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FORUM

Teacher agency in the performance of inquiry-oriented science curriculum reform

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Abstract In this commentary, I consider several theoretical and analytical aspects of Tang Wee Teo and Margery Osborne's case study. I begin by identifying structuralist and cultural themes in Tang Wee and Margery's theoretical model of human activity. Next, I offer an alternative interpretation for Tang Wee and Margery's reported findings in terms of the notion of multiple teacher agencies. After that, I discuss the dramaturgical or theatrical nature of the symbolic interactionist model used by Tang Wee and Margery, focusing specifically on the issues of teacher role-taking and curriculum authorship. The paper then ends with a discussion about the significance of Tang Wee and Margery's study wherein I emphasize the need for science education researchers to give more careful consideration to teacher agency and the analytical value of theatrical metaphors from the field of social dramatism.

Keywords Inquiry · Curriculum reform · Teacher agency · Performance · Social dramatism

> What, after all, is human life if not a continuous performance in which all go about wearing different masks, in which everyone acts a part assigned to him until the stage director removes him from the boards? Of course on stage certain things are coloured too brightly and overemphasized, but both on stage and in real life there is the same make-up, the same disguise, there are the same everlasting lies.
>
> Erasmus of Rotterdam

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This commentary addresses theoretical and analytical aspects of Tang Wee Teo and Margery Osborne's case study entitled: Using symbolic interactionism to analyze a specialized STEM high school teacher's experience in curriculum reform.

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In their case study, Tang Wee and Margery provide us with a very impressive and insightful analytical account of Daley, a chemistry teacher at a specialized STEM high school, who engages in a self-initiated curricular reform effort aimed at changing an advanced chemistry course to make it more inquiry-oriented and less content-based. Drawing upon previous theoretical work by renowned interactional sociologists such as Erving Goffman and Herbert Blumer, Tang Wee and Margery define teacher agency as "lines of actions organically derived and generative from social interactions ascribed with symbolic meanings (p. 5)." This definition is highly consistent with the current views of linguistic anthropologists such as Ahearn (2001) who conceive of human agency as "the socioculturally mediated capacity to act (p. 112)." By adopting such a sociocultural stance on teacher agency, Tang Wee and Margery begin to answer the very important question: What does it mean for a science teacher to be a social agent of inquiry-oriented science curriculum reform?

Considered in this commentary are the theoretical and analytical aspects of Tang Wee and Margery's approach to answering this question as well as the significance of their reported answer(s) in light of the broader scholarly literature on human agency drawn from varied fields of research across the social sciences. The text is organized as follows. I begin by identifying structuralist and cultural themes in Tang Wee and Margery's theoretical model of human activity. Next, I offer an alternative interpretation for Tang Wee and Margery's reported findings in terms of the notion of multiple teacher agencies. After that, I discuss the dramaturgical or theatrical nature of the symbolic interactionist model used by Tang Wee and Margery to examine science curriculum reform, focusing specifically on the issues of teacher role-taking and curriculum authorship. The paper then ends with a discussion about the significance of Tang Wee and Margery's study wherein I emphasize the need for science education researchers to give more careful consideration to the emergent nature of teacher agency and the analytical value of theatrical metaphors from the field of social dramatism in developing more sophisticated, theory-based understandings of the interactional micro-processes underlying teacher enactment of inquiry-oriented science curriculum reform.

A dialogic model of agency

Despite its important and pervasive use across scholarly fields as varied as linguistic anthropology and philosophy, "agency" remains a term that is defined unclearly, simplistically, and narrowly (Ahearn 2001). Therefore, to make its theoretical meaning clearer, it might be helpful to situate the dialogic model adopted by Tang Wee and Margery in the larger scholarly literature related to this topic. A good starting point is the review of theoretical models commonly used to understand and analyze social systems provided by Carspecken (1996) who identifies three main themes: mechanism, structuralism, and culturalism. In a mechanistic theme, human agency is treated in a deterministic manner as simply the result of an existing social organization that remains unaffected by human choice or free will. This theme largely precludes the possibility of cultural transformation or change by assuming that human agency is socially conditioned. Structuralist themes on the other hand view human agency as emerging from the routine activity or practice of individuals (i.e., human action) in particular social contexts or structures in a mutually constituting relationship—human actions are not only shaped by social structures (i.e., cultural reproduction) but can also shape existing socio-structural conditions (i.e., cultural transformation). Social change or transformation is possible, despite the constraints of a self-reproducing structure, due to inherent structural tensions and contradictions which lead to the "loose structuring" of humans whose actions are not completely free nor completely socially determined (Ortner 1989). Lastly,

