PERSPECTIVES OF SCHOLAR ACTIVISM, PRAGMATISM, AND ORCHESTRATION IN SCIENCE EDUCATION

This symposium proposes ideas not normally considered during formal sessions of NARST. We offer an alternative form of scholarship that considers and proposes possibilities for the very future of our discipline. Although this year's conference theme, *Impact of Science Education Research on Public Policy*, gives a sense that we are active in the application of our work a quick look at the strands offered by our very organization shows nothing in terms of action, effecting new policy, or considering the impactful practices within our discipline. This symposium offers an opportunity for us to critically analyze what we do, how we do it, and towards which goals we honestly strive. Specifically, we consider the examples of scholar activism, pragmatism, and orchestration as modes that we must explore as a discipline in order to take responsibility for the effect of our work.

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Introduction

Science education is a field that is both diverse and complicated. We host scholars and studies with multiple theoretical perspectives, multiple methodologies, and multiple inquiries. Additionally, what we do takes on an importance (we hope) that goes beyond basic research. What we do should shape policies on a broad level as well as advance the learning opportunities of individual children. That is, our work in education aims to empower current and future citizens and the arena in which they enact democratic responsibilities and privileges. We work in education because of its societal imperative, in addition to using it as a source of scholarship.

While inspired to change the world, as teachers and scholars, educators and researchers, we have received little training to make good on such intentions. Our educational expertise (both formal and informal) tends toward a list of pedagogical helps, some educational theory, and a measure of research methodology. Good intentions notwithstanding, we do not have the tools or models from which to work that will create the impact we desire. The hope that researchers and teachers themselves have sufficient knowledge and wisdom to change society is perhaps becoming less realistic as social inequities persist, science non-literacy prevails, and reform efforts plod along.

The onward march of the years towards 2061, a date that our community purportedly established as our deadline for reform (AAAS, 1990), seems to be approaching faster than our progress advances us.

An unspoken premise of our organization offers help and hope in the realm of science teaching. Within this group, together with some hundreds of other scholars and educators from around the world, we share the desire to create a change – for the better – in our educational systems and in the lives of our students and citizens. The theme of this year's conference, *Impact of Science Education Research on Public Policy*, demonstrates the deliberate intention of doing something as an organization that will generate more than a new research methodology or a novel pedagogical tool. Rather, our intent is to change the very structure of educational systems in order to improve things from the top, down. The problem we all face, though, is that most of us really have no idea about how to do such a thing. Even while undoubtedly good intentions from unquestionably well-intentioned scholars place this *impact* theme across the cover of our conference program, we should admit that we have only a vague notion about how to initiate such. We run the risk of wearing this theme just as the emperor wore his "new clothes" in Anderson's classic tale (2004).

Four years ago, two of the authors in this symposium (Settlage and Johnston) created an alternative conference in science education called *Science Education at the Crossroads*.[1] The conference continues today, and is currently in the midst of planning its fourth gathering. By itself, *Crossroads* does not aim or even theme itself towards *impact* as this year's NARST conference does. However, its interactive format and generation of new ideas and pursuits opened up the themes and possibilities by claiming that our work should become more active in our society, especially within local arenas. This commitment emerged from conference participants themselves, and became expressed at specific points in time by three keynote addresses. This symposium revisits the themes of the Crossroads' keynote talks and their continued used at *Crossroads* in the hope that they offer one set of ideas as to how *impact* can be made possible. They offer models by which to frame our work.

First, we offer a vision for how we might work as *scholar activism* (first brought to *Crossroads* by Moss [2005]), which suggests that our standard partitioning of research, teaching, and service within the academy is stagnate and suffocating. This perspective urges us to reconsider the very purpose of our work as individuals and the structure within which we work as an academy. Second, the philosophical stance of *pragmatism* (introduced by Settlage [2006]) offers a foundation that supports the ambition of scholar activism at the individual level. It appeals to our senses and aesthetic, rather than a narrower view of the mind, and their use towards doing work. Third, various examples of *orchestration* (suggested by Johnston [2007]) are introduced as ways by which the collective can work together to effect change in our field and beyond. We offer these as new possibilities with which to structure cooperation within our discipline.

Acknowledgments

As described above, the work presented in this symposium reflects themes from *Science Education at the Crossroads* in 2005, 2006, and 2007; and our concluding piece in this symposium is a prelude to a presentation to be made in 2008. Although each of these

[1] See http://www.sciedxroads.org

presentations was an individual presentation, they are all the result of countless interactions with the communities represented at the three gatherings. We gratefully acknowledge those individuals who have encouraged, provoked, and helped us, knowingly or not, to develop these ideas: Eric Amsel, Janice Anderson, John Armstrong, Kip Ault, Barbara Austin, Jimmy Santiago Baca, Michael Barnett, Lloyd Barrow, Meredith Beilfuss, Todd Bevis, Francis Broadway, Michelle Brown, Malcolm Butler, Mary Anne Butler, Cory Buxton, Brad Carroll, Robert Ceglie, Amy Cox-Peterson, Kathy Crooks, Dina Drits, Don Duggan-Haas, Mark Enfield, Steve Fletcher, Larry Flick, Anne Pfitzner Gatling, Barbara Gentry, Magnia George, Ron Good, Ellen Granger, Jonathon Grooms, Carol Artacho Guerra, Heather Harkins, Kurt Haste, Michael Haudenschild, Thomas Higginbotham, Meredith Houle, Man Hung, Andy Hurford, Jon Jackson, Murray Jensen, Eugenia Johnson-Whitt, Julie Kittleson, Catherine Koehler, Michele Lee, Yingjie Liu, Julie Luft, Sharon Lynch, Taylor Mali, Kathy Manning, Jacqueline McDonnough, Lee Meadows, Duane Merrell, Janice Meyer, Sherry Mitchell, Felicia Moore, Marilyn Nelson, Sharon Ohlhorst, Steve Oliver, Mark Olson, Stacy Palen, Eileen Parsons, Diana Payne, Cindy Sabik, Al Schademan, Jim Shymansky, Leigh Smith, Matthew Smith, Mike U. Smith, Sherry Southerland, Scott Sowell, Courtney Tucker, Bhaskar Upadhyay, Paul Vellom, Elizabeth Werner, Li-Ling Yang, Jason Yurcik, and Michele Zwolinski.

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I. IN SEARCH OF SCHOLAR ACTIVISM

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My first brush with activism came as a small boy, specifically at my father's college graduation more than 35 years ago. I recall only three things about that day, but all three memories are indelible in the way only memories from one's childhood can be. My first memory is how hot it was that day at the out-of-doors ceremony. Not merely hot, but a feel-the-heat-on-your-face kind of hot that made me want to shield my eyes. Second were all the graduates dressed in black – an endless sea of black robes and pointy hats that seemed a bit scary through the eyes of a child. My third memory should have been frightening to me at the time, but the soldiers stationed on the roof of the adjacent building with their M-16's seemed like those little green army men I was so fond of, and given that frame of reference I remember being curious but not alarmed. It was not until years later that such enduring memories prompted a question or two for my parents, and I learned that this ceremony took place shortly after the killings at Kent State in the spring of 1970.

My next encounter was more experiential and came when I was in high school in the early 1980's. Along with my best friend we wanted to take a stand against what seemed a lack of policy or diplomacy with regard to what was known as the Hostage Crisis in Iran. We planned a school-wide walk out to begin in the passing time between classes. Talking it up with everyone we knew in the days prior, we envisioned bursting out the front doors of the school and rallying at the flag pole chanting slogans borrowed from the evening news. However, word travels fast in high schools and we found ourselves called to the Principal's office shortly before the planned walk out. I'm still astonished and encouraged by the response of the administration as we sat in the school office and received supportive logistical advice to ensure no one would be injured, and were even offered names of a few teachers who might like to say a word or two. Although the protest lost its edge of being a rebellion per se, for a brief moment as a teenager I felt as if I had a voice and could perhaps make a difference.

That feeling of making a difference has stayed with me all these years, and in no small way helped me find my path to the professoriate. Perhaps like many future academics, when considering career options I found myself drawn to professions that seemed to serve society in some small way. My childhood encounters with activism forged in me a sense of justice and leadership which has driven my professional ambitions. Articulating a sincere interest in a career in which I could engage in work that was meaningful to me, a mentor of mine explicitly steered me to life in the academy. But what did I really know about being a professor?

Academia as a profession has a rich tradition that is often misunderstood by the general public (Graff, 2003). Pure research, that which is done for its own sake, is the foundation for new knowledge and is likely a distinctive product of our humanity. We are curious, and this curiosity feeds our pursuit for understanding, sometimes without any need for a particular application (Lightman, 1996). This same characteristic likely spurs our species to create works of art, perform symphonies, and write plays. However, in a society when certain needs (education, equity, health care, etc.) are compelling and urgent, simply pursuing knowledge for its own sake may be a luxury derived at the expense of engaging in something more active and influential.

