method called universal teaching by which anyone could teach something they themselves do not know, and in the process help restore the equality of intelligence and the use of *many kinds* of reason to *all* people. Here, the educator's job is to encourage students to prioritize their *own* intellectual powers when engaging an object of study. Therefore, an educator does not necessarily have to "know" the content under study because it is the specificity of a student's *application* of her own intellectual capacities that is under scrutiny. Universal teaching involves allowing students to explore with the teacher "at the door", yet still ask questions related not to content, but detail and personal transformation. As Rancière (1991) puts it, "The student must see everything for himself, compare and compare, and always respond to a three-part question: what do you see? what do you think about? what do you make of it? And so on, to infinity" (p. 23). The emancipatory possibilities of the method are found both in its potential to enable students to think for themselves and empower underprivileged, "proletarianized" populations to teach texts/practices/ideas to which they've been denied access. This summary does not do the book justice, but fortunately for those interested in further exploration it is a short and relatively easy read.

What may be useful for science educators are Jacatot's / Rancière's basic questions concerning explanations in school science: Are the ways we describe and explain science to students useful for their learning (all the time)? And if these explanations are, at least sometimes, limiting, for *what* and *whom* are these explanations given? Rancière argues that the explications given by explicators (teachers, scholars) are *not to be seen as the same* as that which is being learned, but rather as just one interpretation—even if the interpretations are good. "Stultification" sets in when an order of explications, set in place by "explicators", finds its only legitimation in the tautological judgment of a grand explicator (or grand explication). For Rancière, educators and pedagogues often maintain control over the *difference or gap* between learning and understanding through their explications or adherence to a system of explications. Seen this way, the potential lesson for science educators is that school systems and pedagogues may actually be creating the conditions for incapacity and the control of (student) creative powers. As Rancière says of the pedagogue—"It is the explicator who needs the incapable and not the other way around; it is he who constitutes the incapable as such" (p. 6). In a similar way, those who desperately need to define "what science is" and "what should be learned about science" often control learning through these definitions. As Rancière explains:

> The explicator's special trick consists of [a] double inaugural gesture. On the one hand, he decrees the absolute beginning: it is only now that the act of learning will begin. On the other, having thrown a veil of ignorance over everything that is to be learned, he appoints himself to the task of lifting it. (p. 7)

In this way the pedagogue or explicator controls the origins and the end of learning. This is somewhat similar to how Foucault (2003) defines suprahistorical accounts or narratives. That is, to gain control of a discourse (about anything) one merely has to control (which includes obscuring) historical origins and a future endpoint. I recently tried to make this case at the National Association for Research in Science Teaching (NARST) 2012 concerning the nature and history of science found in the American *National Science Education Standards* (1996) where the origins of scientific ideas were described as the result of rational, inevitable discovery, and any "debunked" ideas the product of flawed reason. The result being that all other kinds of social and cultural influences in scientific discovery (whichever are deemed unimportant) could be effectively muted through control of the origins and end point of "good/correct" scientific ideas (Bazzul 2012). Rancière (1991) makes this same point in his interrogation of education systems where senior educators and pedagogues stultify and reproduce "inequalities of intelligence" by control at both the beginning and the end of learning.

Rancière (1991) can help critical science educators understand and move around the apparent impenetrability of science education scholarship, that is, the field's relative resistance to different ideas about science. Science education seems to be quite bound to the explications of senior scholars, whose explanations of science and its basic tenets decide for the rest of the science education community when learning has started (when we have properly focused on "relevant" research problems), and when learning has "happened" (when through review of the master scholars/pedagogues, we finally gain acceptance to special journal issues/books). However, this resistance to critique and different ways of thinking in science education also partially resides in the very way scientific knowledge is transmitted. I want to discuss one particular epistemic aspect of this, as articulated by Jean-François Lyotard (1984) in *The Postmodern Condition*, with the aid of Rancière's notions of radical equality.

Lyotard's (1984) description of the transmission of scientific knowledge can help science educators see, at a very basic level, why relatively unproblematic or narrowly universalized ways of knowing can easily prevail in 'typical' cultures of science (education). According to Lyotard, at its very core, scientific knowledge transmission involves strict rules between the *addressee* and *sender* of knowledge statements. First, the sender of knowledge must be able to show proof of what they say as well as reasons to refute other statements. Second, the addressee *must be able to give assent* to what she hears, making her a *potential sender* herself and subject to the burden of proof and refutation, after which she then becomes *equal* to the sender. When the addressee accepts such conditions she enters into the world of scientific scholarship. Equals are needed to judge the truth quality as well as the competence of the sender. The point here is that modern science as a language game, a set of rules and relations that authorize particular 'moves' within a community (science, according to Lyotard, being one such language game), rests on clear assumptions about what counts as truth and who the speaker is. Thus, at its core, the way (modern, Eurocentric) science is currently practiced necessarily sets a particular emphasis on the *neutrality* of the speaker and addressee, their ability to think "rationally," and their uniform similarity. In this atmosphere, it is easy to see how a more "multiplicitous" and nuanced perspective of *what* is said (ex. semiotically), *who* is speaking (ideologically), and the relationship between knowledge and the social order may be *inherently difficult*.