cultural themes embrace the notion that human agency requires volition—a mental state characterized by intentionality, motivation, rationality, and action monitoring. As a result of emphasizing rational choice, culturalist themes tend to treat human agency as free will, a capacity exercised by completely autonomous individuals. Although reasonable, such rational choice model of human agency has been criticized for overlooking cultural, institutional, and normative influences on human activity (Burns 1994).

The above framework allows us to recognize that Tang Wee and Margery's dialogical perspective on Daley's teacher agency cohesively combines structuralist and cultural themes by examining how science curriculum reform (i.e., a social transformation or change) is actively pursued within a particular social structure (a specialized STEM school for the gifted) through the volition (rational and reflective curricular choice) and activity (dialogic interactions with stakeholders and symbolic factors) of a social agent (Daley) despite the existence of reproductive constraints (a school culture that favors high student AP scores over in-depth and meaningful science learning). As such, it is clear that Tang Wee and Margery's dialogic model is consistent with the latest arguments and theoretical advancements found in the vast and complex scholarly literature related to agency.

Particularly noticeable in Tang Wee and Margery's analytical employment of their dialogical model is the structuralist theme of inherent contradictions and tensions. As reported in their study, Daley capitalizes on a seeming structural contradiction between the STEM school's official mission ("[to be] *the world's leading teaching and learning laboratory for imagination and inquiry*") and the type of science education actually offered to students (a traditional content-focused and teacher-centered AP chemistry course) while setting up the curriculum reform. By doing so, Daley effectively makes his envisioned structural transformation toward a more inquiry-oriented type of chemistry curriculum a more realistic and feasible possibility. However, rather than simply producing a less contradictory STEM schooling social structural, his reform efforts create a new structural contradiction—an apparent incompatibility between the revised, inquiry-based chemistry curriculum with a reduced emphasis on content coverage and the expectation of high student performance as demonstrated by their AP scores (contingent largely on content coverage). As such, Tang Wee and Margery's empirically based dialogical model underscores the inherently contradictory nature of structural transformation.

Multiple teacher agencies

In their analysis, Tang Wee and Margery avoid drawing a simplistic connection between type of schooling (public or specialized STEM) and amount of teacher agency ("more" or "less"), providing instead compelling evidence that "Daley's teacher agency had to be constantly claimed and reclaimed rather than endowed or protected even when favorable conditions were present (p. 49)." In doing so, Tang Wee and Margery avoid treating teacher agency mechanistically, that is, simply as an unproblematic result or manifestation of an underlying school structural organization. Their sociocultural analytical approach is consistent with theoretical arguments previously made by scholars of human agency such as Ahearn (2001) who have emphasized that

> "It is not useful, in my opinion, to talk of having 'more,' 'less,' or even 'no' agency… agency is not a quantity that can be measured. Rather, researchers should focus on delineating different kinds of agency, or different ways in which agency is socioculturally mediated in particular times and places (p. 122)"

This is precisely what Tang Wee and Margery are able to accomplish in their research study. However, it is noticeable that no analytical distinction is made among the different types of teacher agency sociointeractionally accomplished by Daley in the course of his science curriculum reform efforts. As a result, Tang Wee and Margery's analysis appears to a certain extent to fall short of entertaining the possibility of multiple types of human agency such as oppositional and complicit agencies (Ahearn 2001), or embracing the notion that human agency indeed encompasses multiple dimensions as power and intention (Ortner 2001). Instead of viewing Daley's social agency multidimensionally, Tang Wee and Margery adopt a one-dimensional stance on teacher agency (i.e., their analytical approach presumes the existence of a single type of teacher agency). Such an analytical approach to a certain extent prevents them from making more nuanced distinctions among the different types or dimensionalities of interactionally emergent teacher agency that their examination of Daley's curriculum reform efforts appears to reveal. This point is further elaborated below.