In academia, our system for educating graduate students, qualifying for an academic position, and gaining tenure and promotion at a university implicitly trains us to produce scholarship of a limited variety. Activism or application of our scholarly work, while not necessarily discouraged, is not explicitly encouraged. Therefore, we train ourselves to graduate from student to assistant professor and from assistant professor to tenured faculty; yet after this investment many of us may have little to offer in terms of active application of our research. This was certainly the case for me, and although post-tenure I found myself to be a productive scholar per se – my work seemed to lack a greater purpose. A sabbatical afforded me the opportunity to consider why it was I wanted to be a professor in the first place.

Even given the remarkable, diverse, and numerous contributions that universities make to society, I am profoundly disappointed with the lack of progress of educational reform given the unrealized potential of the tens of thousands of professors like myself who engage in some form of educational research each and every day. The following quote, which I first read in a book titled *Ecological Literacy* by David Orr (p. 151, 1992), sums up my feelings quite succinctly:

> The vast majority of research turned out in the modern university is essentially worthless. It does not result in any measurable benefit to anything or anybody. It does not push back those omnipresent 'frontiers of knowledge' so confidently evoked…it is busywork on a vast, almost incomprehensible scale. It is dispiriting; it depresses the whole scholarly enterprise…. (Smith, 1990).

Although one might argue that the very nature of universities today, including the drive for national rankings, squeezed budgets, the prominence of intercollegiate sports, etc…share much of the blame for any unrealized potential, the bottom line is that faculty are the very heart of a university. We are in command of the curriculum, set our own research agendas, and mentor candidates into the profession. Any accountability must surely rest squarely on our shoulders.

Given recent data about graduate training and higher education faculty compiled by the American Association of University Professors, perhaps it is not surprising that many professors struggle to make their work relevant and effectual (http://www.aaup.org/aaup). The number of full-time, tenure track faculty has plummeted in recent decades as universities hire contingent, often part-time, faculty as a cost saving measure. Presently, less than 40 percent of all faculty in higher education are in the tenure stream. AAUP membership that once topped 120,000 in the 1970's, now hovers around 45,000 today (Nelson & Watt, 2004). That is, there are fewer and fewer of us around who are fully invested in the longevity of our universities, especially the missions of outreach and service. The very construct of a *faculty* has eroded over time.

Since the 1960's the attrition rate from all PhD programs has been nearly 50 percent, squandering vast faculty resources (Nelson & Watt, 2004). Although many have been calling for the re-thinking of doctoral preparation, it remains relatively unchanged in more than a generation. In order to help ensure scholarship which does in fact push the frontiers of knowledge and results in a measurable benefit to those sectors of society with the greatest need, we must be strategic in our thinking about doctoral preparation and subsequently nurture the necessary support structures across the professional lifespan so that risk taking and advocacy may flourish as a routine element of learning to be a professor and ultimately in accepting the responsibility of being one.

I have advocated for an increase in tenure-line positions here at my home institution, and believe the protection afforded by academic freedom is a necessity for scholars to pursue important,

timely, and sometimes controversial work. Although thought of merely as job security by those outside the academy, the earned privilege of tenure is much more about ensuring faculty can serve society to their greatest potential without interference from an often capricious administration. Presently, however, I can best describe the tenure process as one of perform and conform.

No longer should we reward faculty for teaching the usual subjects in traditional ways, and producing large volumes of mediocre and repetitive research. Quality, advocacy, innovation, and impact all should matter to those of us immersed in academic life. As faculty, particularly as tenured faculty, we must be willing to step up and advocate for a system which rewards risk taking and the tremendous effort of advancing an agenda and seeing it all the way through, regardless of artificial metrics such as the numbers of publications in a given academic year. I am not advocating for lowering the bar in terms of faculty productivity – in contrast, I see the threshold for earning tenure and promotion to be consistent with the high ideals of true accomplishment and service. A single, seminal article will yield more in terms of both advancing a line of thinking and enhancing the reputation of the scholar and university than any series of marginal publications, no matter how voluminous. I am calling for a renewed vision of the professoriate beyond the prevailing model of faculty who work in insulated and conventional ways. A genuinely high bar indeed.

One counter-example of such conformity may be seen in the tale of Dr. Cornel West. His prestigious, yet at times contentious, academic career not only produced influential books (including *Race Matters* [West, 1993]) but managed a consistent effort to bring his work to the widest possible audience. This, in addition to his political activism, makes him both applauded and critiqued. Dr. West was, and still is, criticized for bringing his work to the public forum in accessible forms, and this, in part, eventually led to his leaving a University Professorship at Harvard for a more supportive environment at Princeton.

While there are numerous interpretations of Dr. West's story, it is clear evidence that a departure from traditional scholarship is likely to be met with resistance. Yet, the difference that Dr. West has made in society is likely much greater and broader than what would come from a long list of publications relegated to expensive and obscure journals buried in vast library holdings. Clearly, a problem exists in the separation between what most of us do as academics and what popular culture has access to and finds important.

Although a typical academic position has a degree of service required, this is typically a minor portion of one's responsibilities. (I am told by temporal physicists that committee meetings just *seem* like they last forever.) The cornerstone of academic life has been the triad of research, teaching, and service with emphasis placed on either teaching or research depending on the institutional mission. Additionally, service is typically limited, finding its efforts funneled into serving on a university committee or the peer review of scholarship to be presented or published, thus further segregating our daily work from deeply impacting a greater community. Service is typically a category that is distinct from teaching and research, further encouraging its disconnectedness from the other work we do.

To alleviate the disconnectedness of our work from society and to bridge the divide between our research, teaching, and service, I encourage the alternative model of *scholar activism*. I propose that this hybrid category should not only exist to draw connections between the habitually discrete elements of the triad, but to bring into our tradition the idea that scholarly work for its

own sake is not enough in the field of education. Rather, a new effort must be brought about to infuse research into service and ensure our service genuinely informs our teaching, tying these together in inextricable ways. *Service through scholarship* should be the rallying cry for faculty who want to make a difference.

In *Office hours: Activism and change in the academy* (2004), Nelson and Watt describe what they refer to as the tenured vampire, those established faculty who exploit the academy and squander the privileges of their position. These individuals essentially live off the system of adjunct instructors and graduate students, hording precious resources in terms of salary, benefits, travel, etc., and giving precious little back. They feel entitled to what they have earned, and in many ways they are, but somewhere along the way they have selectively forgotten the words uttered during the conferring of their degrees which spoke not merely of rights and privileges – but of responsibilities. Nelson & Watt argue that "universities cannot promote enlightenment values unless they exemplify them" (p. 39), and I would once again remark that this responsibility resides with the professoriate.

But where do we begin? As graduate students we are taught to consider what is important to the field, or some narrow segment of it, and I offer that we might also explicitly ask what is important to society. Consider what urgent topic deserves your attention. Interestingly, many young scholars have articulated that they are not yet ready to take on such heady questions, perhaps still fine tuning their methodologies, but more than likely they are afraid to fail by biting off more than they can chew. When risk taking is discouraged, getting to the next step becomes the singular focus. But the notion of engaging in timely and urgent work in service to society need not be contemplated on such a vast scale that the logistics become a very real barrier to move from ideas to implementation. The environmental movement got it right when they noted one should think global and act local. I encourage the idea of starting by acting very local – perhaps even at our home institutions.

Perhaps given my experiences in my youth, I used to think of activism as something that only happened on a national stage, or at least involved national or global issues. Throughout my years as an assistant professor, I fell into the trap of waiting until I was tenured until I could take on the "big issues" in education as defined by those in the popular media. I recall holding my tongue at a regional meeting which advocated superficial and somewhat absurd strategies for schools to improve their scores on standardized tests. (Student chanting during lunch periods in the weeks prior to the test stands out among a suite of shallow advice). At the time, I believed this issue to be a bit out of my league, and I regret not adding my voice to those who offered reasoned and thoughtful arguments opposing such trivial recommendations. There are two lessons to be learned from this real world example; the first is for those early on in their career and the second for those more senior.

As graduate students or early career faculty, it is hard to see that our advanced preparation and commitment to research gives us clout. What power we hold through our status must not be squandered on every little incident which may arise, nor should we gallop in on our white stallions to venues in which we perceive injustice. But reasoned, appropriately conveyed and substantiated arguments offer us the potential to have significant impact on issues of import to us. Perhaps following the lead of others, seeking advice when appropriate, and listening as much as speaking will help guide the novice scholar through politically charged and precarious territory. On the other hand, it is the responsibility of senior faculty to not merely be out in front as an advocate on issues which resonate with them, but to serve in a leadership capacity which

demands they forge a safe venue for all voices to be heard. This tremendous responsibility demands one be selfless, open-minded, and tolerant. Advocating for those who for whatever reason cannot or are not advocating for themselves is a responsibility those who have earned tenure should embrace. The very protections guaranteed by the tenure system demand nothing less.

