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Abstract

I read James Gee's response to my paper at the same time that I was beginning Sherry Turkle's (2008) book "Falling for Science: Objects in Mind." Reading Gee against the backdrop of Turkle was helpful.

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Comments

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KATHERINE RICHARDSON BRUNA

RESPONSE TO GEE'S COMMENTARY ON *WAYS WITH WORDS*: LANGUAGE PLAY AND THE SCIENCE LEARNING OF MEXICAN NEWCOMER ADOLESCENTS. A 21ST CENTURY NICHE FOR THE NATURAL

I read James Gee's response to my paper at the same time that I was beginning Sherry Turkle's (2008) book "Falling for Science: Objects in Mind." Reading Gee against the backdrop of Turkle was helpful. In support of her goal to counter the stereotypical dispassionate image of the scientist, Turkle's collection of essays is persuasive in the way it illustrates, how, to the contrary, "scientists' attachments to objects are red-hot" (p. 9). Turkle uses words to describe scientists' work that have been summarily divorced from traditional representations of science: "love," "passion," "pleasure," "seduction," "intimacy." In reading the essays, it becomes clear how such emotions arise out of what I believe Gee would describe as the "niche" discovery and exploration provided by object play. An eight-year-old girl braiding and re-braiding her shiny My Little Pony's hair is discovering and exploring a "niche" that she will later understand as "recursion" (p. 3). A young boy counting the steps of a hill and the hexagons of a beehive is discovering and exploring a "niche" that he will later understand as "geometry" (p. 7).

Children in rural Mexico, particularly in the village where I do my research, up until just a few years ago were accustomed to growing up with a pig or two in their backyards. Their observations and interactions with those pigs afforded them a similar site of "object attachment" that generated its own "niches" for discovery and exploration. Those "niches" arose as they witnessed the adults in their lives carefully tending to the pigs' feedings, growth, reproduction, slaughter, and preparation for consumption. It is precisely in the conflict between the organic "niches" arisen out of such home-based pig-related learning and the artificial "niches" imposed by the school-based pig-related (dissection) learning backgrounded against the society-based pig-related (meatpacking) learning, iconic of "Mexicanness" in that community, that I situate the language play of the Mexican newcomer adolescents I chronicled; they, as Gee writes, "see the stupidity and they poke fun at it." They see the stigma associated with the teacher's framing of the pig dissection as preparation for work at the hog plant and, subverting her imposition of her "niche" over their own for this activity (see Richardson Bruna and Vann, 2007 and Richardson Bruna, Forthcoming), they engage in language play as, to use Gee's phrase, "serious fun."

Given the enduring importance of objects – be they My Little Ponies, steps and beehives, or pigs – in creating “niche” zones onto which we and/or others attach words (and, unfortunately, ideologies about what “niches” are appropriate for what kind of people), it makes sense that efforts to reform science education would emphasize providing students with opportunities to experience the objects of science practice in new (more intimate, pleasurable, seductive, etc.) ways. As Gee notes, inquiry-based science instruction is one movement currently afoot that stands to do this. But it will be ultimately limited in its effects, he cautions, unless it can proceed from a much more radically person-centered stance (I purposefully avoided “learner-centered” here because the inscription of a person as a “learner” presumes a target identity against which our teaching of them proceeds and this identity presumption – i.e., “You are doing this because ‘scientists’ do this and I want you to think of yourself as a ‘scientist’– is, as Gee points out, itself problematic; scientists, he says, do not engage in science practices to “do science” or “be a scientist,” but, rather, to interact with others who share their curiosity about a particular question or theme as well as their “love and “passion” for its related objects. And, as Gee notes further, with our increasingly trans-disciplinary world, these colleagues may not, in fact, be “scientists” at all, but “artists.” It is their object attachment and the enjoyment of the practices related to that object that unites them, not a priori professional distinctions. This, it seems to me, is the kind of person-centered inquiry Gee is calling for in science, and in schooling more generally: Provide students with object-rich, well-designed, problem-driven goal spaces that afford them the opportunity to discover and explore a number of practices associated with authentic social and professional roles. In doing this, words have a better chance of attaching to “niches” in ways that are, because of their meaningfulness and utility, enduring.