To grasp the multiplicity of Daley's teacher agency, we first need to recognize that, as part of his curriculum reform efforts, Daley engaged in three different types of social activities—presentations, curriculum revision and enactment, and research interviews—from which his agencies could potentially emerge. From a structuralist perspective, each of these activities presented Daley with an opportunity to engage in a different type of social action invariably linked to the STEM schooling social structure. Overall, three different types of teacher agency can be said to have emerged from interactions between each kind of social action engaged by Daley and the STEM schooling social structure. For instance, interaction between the STEM schooling social structure and Daley's actions of defending his preliminary ideas against opposition, criticism and skepticism during his presentations at the whole school meeting and national conference led to the emergence of *oppositional agency* (see Fig. 1 below). Commonly found in feminist gender studies, oppositional agency has been used in reference to acts of resistance employed by women to oppose constraining social structures based on gender (Goddard 2000). Similarly, Daley demonstrated oppositional agency by resisting the reproductive and constraining pressures of the STEM schooling social structure.

The second type of teacher agency demonstrated by Daley was *pedagogical agency*—the socioculturally mediated capacity to act upon and (re)shape the science curriculum and the type of science instruction offered to students in his classroom. This particular type of teacher agency emerged from extended interactions between the STEM schooling social system and multiple educational actions performed by Daley as part of the process of curricular revision and enactment (see Fig. 2 below). More specifically, Daley's pedagogical agency was socioculturally mediated by a variety of educational activities such as individual curriculum rewriting, email communication, summer faculty meetings, report writing, and face-to-face classroom enactment of curricular changes. Moreover, Daley's pedagogical agency was demonstrated through the articulation of a new-student-centered and constructivist teaching philosophy, reduction in the number of learning objectives,

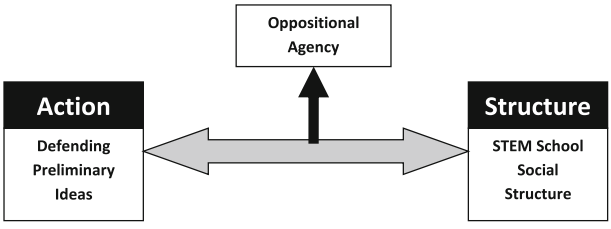

Fig. 1 The emergence of oppositional agency during Daley's presentations

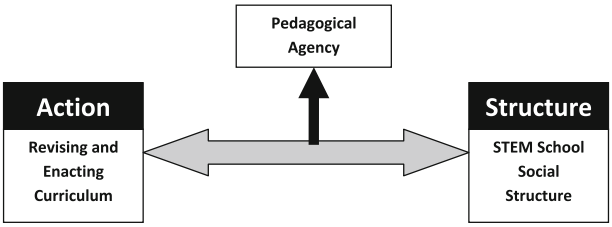

Fig. 2 The emergence of pedagogical agency during Daley's curriculum revision

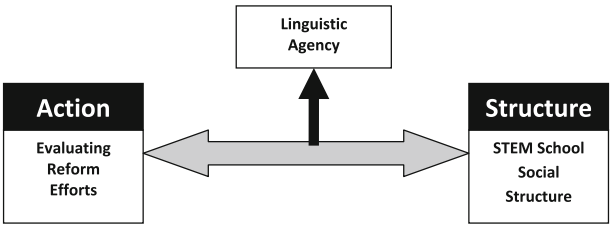

Fig. 3 The emergence of linguistic agency during Daley's interviews

changes in the grading system, and addition of new activities (problem-solving, collaborative and independent work, and open-ended labs).

The research interviews conducted by Tang Wee and Margery provided Daley with a third type of social activity in which to demonstrate *linguistic agency* (Fig. 3). This kind of agency has been identified by linguistic anthropologists such as Ahearn (2001) who emphasizes that "linguistic resources can be used to exercise, attribute, or deny agency (p. 120)" (i.e., agency can be encoded in the ways that speakers and writers use language). An interesting example is provided by Graham (2003) who points out that Xavante Indians in central Brazil demonstrate linguistic agency by portraying themselves as controllers or masters of history rather than victims of oppression (i.e., recipients of oppressive actions by others) while *performing dreams* (publicly reenactments of traditional historical narratives). Similarly, Ahearn (2003) describes how the language used by writers of love letters in Nepal express individual agency over their romantic relationships (i.e., communicate love as product of their own agency rather than something that simply happened to them). In sharp contrast, the language used by Daley during the interviews suggests that he is to a certain extent denying his own individual agency over the reform efforts that he initiated. This is clearly evident in the quotation used by Tang Wee and Margery to begin the study, wherein Daley utters "*I think, I really, really, had a change of heart in a sense*." His choice of words is telling in the sense that he chooses to describe his modified opinion about science inquiry teaching as simply a "change of heart," that is, as something that just happened to him, not a product of his own individual agency or something that he or anyone else was responsible for. In doing so, Daley appears to deny or negate the individual agency that previously emerged in his self-initiated science curriculum reform, thus failing to demonstrate linguistic agency after all the effort he made. In terms of symbolic interactionism (Tang Wee and Margery' stance), Daley appears to express *role distancing* (Goffman 1961)—detachment from an agentive role, a defensive strategy used by people to protect themselves against the risk of failing to exhibit competence in performing a given social activity. Daley's role-distancing, in particular, appears to be a defensive measure