I have perceived a growing movement in recent years to re-consider what it means to bring about impact. What has become clear to me is that the traditional notions of writing up research articles for publication is simply not sufficient in terms of advancing the idea of scholar activism. Thus, the notion of service through scholarship affords one the potential to both generate scholarly products which are indisputably the coin of the realm in academia while concurrently promoting change within and beyond the ivory tower by making our work accessible in non-traditional venues and better yet, directly engaging as change agents. This is particularly true for those of us who work on the field of education. There seems an endless list of issues, both big and small, which demand our immediate consideration. This may not be true for all scholarly pursuits, where a more traditional life of the mind does not leave pressing issues unattended. For professors of education, the life of the mind must be a catalyst for a life engaged.

In science education, countless numbers of students experience science as a discipline solely characterized by the memorization of hard to pronounce definitions of technical terms. The endless coverage of trivial science content is disconnected from their daily lives. The notions of informed decision making in a democracy and improving the quality of one's own life are rarely explicitly addressed through the science curriculum (Moss, Settlage, & Koehler, 2008). Given the challenges and moral dilemmas underscored by such contemporary issues as global change and biotechnology, we cannot afford yet another generation of students to pass though schooling without offering them the skills, knowledge and habits of mind necessary to consider the very real implications of such issues. Science education researchers working directly on such reform-minded efforts, advocating at all levels for significant shifts in curriculum and associated testing regimes, can substantially impact the very nature of science education while at the same time redefine what it means to be a scholar.

Ideally, such a transition from a sheltered existence in the halls of the academy to one balanced with service through scholarship, will serve to transform the very nature of the profession. As tenured faculty, although in smaller numbers now than in recent decades, we retain the promise to revolutionize the rules of the game. Changes can be immediate and far reaching if we have the will to bring them about. We can ensure that doctoral programs prepare candidates for the renewed reality of participatory public service by reconsidering the qualifying exam and nature and purpose of the dissertation. We can support new faculty in ways that encourage quality over quantity in their publications. We can demand that they firmly establish the value and worth of their efforts as an integral element of the tenure process. We can document in what ways they rolled up their sleeves and engaged in the work their predecessors merely wrote about. Our reward systems must be consistent with this re-vitalized vision. A small window of merely a generation or so is all that remains to implement these changes. Beyond that I fear the tenured professor with a powerful voice in issues of faculty governance – that is, those faculty entrusted with well being of the academy – will be relegated to history.

All is not lost, but now is the time to act. After all, activism at its root calls for us to *act.* As I have touted this work in various venues in recent years I am sometimes met with resistance and skepticism. I am labeled an alarmist or worse, an idealist. Although the hard data regarding the

nature of faculty appointments should speak for itself, many seem content to believe that such an undermining of the profession with conditional appointments simply couldn't happen on their watch. Perhaps they are too busy playing the game, and winning, to be concerned with changing the rules.

But I am most concerned with those who find it challenging to envision what life as a scholar activist would look like. They articulate a perceived incompatibility of these notions. For them I have often invoked…

Xena: Warrior Princess[2]

Even though the example may be a bit out of the mainstream for much of the academy, it actually works on several levels. Although not really a fan of the television show which ran in the 90's, I do know that the lead character of Xena was renowned for standing up for those who did not have a voice, although in her case the sword was mightier than the pen. Additionally, she often had a sidekick with her on her travels, whom she carefully mentored in an experiential way. Finally, and most important for bridging the gap between the what is and what could be, if such incongruent notions as embodied by a traditional fairytale princess can be blended with a fierce warrior and leader, I hold hope that we can envision life as both a scholar and advocate. We must, as much depends on it.

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[2] See http://en.wikipedia.org/wiki/Xena

II. PRAGMATISM AS A PROFESSIONAL POSSIBILITY

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Rapidly changing demographics in public schools and the recent politicizing of America's educational system creates uncertainties for many science educators. The imposition of standardized testing and the associated restrictions upon instruction makes us feel, individually and collectively, as if bullies have showed up on the playground and they have taken away our ball. The frustration this creates extends beyond the edges of our campus by limiting our classroom colleagues from providing authentic opportunities for K–12 students to learn science. These circumstances create tension as the academic triumvirate of service, teaching and research pulled college faculty into directions that are more public and political than one typically associate being a science educator. Nevertheless, a small segment of the science education community feels drawn into action.

The juxtaposition of scholarly dispositions and activist tendencies seems unusual within science education. After all, activism is more commonly associated with feminist scholars, environmental defenders, and those concerned about globalization (e.g., George, 2005). Furthermore, the workplaces of most science educators have not been historical hotbeds of political activity: "the mission of traditional White universities has not been service, uplift, and liberation for racially nondominant groups or the economically poor" (Benjamin, 2000, p. 74). In short, a typical state college or land grant university is not where one expects to hear of faculty who rally around unifying ideals such as social justice. Even thought unexpected, there is interest among some science educators to self-identify as both scholars and activists.

It is revealing to discover the existence of scholar activism in a previous era of educational innovation. As reported by John Rudolph (2005), the "general science" high school course burst onto the high school scene in the early twentieth century as an effort to give students an appreciation of science and to help students develop their skills at applying scientific thought into their daily lives. The general science course emerged at a time in which high school enrollments were skyrocketing but enrollments in science courses were dwindling. The faculty and forces involved with this movement are adeptly depicted in Rudolph's 2005 article. But for this moment and space, an essential feature of that story is embedded in the following quote:

> Chicago possessed a unique combination of factors that gave the movement a coherence and reach that it would otherwise have lacked. Central to this coherence was a tightly knit local network of ***scholars*** and ***activists*** who shared ***an intellectual framework*** within which science teaching as a whole and general science in particular were effectively reorganized (p. 370, emphases added).

This becomes the crux of our immediate concern. While becoming active in public events and policy decisions may be admirable, I am arguing that a guiding force is a vital ingredient. Otherwise, activism may only draw upon impulses but not also endorsing the need for direction. Here I do not propose along which paths an activist ought to travel. Rather I want to suggest that developing an appreciation for combining desires with directions is crucial within such

endeavors. As reflected in the historical record of the general science movement, a holistic and unified framework was combined with the drive to take action and this becomes a model for contemporary scholar activists.

The energy for activism often arises from an intangible drive to do something. A sense of frustration, the perception of opportunity, or a sensation of injustice — all are compulsions that can spark action. Too often, it seems that the compulsion to do is not mediated by a guidance system. I suspect that learning to sail a boat is challenging, but not because it is hard to cause a boat to move. The elation a novice sailor probably feels when the sails fill with wind and the boat begins to move is quickly replaced by the abrupt need for knowledge about steering the craft. But even with the value of knowing how to navigate, none of this is of much use until the vessel is caused to move. Indeed, Dewey (1938) wrote: "Desires are the ultimate moving springs of action" (p. 70) and so before one can move toward becoming a scholar activist, there must first exist a heartfelt compulsion to act. For many there is visceral appeal to the idea of an academic using his or her professional knowledge in a service capacity. The label of "scholar activist" stirs an excitement that allows an academic to feel they have Xena-like powers. The television character Xena is known as a "warrior-princess" — a delightful juxtaposition of disparate roles: a weapon-wielding warrior blended with the bearings of royalty, a certain amount of toughness blended with a feminine tenderness. Likewise, a scholar activist evokes a blending of wisdom and righteousness. However, according to online plot summaries, Xena's character wandered about looking for adventures, perhaps to redeem herself for past errors. Over time, she became more clear-eyed about the roles she might play in world. Desires can spring someone into action; in effect the heartfelt motives translate into handiwork. But the benefits of mindfulness, as in "a receptive attention to and awareness of present events and experience" (Brown, Ryan & Creswell, 2007), serves as the steering wheel that works in concert with the thrust provided by an engine. In scientific terms, activism can be equated with speed while the scholar activist is equivalent to velocity: speed and direction.