Where I am yet to be convinced by Gee is on the role played by digital media in this learning (and perhaps this is because I have not played enough video games, something my children who, admittedly, enthusiastically agree with Gee’s thesis, remind me of every day). My interest in conceptualizing what this radicalized inquiry space would look like in science education in “real life” and how it could address the host of ethical issues that surround the social practice of science, issues, which, as a critical multicultural teacher educator, I am eager to infuse into the curriculum to prepare students for active, responsible civic engagement, still remain. I see the promise of Portal in providing students with an experiential understanding of the physics of the conservation of momentum and, not insignificantly, the passion involved in being connected to a larger community of practice. I absolutely get how, in playing Portal, the participants attach words to a world “in order to really learn and understand and own it.” I am so intrigued by how the virtual world of Portal can lead to “discoveries about new and unexpected properties of the real world.” And I, of course, agree that “*words* don’t care whether they attach to niches in the real world, virtual worlds, or just imaginary worlds (emphasis mine).” But *I* care. Whatever a student may learn from her virtual investigation of anatomy, as Gee rightfully proposes at the beginning of his

response to my paper, I would want to ultimately transfer, if she were to choose to become a surgeon, to her ability to successfully perform an operation on a real body. I understand that Gee is not advocating for a virtual-only education; it is this issue of transfer, of fluency *across* the virtual and the real domains, that, for me, is absolutely critical to think through.

And, when it comes down to it, I know that, just as there are aspects to maneuvering in the virtual world that the real world cannot duplicate, there are aspects to maneuvering in the real world that the virtual cannot replace. A virtual investigation of a pig's anatomy (though, I agree, a more sensible alternative to dissection) is likely not to have produced in the "English Learner Science" classroom, the powerful sense of physical repulsion and ethical concern that pervaded that setting. These student emotions ultimately led, as I describe in Richardson Bruna & Vann (2007) and Richardson Bruna (Forthcoming) to the teacher's re-framing of the pig dissection activity within more authentic social practice of science discourse—how animal dissection is used to help advance human understanding and how there are groups that oppose such use of animals. It is, as I argue, through the students' own intelligent and ethical behavior, despite their teacher's demeaning depiction of them as future workers at the hog plant, that they come to transform the words attached to the "niche" of the pig dissection that day. This intelligence and ethics had its roots, I assert, in the relationships these students had with pigs in their homes and communities in Mexico, relationships they described in the course of instruction. It is the very realness of their memories of what a baby pig looks, sounds, and smells like that produces the revulsion they have when confronted with the task of cutting open a dead fetal pig; it is the very realness of their knowledge about pig gestation that allows them to predict the age of the fetal pigs based on their size; it is the very realness of the use of pigs as food for human families that are struggling to make ends meet (the severity of their socio-economic condition is why these students' families have migrated to Iowa to begin with) that raises the ethical question that the pig dissection is just "wasting pigs." I doubt a virtual pig dissection would have brought up this powerful constellation of student responses. The real is potent precisely because it is so multi-sensory and these sensations, far from being individualized, are important ties to the socio-historical.

In the village in rural Mexico where I do research, families no longer keep pigs in their backyards because, with NAFTA, the price of their feed, corn and sorghum, has become too high. Within a five-year period, a region known for its ubiquity of pigs, is now relatively pig-less. That place and, with it, people's experience of themselves in that place, has been transformed by economic policies many do not know about or well understand. The simple fact, for them, is that for years it made sense to keep pigs and then it started not to. The Mexican newcomer adolescents whose science learning I chronicle are links to a past that is further receding in Mexico—a time when families could work knowledgeably and ethically with pigs in line with their own means and ends. Now, unless the schooling and social system improves to acknowledge and meet their needs, these students with their family members, *will* be on *the* line as just more unskilled, low-wage workers performing the repetitive movements of industrialized meatpacking to profit others through their exploitation.

Turkle (2008) writes, “I have traced my students’ object passions across the years of the digital revolution ... They are seduced by the control of the digital, the freedom of the virtual, but always brought back to the physical, the analog, and of course, to nature” (p. 13). I find in the example these students have provided me no better support for the importance of the natural in grounding intelligent and ethical instructional dialogue that, indeed, creates instructional change. It is true, as Turkle notes, that students “now grow up in many worlds” (p. 13), among these the digital, and that educators must be responsive to this fact. But the natural world poses real social dilemmas that demand our attention. Fortunately for all of us, the experience of having lived those real social dilemmas can serve to shape, as I have discovered, great thinkers. I will be more ready to embrace the advances the digital world can bring to instruction once science education shows itself to be doing a better job of what should be its most basic objective: building on the multi-sensory lived experiences, the object attachments and enchantments of childhood’s vast and varied natural niches, that all students bring to their learning.

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