against potential failure to make the chemistry curriculum inquiry-oriented while maintaining student performance (i.e., grades and AP scores) high. The potential for such a failure was particularly evident in the spring of 2009 when Daley scorned the students for their decreasing grades in the weeks preceding their AP examination. In my opinion, Daley's role-distancing constitutes a surprising and somewhat disappointing conclusion to his quest for a chemistry curriculum that was more inquiry-oriented. It suggests that his reform efforts were to a certain extent neutralized or canceled out by reproductive, self-perpetuating socio-cultural forces within the STEM schooling social structure (mainly the pervasive expectation and prioritization of high student AP scores). These forces seem to lead Daley to reconsider and alter his innovative vision of inquiry instruction, shifting its meaning back toward the more traditional forms of AP chemistry instruction that already existed at Innova Academy prior to his initiation of a reform effort (i.e., making his envisioned chemistry curriculum more closely aligned with the prevailing educational *status quo*).

Agency as role-taking

It is important to point out that symbolic interactionism favors a dramaturgical perspective on social life by resorting to theatrical concepts such as "roles" as a means to analytically account for human interactional behavior (Brisset and Edgley 1990). Human life is metaphorically seen as theater and people as performing actors who play roles and enact dramas (social relationships) in particular stages (social settings). Moreover, *agency* is taken as one of the five key terms in dramatism, typically referring to the means or instruments used by an actor (agent) to perform an act (i.e., *how* performance is accomplished) (Burke 1969). Aligned with this perspective and particularly Goffman, Tang Wee and Margery provide an account for Daley's reform efforts in terms of the theatrical notion of "*act*[ing] *out interpretive lines in order to be in-face* [or in character]", that is, his actions are seen as performing acts consistent to different degrees with a projected dramaturgical self. This theatrical notion is theoretically equivalent to the notion of *role-taking* (Turner 1962) in the sense that it captures the need for *consistency* in social interaction, that is, the need for social actors to enact patterns of behavior that are clear, unequivocal, coherent, and consistent with prevalent organizational definitions for the self within particular social structures.

Several important role distinctions can be found in the interactional symbolism literature. Goffman (1981) distinguishes *the animator* (the person who delivers a text) from *the author* (the person who actually wrote the text), and *the principal* (someone who believes personally in what is being read). For example, it is often the case that texts written by political speechwriters (authors) are delivered by spokespersons (animators) on behalf of government officials or institutions (principals). By contrast, Karp (1986) makes a distinction between the role of *actor* (a rule-governed or rule-oriented person whose actions simply reproduce existing social structures) and the role of *agent* (an empowered person whose actions bring about transformative changes to existing social structures). And, Ivanic (1998) identifies the social role of "*originator of ideas*" (someone who owns and is personally accountable as the source of ideas being presented) in academic writing. Drawing upon these role differentiations, it can be argued that Daley's teacher agency stemmed at least partially from his transition from a social structure (a public school) that constrained his social role to a mere actor or animator of science curriculum to a more enabling social structure. The latter afforded him a more agentive organizational definition as a principal and author of science curriculum—someone who was personally and

volitionally invested as well as actively involved as an originator of ideas in the (re)design of the science curriculum being implemented.