Pragmatic Philosophy

Dewey cautioned against overemphasizing activity as a goal unto itself. He stressed that an intelligent force must be applied to inform the impulse to act as well as to usher the activity toward its intended purpose. "The intellectual anticipation, the idea of consequence, must blend with desire and impulse to acquire moving force" (Dewey, 1938, p. 69). This differentiates the two meanings of pragmatism of the practical versus the philosophical. Someone following a practical sense of purpose does so from the desire to make things happen and to get things done. In contrast, a pragmatic philosophy describes the individual who values the integration of ideas with action. The distinction is within the driving forces for activity. The purposes could be distinguished as either impulsive or intentional. Furthermore, the activity informs the mind by providing an ever-clarifying sense of purpose and direction. Dewey (1938) explained that reflective thinking "gives direction to what is otherwise blind, while desire gives ideas impetus and momentum" (p. 69). Thus, activity becomes more than a notion put into motion. The desire serves as the impetus, the activity informs the mind, and the mind shapes to the next action. Scholar activism has its roots in a perceived need to resolve "perplexity, hesitation, doubt" (Dewey, 1910, p. 9). In a sense, the starting point is a matter of the heart. What is further needed

is to bring the mind into its rightful role as a perceiver and guide as the action gets underway. Pragmatic philosophy offers a helpful representation of such a combination.

Social reformer Jane Addams was an activist figure cut from an explicitly pragmatic fabric. Quoting Addams' 1902 book *Democracy and Social Ethics*, Fischer (2006) associates pragmatism with a particular type of responsibility: "We are under a moral obligation in choosing our experiences, since the result of those experiences must ultimately determine our understanding of life" (p. 79). Experiences and understandings, or knowing and participation, are linked to each other and some would go so far as to suggest that it may be impossible to distinguish the two (e.g., Lave & Wenger, 1991). This is the manifestation of pragmatic thought. The activism of Addams is above reproach with her founding in 1889 of Hull-House in Chicago. Situated in the heart of a neighborhood bursting with recent immigrants, Hull House was created to provide educational, civic, and social support to the poor. This form of activism completely eliminated distinctions between philosophical thought and political action. The well-deserved admiration highlights the uniqueness of Addams – and exemplifies the highest manifestation of pragmatism.

Pragmatism as a philosophy has undergone a rebirth. Morris Dickstein's edited text *The Revival of Pragmatism* updates about pragmatist philosophy and documents its influence upon society as well as supplying a useful entry point for those who have not been formally schooled in pragmatic philosophy (Settlage, 2006). More recently and more accessibly (if being a Pulitzer Prize winner is any indication) is Louis Menand's (2001) *The Metaphysical Club* in which he traces the origins of pragmatic philosophy via biographical sketches of those who initiated and nurtured this distinctly American way of thought. Also, for those who wish to pursue another popularized account of pragmatic philosophy, Robert Richardson's 2006 biography of William James gives intimate insights into one person's efforts to articulate pragmatism and bridges the nineteenth and twentieth transformation — a process that subsequently energized and informed John Dewey. In each of these texts, at least for this reader, pragmatism reveals that it is difficult to comprehend by a direct approach. Illustrations of the idea are at least as important as being provided with a definition. Because Dickstein (1998) so capably selected contributors to his edited volume, we will enter into a consideration of pragmatism by a less direct route. Using art as beginning point, we can apprehend the power of pragmatic philosophy as well as recognizing how it enlightens the path for a scholar activist.

Portraits of Heart, Hands & Head

The paintings of Thomas Eakins grace the walls of art museums around the United States. Humans are the subjects of his paintings and he portrays them in muted colors. In fact, his portraits are somewhat dark, dominated as they are by shadows. With other artists, this might give a brooding effect, but with Eakins the subjects are captured in moments of intense thought. The accompanying artwork titled *John Biglin in a Single Scull* (1874) provides an object lesson in Eakins portraiture. John Biglin was a legendary sculler and a well-known athlete in an era where sculling was quite the rage. Here he is portrayed at the start of a powerful stroke. Arm muscles are prominent and his eyes suggest that his mind is fully engaged in what his hands are about to do. These boat are notoriously unsteady which creates a great tension between the goal of remaining afloat even as one endeavors to move along the water's surface at the greatest possible speed. More than just someone out to row on a sunny day, Eakins portrayed a supremely

skilled individual at the instant in which his head and hands were perfectly aligned. The background is plain and indistinct so our gaze is pulled toward the person. We note his reflection in the foreground, perhaps signaling that the athlete is engaged in Schön's "reflection-in-action." The rower is not contemplative nor is he demonstrating pure physicality. It is to these representations that essayist Ray Carney (1998) argues that pragmatic philosophy is embodied in Eakins' portraits.

Carney's chapter *When Mind is a Verb: Thomas Eakins and the Work of Doing* appears in Dickstein's (1998) edited book about pragmatism. Carney asserts that mindfulness is summoned by Eakins. Carney describes this moment as the "stunning equation of mental and practical power, as if there were no inherent obstacle in converting the one into the other. That daring leap of faith from mind to matter is the heart and soul of the pragmatic position and the deepest connection between Eakins' work and pragmatic philosophy. Seeing, being, and doing merge," (p. 385). Art connoisseurs attach considerable significance in Eakins paintings: the tilt of a person's head, the direction of their gaze, the ways in which the hands are portrayed, and the areas emphasized by spots of light. Here then is what pragmatism represents: an elegant combination of heart, hands and head within a purposeful activity which is compelled, informed, and guided by the interplay of impulse, activity, and intelligence.

The ideal of a scholar activist depicts the response to vexations arising within the mind of the thoughtful individual. However, the tug on the activist is often unable to sustain intellectual activity. In contrast, a scholarly stance is often insufficient to compel one to action. In fact, the emphasis upon contemplation may impede a capacity to act. The activist feels a compulsion to move while the scholar seeks clarity (and certainty) before taking a step. The scholar activist represents that alternative to between the two extremes, or, as Dewey (as quoted in Prawat, 2002) might well have described it: "There is an alternative between anchoring a boat in the harbor till it becomes a rotting hulk [habit] and letting it loose to be the sport of every contrary gust [impulse]" (p. 869). The philosophy of pragmatism offers a representation and a method that offers purposefulness to one's tasks. An analogue to the rower is the intelligent person driven to undertake a venture and proceeds with a clear sense of purpose. Further, this purposefulness is not fixed. It is readjusted in response to perceptions gained by being active. Just as Biglin shifted his weight, adjusted the pull, and corrected the steering, a pragmatist combines perceptions, intuition and thoughtfulness within activities.

An Intellectual Component to Activity

In a process paralleling the application of a theory to frame and guide a research project, pragmatism is being offered as guiding principle to shape an individual's role as a scholar activist. More than a platform to stand upon, these intellectual tools aid in the interpretive process. While research reports may fail to articulate a theory there are equivalent dangers with undertaking activity without a clear sense of purpose. Education professionals ought to not only ground their work in an explicit framework but should draw upon it to interpret new information as projects move forward. Just as Dewey indicated, the desire, actions and consequences must

work together. Desire suggests what we should do. But once that is hitched to intelligent purpose, then it becomes evident what it is that we must do.

What is particularly salient for our discussion is the value of experience within learning. Pragmatists place experience at the center of their philosophy and have little tolerance for lives that avoid or deny the value of experience. Emerson (1849), who many regard as a proto-pragmatist, wrote: "the hour is too precious to be wasted in other [people's] transcripts of their readings" (p. 57). A crucial feature of pragmatism is that experience is not simply the basis for learning. In science classrooms, we often emphasize the need to build upon children's background understandings — an idea that was once commonly attributed to Ausubel (1968) and is now more typically associated with funds of knowledge (e.g., González, Moll, & Amanti, 2005). However, the pragmatist views experience as much more than the foundations for building understandings. Instead, raw experience and the interpretation or denotation (Jackson, 2002) of those events become intractably tangled. Thus, a situation that induces confusion is not resolved through a negotiation between the individual and the experience but rather the intermingling — which requires us to follow Dewey in discarding the mind/world dualism (Kruckenbeerg, 2006). Confusion, uncertainty and perplexity are settled by a process described by Prawat (2002): "It is not the interaction of organism and environment that resolves the disequilibration; it is individual and situation acting together (trans-acting) that brings unity to what hitherto were disjoint elements" (p. 870). For the scholar activist who aligns him- or herself with pragmatism as a guiding philosophy, ventures into unknown territories do not simply provide raw material to load into minds. Instead the acts of navigating uncertainties within experience represents the knowledge.

