Using theory to “work on” social systems through science education

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Structure, agency and the relationship between them have been gaining attention lately in science education; for example, a forthcoming special issue of the *Journal of Research on Science Teaching* will focus on how these theoretical constructs are used in that field.

In her edited volume that explores uses of social theory, Jean Anyon (2009) cautioned that, when using social theory, our goal cannot be just to provide “richer data and fuller explanations of events” (p.6). In this spirit, I explore the theme of the militancy of theory (Hardt, 2011) and suggest that the over-emphasis of agency and de-emphasis of structure in science education has led us to miss the powerful dialectic that plays out between these two constructs, and thereby has limited the power of this social theory in working upon social systems (Anyon, 2009, p. 3).

(Over-)emphasis on Agency

In a recent review of the use of agency in science education, Arnold and Clarke (2014) problematized the ways agency has been defined in much science education research. Although agency is conceptualized in different ways across science education, there are several common threads. In many cases, behavior is considered agentic if it is associated with intention or purpose by the actors. For example, Tan and Barton (2008) conceptualized agency as “purposefully authoring identities-in-practice” (p. 43). Similarly, Basu, Calabrese Barton, Clairmonte, and Locke (2009) defined agency as occurring “when individuals or groups act upon, modify, and give significance to the world in purposeful ways” (p.355). Likewise, Rivera Maulucci, Brown, Grey, & Sullivan (2014) describe agency as students’ capacity to act “to achieve personal goals in science and in school” (p.5), once again emphasizing purpose. However, Arnold and Clarke (2014) assert that focusing on the purposefulness of the actor seems to rely “upon cognitive psychological assumptions in assigning intentions” (p.742).

The second thread found in the use of agency in science education research links agency with creating change in one’s lifeworld. For example, Mallya, et al. (2012) focused on
students’ ability to use the science they learned “to better their lives and the lives of those around them” (p.246). They looked at knowledge moving from in-school to out-of-school contexts and took agency as students’ efforts to “utilize the science understandings they construct in their … science classrooms as they make decisions and take action in their everyday lives” (p.248). Similarly, Basu, Calabrese Barton, Clairmonte, and Locke (2009) defined agency as “when individuals or groups act upon, modify, and give significance to the world in purposeful ways, with the aim of creating, impacting and/or transforming themselves and/or the conditions of their lives” (p. 355).

Many similar examples of agency in science education research could be provided, for there are many papers that provide rich descriptions of agentic actions of students and teachers, many framed as defiant in some way. But the use of structure, as a companion construct of agency, is much less frequent in science education research. For example, in the Rivera Maulucci paper cited above, there is only one mention of structure. The authors refer to “hegemonic structures” (p.27) that feed systems of stratification in society. Even in this mention of structure, it is not discussed in relation to or as a counterpoint to agency. My intent is not to single out this research; it is not alone in its emphasis on agency. Rather, this paper illustrates that it is common in science education to focus on agency (both theoretically and methodologically) and give much less attention to structure. Arnold & Clarke (2014) noted this great emphasis on agency and lack of attention to structure in their review of science education research. However, science education is not alone in this imbalance, as the same phenomenon has been reported in other fields (e.g., Block, 2013).

In the examples cited here, it appears that the work of researchers in science education has mirrored that of other scholars who have “moved away from a concern with social reproduction and focused instead on individual mobility” (Anderson, 2005, p.3). However, this imbalance between agency and structure has consequences, and to explore those consequences I draw upon Sewell’s ideas about the relationship between structure and agency.

According to Sewell (1992), agency can be thought of as the expansion of schema and resources outside of one’s original set or the use of schema and resources in new ways. While agentic actions such as these are possible, they must work against structure and are
constituted by structure. This is where the dialectical relationship between structure and function is key. According to Sewell, structure shapes actions and practices, “but it is also people’s practices that constitute (and reproduce) structures” (p.4). This helps us understand the “strong reproductive bias built into structures” (Sewell, 1992, p.16), but also to see the possibility of transforming structure through agentic actions. Sewell reminds us that, “reproduction is never automatic. Structures are at risk, at least to some extent, in all of the social encounters they shape” (p. 19), because schema and resources can be used in different ways and in different places, they can have different meanings, and they accumulate and gain value in unpredictable ways.

Returning to our analysis of how agency has been used in research, Anderson (2005) suggested that focusing on agency as purposeful action privileges a perspective of choice as the key to social action and leads us to obfuscate the powerful structural constraints acting on non-dominant groups, particularly. It understates the systemic nature of structure and the reproductive power with which it is embued, and pushes these issues to the background. In doing so, issues of political economy are often replaced by individual and local change, for example changes in classroom teaching and learning.

The current use of agency also causes us to not take good advantage of the dialectical relationship between agency and structure, for it is the dialectical nature of structure and agency that enables one to shape and change the other. So a lack of attention to structure leads us to miss the very power of these constructs when used in tandem and causes us to miss the opportunity to see and understand how structure might actually be changed. There certainly is value in documenting the identity work and agentic cultural productions of marginalized youth, as I have also done (e.g., Seiler, 2001; Seiler & Gonsalves, 2010). But in this essay, I ask if that is enough, and if we cannot get more out of these theoretical constructs and our research.

What more?

In his review of Anyon’s book, Radical Possibilities, Anderson (2005) restates her position that “throughout history, the only way that wealth concentration in the United states has been stopped or reversed has been in periods of mass social movements” (p.2). Anyon challenges us to think about how ordinary people have become involved in social movements such as
the Civil Rights Movement of the 1960s and reminds us that it arose through the coming together of smaller struggles. Further, she argues that education could be a source for igniting smaller social struggles and for bringing them together into a larger movement that might target powerful political and economic structures. At this moment in time, perhaps they could come together with Black Lives Matter and other movements and social actions that have arisen in recent months in response to violent policing targeted at black men.

I believe that Lave and McDermott (2002) might argue that, rather than confront the reasons for the alienation of non-dominant youth from learning, our linking agency with intention and purpose and local change leads us to “lose sight of the conditions that created the problem” (p.28). By doing so, we fail to recognize that the current social and educational conditions have been historically and socially constructed and are resistant to change.

When considered against a Marxian rubric of alienation (Ollman, 1996), many instances labeled as agentic illustrate that identities can be constructed around learning to work the system or getting around a system of learning that is oppressive. While nurturing agency as defined in science education is a laudable goal in the short-term and for individual students, our reliance on this construct may block our attention to deeper problems with schooling and society that exist even within our attempts at creating alternative learning spaces and opportunities. Without creating truly transformative experiences, which might lead to political and economic change, we might be reproducing the “hierarchies that replicate injustices in the distribution of access and rewards” (Lave & McDermott, 2002, p. 21). However, as Marx tells us, this should not come as a surprise—our construction of alternative, de-alienating learning spaces and opportunities is reflexively and historically shaped by the very system that constrained our own learning, and we must fight mightily to free ourselves and our learning spaces from its pervasive influences.

References