Tang Wee and Margery's examination revealed that, for Daley (and likely other teachers in similar STEM schooling contexts), to be a social agent of inquiry-oriented science curriculum reform means performing a large *role-set*—a cluster of social roles assumed by virtue of one's organizational position (Merton 1957). More specifically, Daley's curriculum reform drama required him to play a wide set of agentive social roles, including a visionary presenter, a team leader, a curriculum rewriter, a classroom instructor, an advocate and coach for AP success, and a public self-evaluator. Acting from the perspective of these multiple agentive roles simultaneously could be a challenging task within school social structures (both public and specialized STEM) where science teachers are typically expected to play a single formal role (most commonly actors or animators of science curriculum) prescribed by a clear organizational definition. As emphasized by Turner (1962), "[human] *behavior is said to make sense when a series of actions is interpretable as indicating that the actor has in mind some role which guides his behavior*" (p. 23). For this reason, Daley's enactment of multiple roles had the potential to lead to not only role-conflicts but also loss of role clarity, consistency, and coherency, thus rendering his curriculum reform actions less interpretable and identifiable to other stakeholders.

Agency and authorship

Another important aspect of agency is with regard to authorship and responsibility. Scholars of bureaucratic social activities in government organizations have previously described how collective agency is semiotically constructed through bureaucratic processes that promote diffusion of individual authorship (i.e., prevent precise specification of authorship or attribution of responsibility). Hull (2003) provides a detailed analytical account of the semiotic process of fabrication of collective agency mediated by multiple officers' engagement with written files circulated in Pakistani institutions, a bureaucratic process documented in writing through authorless and impersonal dialogic discourse—typed or handwritten records such as notes and commentary—that do not reveal the individual identity of bureaucrats or functionaries behind a particular proposal or decision. In sharp contrast, it is noticeable from Tan and Margery's case study that, despite the participation of multiple stakeholders (colleagues, school administrators, students, parents, etc.), the curriculum reform initiated by Daley never appeared to evolve into a collective effort, for the most part remaining an individual educational project whose authorship and responsibility was solely attributed to Daley. Put differently, Daley's individual agency and authorship did not diffuse and the interactional micro-processes of meaning-making engaged by him, other stakeholders and external reviewers did not result in the emergence of collective or distributed social action.

The importance of agency and dramatism for science education

The main significance of Tang Wee and Margery's work is that it provides science educators with a more sophisticated and clearer understanding of agency—as a socioculturally mediated capacity to transformatively interact with educational social structures—which can help us better understand the micro-processes of social reproduction and social

transformation that can constraint or enable teachers' efforts at being social agents of inquiry-oriented science curriculum reform. Moreover, it highlights that, like other forms of human agency, teacher agency "extends beyond the skin" (Wertsch, Tulviste, and Hagstrom 1993), that is, teacher agency is not located inside the mental processes of individual teachers (i.e., teacher-initiated school reform is not simply a matter of decontextualized, rational choice) but rather it emerges in teachers' sociocultural interactions with existing school social structures, being meditated by semiotic tools such as language and discourse. Teacher-initiated school reform involves complex meaning-making activities around terms such as *curriculum reform* and *inquiry curriculum*. It also requires coping with institutionalized reproductive loops as well as multiple and often conflicting pedagogical motivations, educational beliefs, sociocultural norms, and sociopolitical factors.

Tang Wee and Margery's symbolic interactionist study (to the best of my knowledge, the first of its kind in the science education literature) also paves the way for novel theatrical or dramaturgical understandings of science curriculum reform efforts. By adopting a dialogic model of social change based classics such as Goffman's (1959) *The Presentation of Self in Everyday Life* and Blumer's (1969) *Symbolic Interactionism*, Tang Wee and Margery embrace a dramaturgical perspective that, as described by Brisset and Edgley (1990), emphasizes that "*to be a human being is somehow to be involved in a life that has a remarked similarity to the things of the theater* [stage]" (p. 36). Most fundamentally, such perspective considers science curriculum reform as being in many ways analogous to theater (i.e., as having dramatic qualities and being composed by a series of performances). Like revising or adapting a theatrical play, reforming a science curriculum also often entails script rewriting, role (re)making and taking, role adjustments, stage and scene alterations, and sometimes even prop failures. For this reason, science educators interested in curriculum reform can benefit from dramaturgical analyses centered on theatrical metaphors and analogies which are likely to offer sophisticated understandings and valuable new insights into the sociocultural complexities and contradictions behind the many masks that science teachers have to wear, and parts they have to play on the science classroom stage during self-initiated inquiry-oriented reform efforts.

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