Selecting Among the Variety of Experiences

Given the opportunities and obligations within the contemporary reforms of science education, it is not difficult to find experiences in which we can engage ourselves. Once we accept the necessity of being immersed within the world, locating a generative experience is less of a problem than choosing which to pursue. Even as the scholar activist is compelled by desires that speak to the heart, responding with intellect as a guiding force designates the individual who is drawing upon pragmatism as opposed to someone acting out of pure impulse. The Spanish philosopher José Ortega y Gasset suggested that we choose among possible experiential pathways based upon who we wish to become. This means that a scholar activist is designating his or her identity as an education professional and that considering the many possibilities will inform which experiences the individual should select from all that present themselves. The experiences each of us pursues will direct us toward the type of professional we might otherwise only be able to imagine: "we need to preoccupy ourselves with that work, that doing, that occupation, with what we are going to do in life, with what we are going to be. Hence, all our occupations assume and are born out of one essential occupation; the matter of occupying ourselves with our own being," (Ortega y Gasset, 1966, p. 118). Consequently, from the candidate experiences appearing before us, including those that only exist as possibilities in our minds, we should choose those that will may help us achieve our ambitions of a different self.

When describing experiences as a tool for enriching our understandings, we should guard against the common notion that experience is a commodity that we can add to a storehouse. For example, it is often said that veteran teachers are more effective than novices because of the

difference in experiences. This suggests that experience is being accumulated which leads to a form of wealth associated with greater quantity. Adding to one's experience can be used to reify understandings and confirm what is known. However, experience for the scholar activist has a discernible element of risk and uncertainty. Learning from experiences is more than adding a layer on top of what already exists because there are so many contingencies that are impossible to accurately and fully anticipate. "Certainty cannot be guaranteed in advance. The invasion of the unknown is of the nature of an adventure; we cannot be sure in advance" (Dewey, 1950, p. 150). The scholar activist, ready to advance into a venture, must relinquish prerequisite needs for certainty or suppress aversions to surprise.

Value of Surprise

For an experience to be educative, it must perturb our minds. The chances one takes by engaging in an experience where the outcome is indistinct or where there is uncertainty about how to respond are the very ventures that each of us should pursue. Many twentieth century pragmatists (e.g., Cherryholmes, 1992) acknowledge an intellectual debt to Charles Peirce who claimed: "It is by surprise that experience teaches all she deigns to teach us" (Peirce, 1998, p. 154). Herein we can recognize the value of discomforting experiences. Peirce seemed to indicate that everything to be learned from experience is because of its capacity to surprise. Taken to its logical conclusion, without surprise an experience may not be sufficient to teach us anything. Consequently, the learning potential we hope to obtain by immersing ourselves in experiences is related to the degree by which the experience puts our minds out of kilter. The disorderliness of an experience scatters our preconceived ideas and overturns our tried-and-true mental models — and becomes the necessary force for learning.

The reason action becomes a necessity for the scholar activist is because pragmatism places experience at the very core of learning. To avoid experience and to decline action effectively rejects the need to broaden one's understandings. In order to strengthen our knowledge about the world and in order to establish consistency between our views of the science learning of others and the professional learning of our selves, we would be well-served to apply similar standards. Dewey wrote, "every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after" (1938, p. 35). The centrality of experience is not simply as fuel to stoke our engines (emotionally, cognitively, etc.). An experience itself does not provide understandings; it is within our attempts to make sense of an experience that our understandings expand. Joan Scott (1991) phrased it this way: "Experience is … not the origin of our explanation, but that which we want to explain," (p. 797). The explanations that we develop to inform our practices are formed while we contemplate experiences, but the experiences do not carry the explanations.

Complementarity of Rational and Non-rational Thought

To appreciate pragmatic philosophy and recognize its potential for informing the work of the scholar activist requires the individual to look beyond rational thought. Indeed, a limit of modern science is its inadequacy when we are faced with important life decisions but this feature of science should not be perceived as a shortcoming of people who engage in scientific thinking. Richard Rorty suggests that switching between scientific and non-scientific thinking is accepted,

if not embraced, by scientists. "Post-Galilean science does not tell us what is really real or really important. It has no metaphysical or moral implications. Instead, it enables us to do things that we had not previously been able to do. When it became empirical and experimental, it lost both its metaphysical pretensions and the ability to set new ends for human beings to strive for. It gained the ability to provide new means. Most scientists are content with this trade-off" (Rorty, 2004, p. 22). Although in this essay I argue that becoming a scholar activist is a necessary consequence of applying intellect to impulse, comprehending the guiding theory may not be something one can approach as directly as we would attack a scientific problem.

One example of a non-rational entry into pragmatism was our consideration of Thomas Eakins' artwork. Another avenue for approaching pragmatist thought is offered by the performing arts. Stanley Crouch, an often contentious cultural commentator, was being interviewed about his book *Considering Genius: Writings on Jazz*. When asked to describe how jazz spoke to both the American heart and the complexities of life, his response, which loses its rhythm when converted to text, went something like this:

> It's about democratic means being used to achieve utopian ends. That is, that this group of people – who have been transformed by the "groove" – they become this utopian entity in which they achieve perfection. And everybody looks for that. Now it doesn't happen that often, it doesn't happen that often. But sometimes it's a lot of fun just to experience people trying hard to get there (Crouch as reported by Gordon, 2006).

Crouch described how a jazz musician not only develops a personal signature style but also must find ways to blend his or her stylings with the sounds of others. The individual's freedom also encourages improvisation with others to create a democratic performance. When this happens, individual voices intermingle and the combination approaches a form of utopia or state of perfection. There are features of pragmatism in Crouch's descriptions of jazz musicians: activity, democracy, and individuality. Just as with Eakins' portraits, this perspective of jazz exemplifies pragmatist sympathies. Throughout these non-scientific ways of knowing, we recognize the grand unification of heart, hands and head via intellectual activities which are propelled by desire. However, there's one last nugget of wisdom within what Crouch said that deserves our attention.

Fun is not something we typically associate with academic work. The suggestion that fun derives from the effort as much as from the fruition of activity. It is as if the venture to achieve perfection can be as valuable as the rare moments when it is achieved. The experience seems to be the key and the quality is determined by the extent to which individual talents and collaborative goals are achieved. Fun for Crouch is more than amusement; it plays a deeper chord approaching an optimal experience that some refer to as "flow" (Csikszentmihalyi, 1990). Realizing this digression moves into an appeal to the heart, it nevertheless reinforces the importance of mindful engagement in experiences in order to bolster our knowledge by supplying fresh perspectives to be resolved with what we already believe we understand. This idealized representation of pragmatism is participatory: a person remains an individual as he or she is immersed in activity while engaging in a give-and-take relationship with the surroundings. These surroundings include not only the particular space and time which provides the context for the experience for there is also the coordinating effort of engaging with others in mindful

activity. The "surroundings" even include the interpretations of prior experiences. This not only brings the individual closer to utopian ends but rewards the participant within the very activity.

As a philosophy, pragmatism insists upon engagement with the world. Experience becomes a defining feature and to not translate impulses into action represents a rejection of pragmatic philosophy. As a consequence, someone who with a perplexity which suggests that he or she should do something veers from possibilities and into necessity. The desire to act, the ability to clarify the vexation, the process of articulating a venture sets the pragmatically-informed professional on a course that encourages action. When impulse leads one to describe what should be undertaken, the very process of describing the undertaking boosts "ought to" into "must do" – this transforms the possibility of action from an appeal to the heart to a command from and to the mind. Experience, especially if it holds potential for creating surprise, becomes a duty. Individuals who recognize the compulsion to act and do so with the understanding that each experience will shape and expand what is know. Such a person recognizes the cascading effects as each experience shapes how to approach future experiences and moves forward knowing that the process as much as the products will be the reward despite the uncertainties associated with being unsure where ventures will lead.

We can borrow the notion of a trajectory (Dreier, 2003; Wortham, 2004) to represent a scholar activist as he or she acts, learns and grows. However, the path of a projectile seems an inappropriate metaphor within such a humanistic occupation. The guidance system for a science educator should be responsive and not pre-programmed. Through experiences, we have the opportunity to perpetually reshape our work and, by extension, who we are becoming. Within this "ideas in action" approach, who we are as professionals is a work in progress. Further, despite the need for movement from one experience to the next, the direction is into uncharted territories. Essentially, we recognize as science education scholar activists that we must keep moving even without knowing where it will lead – and that movement is necessary because that is the signature of pragmatism. Ortega y Gasset (1966) wrote: "To live is to be continually deciding what we are going to be. Do you see the fabulous paradox that this holds? A being that consists not so much in what it is as in what it is going to be and, therefore, in that which is not yet," (p. 43). This paradox represents the driving force for the pragmatic scholar activist.

Epilogue

Early in this essay, it was alleged that traditional institutions of higher education show little regard for nondominant groups or those in lower social classes; this same accusation could be made about Dewey. But recently, new texts have used Dewey's pragmatism as a specific starting point for a considerations of social justice and a more civil society. For those so inclined to pursue these commentaries, Eddie Glaude (2007) has collected several essays into his book *In a Shade of Blue: Pragmatism and the Politics of Black America*. Another activist oriented and pragmatism informed text is *Dewey's Dream: Universities and Democracies in an Age of Education Reform* (Benson, Harkavy & Puckett, 2007). If one was thinking of a study groups about contemporary pragmatism and the scholar activists, both books should appear on the reading list.