Following Lyotard's (1984) description it would seem that there is something stifling about science's inability to see that all of its methods and knowledges are to some extent ideologically and politically embedded (Trifonas 2012). The content of science is seen to traverse subjects unproblematically, from sender to addressee, which very easily leads to the assumption that knowledge itself is "real" and free from sociocultural and political formulation. Lyotard's contextualization helps us see how didactics and science teaching have come to be intricately interwoven. Students in science can then be essentially "filled up" by their teachers when it comes to scientific knowledge. However, this schema is *also* radically egalitarian as the scientific language game must, ideally speaking, acknowledge the *equality* of speaker and sender. The question is, how do science educators reconcile the stifling- refusal to recognize the *situatedness* of both addressee and sender, with the radical potential—the *uncompromised equality* of addressee and sender? Rancière (1991) assists here in seeing that Lyotard's basic formulation is not a stalemate, but a description of science that has perhaps not been taken (radically) far enough. This is to say that the radical equality between science learner and science educator must not just be *assumed* epistemologically, it must also manifest itself in the *learning situation*, so that explications cannot take the place of students' learning, thinking, and understanding for themselves. Science education must resist the tendency to think that there are superior and inferior minds (even though anyone who has studied the sciences will know all too well that this is quite often generally assumed) and only some are qualified to "explicate". This is not to say that some works or interpretations are not better than others, but simply that we all have the ability to produce, evaluate, and communicate. To move towards Rancière's vision of equality of intelligence, science educators need to consider the situated nature of *all* explications in order to appreciate the differences between them and the application of equal intelligence (not all peoples have the means to contribute equal *attention*).

Therefore, there is nothing inherently wrong with the language game of science in terms of assuming a kind of universality of addressee and sender *if* the messages (discourses of science), the complexity of both addressee and sender are taken into account and the radical equality of sender and addressee is taken to its end. Rancière (1991) offers a more subtle description of the communication between equals of intelligence (all human beings) where:

> Thought is not told in truth, it is expressed in veracity. It is divided, it is told, it is translated for someone else, who will make of it another tale, another translation, on one condition: the will to communicate, the will to figure out what the other is thinking, and this under no guarantee beyond his narration, no universal dictionary to dictate what must be understood. (p. 62)

There can be no hope of a *pure translation* between sender and addressee. There is no universal script only the "will to communicate" between two equal individuals—individuals who will inevitably give their own translation of overall schemas or what has been put under focus. This act of communication between sender and addressee should not be downplayed because, according to Rancière (1991) speech and discourse are requisites to any learning—students must speak about what they want to learn. This type of learning then requires a *room of equals* to nurture a *will to communicate* and understand. Learners need equality, while the pedagogues and senior scholars who only wish to peddle their own explications, need inequality. As Rancière puts it, "Beneath the pedagogical relation of ignorance to science, the more fundamental philosophical relation of stultification to emancipation must be recognized" (p. 14).

Subjectivity and emancipatory (science) education

Alex Means (2011) in his paper, *Jacques Rancière, Education and the Art of Citizenship*, explains the importance of Rancière this way,

> Rancière suggests that the essence of education is found not in the rationalization of curriculum or in the pedagogical act of transmission from teacher to student. Rather education is a question. It represents an indeterminate process of attention and exploration: the becoming of each individual's capacity as a creative and equal subject in common with others. (p. 29)

Bringing this forum conversation back to where it began, an engagement with subjectivity, Rancière (1991) describes education for emancipation as the opposite of stultification by the master, whereby everyone becomes aware of her/his nature as an "intellectual subject" (p. 35). While this may sound like Rancière is promoting the typical modern rational subject, it could also be said that he is advocating for a kind of *immanent* modern subjectivity of the kind that Michael Hardt and Antonio Negri (2000) promote in *Empire*. That is to say, one that harnesses the free powers of reason without (and against) the subsequent controlling forces of modernity that work to limit immanent reasoning by fundamentally connecting it to other restricting modern "inventions" such as the rule of private property and the "naturalness" of the nation state. Here, again echoes of Foucault can be detected in Rancière's thinking as both essentially promote a similar project of an engagement with self against doxa (what is taken for granted). It could be said, and I believe Lather is saying as much, that Rancière has taken Foucault's later work to *heart*.

We can turn to Means again to see how Rancière takes up Foucauldian notions of subjectivity to declare a new kind of politics:

> Politics, or dissensus as Rancière refers to it, occurs when the universal presupposition of equality is pressed into service in a singularized form, when a group or individual articulates a wrong and thus gives form and content to their fundamental equality within the political community. Politics is thus a process of *subjectification*: a contingent moment when those occluded from the political community (the "supernumary" element or "part of no-part") constitute themselves as equal subjects and in turn disarticulate and reconfigure the partitions of the sensible order. (p. 31)

The movement towards Rancière's notion of radical equality in science education will also involve a move towards reframing pedagogical commitments. That is, a move towards tearing down hierarchies and fundamentally unequal (and unjust) sociopolitical relations. It is a way (one way) to connect the pedagogical with the political in science education, and bring forth the level (horizontal) plane of scholarship that science promises (perhaps has promised since Newton and Galileo). Radical equality as an approach also has the potential to enable a critical reappraisal of science as a value-laden discourse by allowing the situated voices of science learners to come forth.

Science educators can facilitate the equal intellectual power of their students by having them *bring that power to bear* on an object of learning. In science education, this would inevitably open up the field and let the "rabbits run lose" (an expression I've recently heard used by senior researchers who do not want rabbits running anywhere!). Following Rancière, science educators can resist giving students a measure of their inability by *only* showing them how they measure up to fixed explanations. Instead science educators can teach to emancipate; or count on stultification.

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