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III. ORCHESTRATING IMPACT IN SCIENCE EDUCATION

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Nature herself has a sense of organization. From the most basic lumping of matter together via gravity, a spiral galaxy organizes itself, planets can aggregate out of a swirling nebula of matter, and cascades of water scrape away canyons out of the layers of such a planet. As science educators, we get to indulge ourselves in these natural phenomena, and then relate them to ours students' senses.

In this context, the crucial point is that a system can be ruled by very simple principles (e.g., gravitation), but arrangements can emerge that are fascinatingly and surprisingly complex and beautiful. By its own design, there is no need to tinker, reform, or even be conscious of what takes place behind the scenes.

In biological systems, in spite of having living organisms with local control and sense, much of the same applies. Birds, with each individual operating independently of the other, can form flocks with sophisticated patterns of group behavior. Schools of fish complete similar organization as they group together. Ants and bees organize in lines and swarms, respectively, to accomplish great tasks of group survival.

Social systems are no doubt even more multivariate, but as scientists we should suspect that there are cause-and-effect relationships buried deep within. We see these at many levels, and perhaps the most familiar are those that we study: a classroom, a discourse between students in a lab, the relationship between a mentor and a learner. In these, we realize that there is much more taking place than a set of rules and a line of dominoes. Rather, individuals and groups within the social settings are able to make choices that are not bound by rules. It is fortunate that the universe does not assemble spiral galaxies in this manner (we'd never agree on how to accomplish the task) and even more fortunate that our personal and societal decisions have the component of free will, rather than a singular deterministic principle.

In reconsidering the case of the ants, we might find a lesson. Arguably, a colony is an example of a social system that *is* characterized by a simple set of rules. The marching ants accomplish their work by having each follow the line of the one preceding it. If an individual ant has free will, it does not manifest itself in the organization of the ants' social structure. Likely, any display of such free will would end to the demise of an individual ant in one way or another.

We do not want to be like ants, in spite of what they can accomplish. Ants certainly do a good job of surviving, but they are not burdened with the need to reform their education system, protest war, or rethink a healthcare system. (We might wonder if the ants realize how lucky they are not to have the need to consider such complicated tasks.) This symposium would be oversimplifying things to say that large organizations are completely analogous to ant colonies. However, we might be wise to consider the possibility that we, once in the setting of such a large scale social organization, might not be able to see past the ant in front of us. The image of the rower that Settlage presents to us in this symposium is, really, but a single ant. If we zoomed out and displayed the entire crew of the craft, we would witness something that was taking place in

unison and towards a common goal. This is rehearsed, planned, much like any organization ought to be. So, for me, the question is: How does a group of individuals direct themselves towards a common goal, but while maintaining a non-projectile-like, free willed, pragmatic thinking individuals? How we get things done passionately, deliberately, creatively, and freely, but within the context of a group?

Orchestrations of the Cultural Group

As any undergraduate text in ethnography (e.g., Spradley, 1980) explains, seeing the culture of your own group is particularly difficult, since seeing differences between what exists and what one already knows does not offer any contrast. Here, within our own cultural group, we might not recognize our own practices and limitations for what they are. In essence, we may be following the ant in front of us, creating a well-coordinated and self-supporting society, but without reflection on our practice.

The two preceding themes of this symposium, scholar activism and pragmatism, are both revolutionary in how they provoke us to think about our work. To be scholarly active and pragmatic in our approaches, we must reconsider our individual situations and reform these. No doubt, such a shift is both conceptually and practically difficult. However, it isn't impossible, and certainly we could each look to an individual who has, as a colleague of ours has described it, "danced disco while at the opera" (Magnia George, 2008, personal communication). Each individual can strive to do her own dance and work on her own steps, but coordinating a large scale effort across the cultural group calls for something more.

To change how we as an organization or as a discipline do our work, we must do something much more revolutionary. We have to change the culture from within. As pointed out, this requires first recognizing the culture in which we operate. In this case, we can identify attributes of NARST and related groups, such as how we organize into strands, what these strands are, how we disseminate our work, what work is valued, what we do in a conference session, what we do during coffee breaks, where we meet, what time we start and end a conference, how we elect our governance, how we spend our money, and on and on.

Let us suppose that we want to enact, on a large, cooperative scale, together, the pursuit of scholar activism and pragmatic adventurism. How do we bring this to the group; or, how do we collaborate on such efforts so that at the very least we each have a dance partner, if not an entire dance floor of individuals learning the new steps? How do we, together, support the individual ventures and the collective missions of the group? We don't currently have a model in front of us, either from experience nor from other resources, for this level of *orchestration*.

I suppose that there's more to it than simply wanting to create change, but then there is also more to it than simply having the ability to stage it. Both, and something else, too, must exist. Debra Meyerson, author of *Tempered radicals: How people use difference to inspire change at work*, suggests that there may be one of several conditions for organizing collective action:

1. the presence of immediate political opportunities or threats
2. available structures for members top organize themselves into a collective
3. the framing of collective identity, opportunities, and threats (Meyerson, 2001, p. 124)

Further, this organization can take place in one of a few different ways. It could be that a group organizes explicitly to respond to a shared threat or opportunity (p. 125), an individual's action encourages the participation of others (p. 126), or that some preexistent organization of a group allows for a collective action initiative (p. 129).

In reading these descriptions, one can probably imagine or recall various ways that these conditions have manifested themselves in various milieu. *Science Education at the Crossroads*, as mentioned in the symposium's introduction, was created in response to dissatisfactions of several individuals with current opportunities, frustration with political forces, and the ease with which a website and conference spot could create a collective identity. (I suspect that most conferences and organizations, including NARST, have similar roots.) Yet, since this initial creation, the group responds more to an internal regulation by the collection of individuals. Seeing conference papers in the proceedings and keynote presentations is evidence for this internal drive[3].

However, neither Meyerson nor any other organization I can imagine give a clear sense as to how to unify and coordinate a group effort. It is one thing to respond to outside "opportunities or threats," and it is clearly possible to gather individuals together into a collection, but it is much less obvious how to create a movement that intentionally creates something new and collaboratively works together towards this aim. Should we look to the natural organization of ants? I suspect we should break our tendencies to simply follow the leads of others. On the other hand, we cannot each exercise so much free will that we never work cooperatively with our peers. What model might we propose that is situated in between that of the ants and that of academic anarchy?

The image that Settlage presents in the previous piece is of a rower, who must, in order for the craft to follow along its necessary vector, be rowing in coordination and unison with the rest of the crew. While I can imagine such a rower following his heart, developing his own need for experience and an active, deliberate pursuit of his very being, I wonder about the overall direction of that boat. Without the help and active participation, totally coordinated with his fellow rowers, the craft is doomed. I wonder how we, each as individuals and each with our own "continually deciding what we are going to be," unite our efforts. At the same time, we must maintain our hearts and minds, not succumbing to the plight of the ants.

Without clear models in our own professional world for how to row the boat, I suggest we consider a new set of metaphors for how we could possibly work together. As the term "orchestration" itself suggests, metaphors from music, both its performance and its composition, may give us a method by which to better understand what *might* be possible.

Failed Orchestrations

Collaboration is something that I am able to accomplish sometimes, but fail to really understand. Asking a pair of co-scholars and co-spouses how they write together, collaboratively, elicited the response that they each, individually, worked in a separate corner, reemerging when some piece had been completed, and added that to the collective work. To me, this is in many respects

[3] See http://www.sciedxroads.org/reference.html

disappointing, as it is hard to imagine a more collaborative pairing that being both spouses and coauthors.

Musicians perhaps work much more cohesively than most scholar-teams or many spousal partnerships, at least in the studio or on stage. Music is not always a collaboration, though. It is also helpful to consider what musical arrangements fail to collaborate and how these examples map to our own experiences in our own discipline.

Take for example the model of the air guitarist. This is the practice of *imitating* the play of a guitar while "real" music plays behind you. Although there are actual competitions and celebrations of skilled air guitarists, there is no actual musical creation. No doubt, if you have experiences at all similar to my own, you have come across academic versions of air guitarists in graduate coursework, committee meetings, or even conference presentations. Similarly, karaoke, the pastime of singing the lyrics to well known songs in public as a recorded accompaniment plays in the background, is another model we could look to. It uses something that's already been created (the song itself and its recording) to provide us with a basis for our actions. It seems analogous to an administrator using your research to support one of his initiatives at your campus. Or, perhaps the metaphor lies in a line of research that is unoriginal, simply repeating old work and creating no new initiative. Air guitar and karaoke lack the creativity and passion that would be essential to the pragmatist scholar activist.

While air guitar and karaoke are obviously models that we don't want to base our professional and personal identities on, they give us a way to represent features of certain work that we find unappealing. I find this useful, personally, for describing what I find dissatisfying about my surroundings from time to time. However, before we start getting too entertained with such analogies, let's continue to try on some other metaphors that may demonstrate aspects of our work that *do* have appeal.

Anthems

The typical conference keynote, generally given by an association's president or other officer, is generally a call to action. It could be reminiscent of the tune played behind a march, or some kind of an anthem – a "rock anthem" by *Queen* comes to mind for me. As I listen to these keynotes, I suspect that there's a secret desire on the part of the speechmaker that we should all start cheering out in support ("*We will, we will rock you!"*) and begin enacting new initiatives right there in the ballroom, tossing our unfinished plates of baked chicken fillets or vegetarian pasta and making reform a reality in science education.

Yet this never happens. Yet, I don't think it's because it isn't possible. After all, we can imagine examples, both farcical and serious, in which a large group of individuals does something extraordinary. The difference between these isolated events and the general call to action and reform is that we know how to give instructions to do very specific tasks (e.g., doing "the wave," balancing peacock feathers, finding someone with the same birthday as yourself in a crowded room); but, I have yet to hear someone follow their call for educational reform with a set of instructions. I suspect very strongly that we don't have any idea what we're doing, and we have no set of instructions to follow. Whereas the aforementioned rower and the ant are completing a task for which the steps are understood, our grander goals have no such checklist.

Solo Guitar

I think we best understand how to work as solo acts. Furthermore, I'm confident that this is currently where most of the real work, both in research and in social action, gets done. I'm surrounded by solo efforts that are effective and inspiring. It's as if the actual musician that the air guitarist was impersonating steps out of the stereo or iPod and begins playing for us live.

My model for this is Eric Clapton, both because his guitar playing earned him the title of "God". It's interesting that behind Clapton there is always the bass guitar and the percussion, as well as the multiple and diverse preparations backing up the entire effort. Solos are dependent not only on individual skill and creativity, but on an entire support structure as well. It is this way with much of what we do as soloists in our own work. It could be that this is exactly what our efforts envisioned by Settlage should look like. And, perhaps this would work. That's really up to all of us. If all of our individual, pragmatically scholar activist pursuits sum up to a greater good, then perhaps is exactly the model we should try to continue to build. I could close this essay with this metaphor.

But I am unsatisfied with the model of a solo act in that it requires a group of individuals to play backup. The pragmatic philosophy and the active engagement described in the previous essays do not apply to the drummer, the bass player, not even the horn section. If we are all free and encouraged to be so active and creative, then we should look to a more equitable model in general.

Apprenticeship

We are always working with others in ways that aren't simply the expectations that they'll be our drummer or bass player. Often we find ourselves comfortably sitting in mentoring roles to preservice teachers, graduate students, and even one another. Unlike many collaborations, this is something that many of us are at least implicitly trained in. We've had some kind of mentoring from some other individual, and we often have this role passed down to us. For me, my first real taste of research was in working with my undergraduate mentor, Michael Broide, in the physics department at Lewis & Clark College. Later, Julie Gess-Newsome and Sherry Southerland introduced me to a project when we were all at the University of Utah. Here's some data, they said. Here's how we're thinking about it, they said. Do something with it, they told me. This is how I became a researcher. I'm still working on my identity as a scholar, but the process of initially becoming a part of the field and getting a sense of what it was all about was the result of others taking me under their wings and then finally letting me go. I specifically remember Sherry giving me an article to review and justifying this by telling me at the time that "you know as much about this as anyone else in the field." These were empowering wings to be given as a graduate student, and it was an apprenticeship experience that led me to that point. While Sherry was at the time trying to compliment me, it was really a credit to what she had done to allow me to work to that level.

Musicians undoubtedly do this all the time. One of my favorite musicians, Bruce Hornsby, spent many years playing along with the Grateful Dead. Now, even though that touring combination is no longer active, his live shows still incorporate the songs and styling of Jerry Garcia and the Dead, and "deadheads" are common followers of his shows. At a completely different level, my children each enrolled in music classes from when they were toddlers up through preschool in

which they would sit in circles and imitate the sounds, movements, and instrument playing of one another, parents, and a teacher. There was no real instruction – it was all mentoring. My experience as a graduate student and my daughters' experiences in "Music Together" were not all that much different. (I'd argue that my dissertation was better, but I'm sure this is debatable.)

So, mentoring is something that we may already be good at. In fact, it seems to be something that we do naturally not only with our students but with one another. So, perhaps a way of coordinating and supporting one another's efforts could simply be in the form of a meeting place for the purpose of mentoring. On the other hand, mentoring is something that cannot happen spontaneously, just because individuals congregate. And, I especially would not want to support a system where the mentoring was only occurring in one direction, and only for the sake of allowing those with newly found wings to go out and establish new solo efforts. This model eventually has the same shortcomings.

Fugue

It occurred to me recently that I don't have any fugues getting stuck in my head, ever. This could be for several reasons, including the fact that I need to listen to more fugues and perhaps more classical music in general. However, from time to time I will get a piano sonata or a prelude to ring in my psyche, but no fugues. The reason, I think, is that a fugue is supposed to be a composition in which multiple "voices" emanate from a common instrument (or ensemble of instruments), calling upon and responding to one another. In effect, there is no real singular melody, so there's nothing to key in on and hum along with. What's interesting, though, is that the combination of voices, even as they call upon one another and even overlap, is completely coherent. While Bach is particularly well known for inventing fugues in baroque stylings, the fugue that is particularly intriguing for me is in Chopin's *Fugue in A-minor*. (Apparently this is a relatively rare piece, and the only fugue that I know of that Chopin created.) It is played on the piano with two voices, one coming from each hand of the pianist. In a matter of just a few minutes, you can hear and imagine a conversation in which the dialogue goes back and forth, overlaps, contemplates something, rises to a conflict, and then resolves to some conclusion in which both voices arrive at a common note, but from different independent melodies.

I think it's significant that a fugue is difficult to hum or even remember. The combination of voices is a bit foreign to us, and our bias for solos rising above the rest of the musical structure makes it difficult to disentangle the puzzle of a fugue. Similarly, we are unfamiliar with other collaborations in which the voices are both equally heard, simultaneous, coherent, and still responsive to one another. I wish I had more examples of this in my professional life.

Yet, I have witnessed writing process that were at their heart, very fugue-like. In such rare but memorable collaborations, a single voice tries itself out in a written proposal, to which a reviewer or co-author responds, and then subsequently an additional reviewer or co-author responds again. This process continues, and often the voices repeat one another and respond directly to suggestions, but almost as often a voice creates a new theme that wasn't mentioned explicitly by the other. This creation by the individual, as a result of working with another individual, directing and building as a cohort, is a model more in tune with what I was aiming for in this essay.

Throughout these fugue processes, each voice is heard and responded to. While there is no melody, there is resolution and collaboration. I wonder if the model of the fugue could model other ways, in addition to writing, in which we interact. I wonder if we are too often afraid to loose our own melody – perhaps our own voice – when others chime in. Or, perhaps there are not safe structures in place to support this back-and-forth, give-and-take interaction in most settings.

Jazz Improvisation

Settlage, in the previous essay, brings jazz to the table for our consideration. The incomparable Miles Davis was particularly known for collaborative efforts. This is one example of how Davis' sessions for the album *Kind of Blue* were described by fellow musician Bill Evans:

> Miles conceived these settings only hours before the recording dates and arrived with sketches which indicated to the group what was to be played. Therefore, you will hear something close to pure spontaneity in these performances. The group had never played these pieces prior to these recordings . . . (Evans, 1959)

It's true that this kind of setup is something that we can re-create for scholar activists, putting them together in a common place, giving them enough structure or sketches, but also enough space for each voice to contribute. This isn't easy, though. It requires more than just imagining it all. Evans says it this way:

> Group improvisation is a further challenge. Aside from the weighty technical problem of collective coherent thinking, there is the very human, even social need for sympathy from all members to bend for the common result (Evans, 1959).

The dilemma is in the contrast between the individual and her creativity and the group and its collective rigidity. Somehow, creations like *Kind of Blue* call upon the "social need for sympathy from all members to bend" towards something that is common to all of them. How does this happen? Certainly, Davis' ensemble was small in number but large in talent – perhaps genius, considering that John Coltrane was playing along in addition to Davis and Evans. While I haven't yet heard anyone from the science education community contingent wailing on a sax, there surely exists some real genius, talent, and pure creativity in the mix. And, like Davis' group, we can carve out small collections of these individuals, as is done all the time in individual conference sessions, college departments, grant collaborations, etc.

But, I think there's something else that needs to be in play. There must be some inspiration that each of us gets from the group and gives back in turn. Take, for example, the interaction of Thelonious Monk and John Coltrane. A couple of years before Coltrane played on *Kind of Blue* he was coming to understand and play along with Monk at a small club. Eventually Monk's quartet, along with Coltrane, played at a benefit at Carnegie Hall. (The recordings of this performance was serendipitously found in the holdings of the Library of Congress in 2004.) This collaboration was described as follows:

> Everything they play is exciting, dynamic, sometimes adventurous, and very much in sync. Monk is having such a good time at the piano that he hardly gets up from the bench. The stories . . . always portray Monk as dancing around or heading toward the bar while Coltrane blows with the rhythm section. But what Monk is playing underneath Coltrane is pure brilliance; to call it "comping" [typical blocking of chords in jazz piano accompaniment] simply does not do

> justice to the creative dialogue Thelonious is having with the entire band (Kelley, 2005).

"Exciting," "dynamic," "adventurous," and "in sync" are perhaps those additional elements that create this kind of creative output. (This is brought up by Settlage as well, in his description of jazz.) For me, these elements exist in some of my favorite interactions with colleagues, and they may be what produce the "creative dialogue" that makes me feel like I am really producing something unique to the group, the time, and the space. The small group of creative individuals may be necessary, but not sufficient. Monk was having fun, and that may have made all the difference. In this case it kept him at his piano bench rather than at the bar. How lucky would we be if the same could be said of all NARST conference attendees?

This metaphor may give us a model that we can continue to pursue – we would just need to create appropriate venues and atmospheres (as Miles Davis did) in order to sustain the creative collaboration. But let me push things just a little more. If we simply sustain such interactions, we may be selling ourselves short. In addition, such collaborations that are exciting, dynamic, adventurous, in sync, and fun are all in effect only when the band members are in the rehearsal and recording sessions. There may not be a way, with this model alone, to ensure that orchestrated efforts occur beyond a specific and limited time and space. When we speak of reform and creating impact (such as the impact on public policy suggested in this year's conference theme), these efforts should extend beyond a specific interaction. They should be planned for and projected towards grander goals.

A Night at the Ballet

I love ballet and I'm not ashamed to admit this. I couldn't have told you this a few years ago – I'd never been before. But I'm fortunate enough to have a partner who insisted that going to Tchaikosvky's *Nutcracker* is an annual tradition that we needed to start. She was right. (She always is.) Let me try to explain, but keep in mind that describing the experiencing of *The Nutcracker* is nearly impossible – even more so than trying to describe a jazz performance.

The Nutcracker, as it is a ballet, has elements of dance at its core. The dancers, of course, all play roles that fit together into the telling of a story. Layered behind this is a stage with giant elements of artisanship that also tell part of the story. And layered in front and ethereally around everything is the music of the orchestra. So, hold onto all of this and then imagine that one of the dancers is a giant mouse, and one of them is a reincarnate nutcracker, and that these two are having a sword fight. While dancing. To music. In front of the scenery in which a mediocre Christmas tree has grown into a gigantic auditorium-appropriate tree and the rest of the stage is alive with mice, soldiers, and a little girl. And the music continues to envelope the entire scene and the dancing continues and the story is, believe it or not, coherent and beautiful.

This doesn't simply happen on its own. For as talented as the geniuses of Monk and Coltrane and Davis were, they could not (or at least *did* not) get together to create something as multidimensional as this. It simply can't be done if you only rely on the flow of creative juices and a bottle to catch them. Something else has to be planned. Frankly, I don't understand at all how this works, but surely it does. So I'd like to try to imagine how the kind of orchestration that is had in a ballet between the choreography and the visual appeal and the music can be used in our field. How do we create something that is so well implemented and coordinates so many

levels? This, to me, is something that can endure *and* something that can reach out at a grander scale.

While I don't understand how to do this, I do know that we have before us the dancers, the artists, and the orchestra. Take a look at any set of conference proceedings – perhaps even consider the program for this very NARST conference. Here we have teachers (albeit far too few), policy makers (surely not enough), and researchers, all together. And here they produce questions about research pursuits, teaching improvements and reform, research methodologies, and the like.

So, while I don't know how to choreograph a ballet, I do recognize that we, as a community, have before us some of the right players. We surely should be including more of our practitioners, and I would surely love to understand more about policy making itself from experts in this field (if I could only find their strand at NARST), and to be able to collaborate with political leaders . . . well, perhaps this is asking too much. But it may be that this orchestration is what we need, and it may be that the grandness of what this requires is modeled for us in the ballet.

My challenge to myself and the community, then, is to find a way to orchestrate our efforts – the solos, the fugues, the improvisations – into something that is greater than even the sum of our individual efforts. Is this possible? We cannot expect to find out unless we try, repeatedly, with multiple non-starts, failures, and other learning experiences. I believe that our current model runs very smoothly not because of all of us, but in spite of all of us. We follow, via instinct or cultural norms or simple habit, the ant in front of us. To continue to do so will make us very efficient at continually recreating exactly what we already have.

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IV. POSSIBILITY, SURPRISE, AND IMAGINATION: THE PROMISE OF SCHOLAR ACTIVISM, PRAGMATISM, AND ORCHESTRATION IN SCIENCE EDUCATION

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Our job as science education scholars has been, historically, to point the gaze outward. Many of the NARST community come from science teaching backgrounds, but soon after we leave our classrooms to pursue our doctoral work, we learn to see the world and problems in science education in new ways. We become enculturated into the academic's ways of knowing, which involve several shifts of worldview (Labaree, 2003). Those who make that worldview transition successfully are able to analyze problems in science education that will inform other science education researchers' work. I think, probably, Moss, Settlage, Johnston, and I represent scholars who have made the transition successfully. In doing so, we learned to point the gaze outward; the "problems" with science education were "out there"—in schools, with overly narrowly curricula, with lack of adequate preparation of teachers, with the difficulty of getting students to understand science concepts meaningfully, with oppressing policy, and on and on.

What Moss, Settlage, and Johnston ask us to do in the previous essays is less comfortable, disconcerting even. They ask us to look inwardly at our own profession, our roles, our activities, our sociohistorical ways of defining who we are and what we do. They ask some serious questions—What does it mean to be a science education scholar? What does our work currently entail? What underlying assumptions and values guide our work and the ways we define "good" work? What counts as a worthwhile question in science education research? How does our work feed and sustain the status quo? As I see it, these questions force us to closely examine taken-for-granted meanings of "science education scholar" and the implications of such meanings for enacting significant change in science education settings. They compel us to make the implicit, explicit. And that is an absolutely essential aspect of engendering change.

I first heard these ideas presented as keynote addresses at the last three years of the *Science Education at the Crossroads* conferences (Moss, 2005; Settlage, 2006; Johnston, 2007). I can attest to the inspiration invoked by each of these keynote addresses; these scholars' ideas prompted excitement, new energy and ideas, and new possibilities for how we might do our work, conceptualize our roles, and define ourselves. Since then, I have given lots of thought to what it is about these ideas that are so simultaneously disconcerting and inspiring and whether or not their calls for change are doable for our field. In this brief response essay, I describe what I see as themes running across all three papers and provide an argument for why these are ideas worth taking seriously.

Common Commitments

Though Moss, Settlage, and Johnston propose multiple ways for pursuing it, "change" is an obvious theme that runs through all three papers. Current ways of doing science education scholarship are unacceptable, for myriad reasons. The work that sustains the reproduction of our

discipline (science education) is simply not effecting change in the ways we have hoped. Johnston put it eloquently in the last line of his essay:

> We follow, via instinct or cultural norms or simple habit, the ant in front of us. To continue to do so will make us very efficient at continually recreating exactly what we already have. (Johnston, 2008, p. 28)

As Moss explained, our system celebrates professors who "perform and conform" (p. 6). There is not a lot of space, recognition, or reward for becoming a new kind of science education scholar in the current system, with all its historical referents and power, and with everyday practices (instincts, habits) that reproduce, again and again, the same meanings of "good" science education professors. Yet, that re-definition is exactly what is needed, according to the authors. And, that's the disconcerting part. We do not want to be told that, though we went into this profession wanting to change the world, in fact, what we do daily may not be all that impactful or, at least, not as impactful as it could be. Each author destabilizes our comfortable positions, compelling us to believe, to *know*, that it is not acceptable to keep doing our jobs in ways that reproduce status quo in our profession. For example, Moss argues that, as we continually reproduce the same old notions of "scholarship" and "service" that get rewarded at many universities, we simultaneously ensure the historically stubborn divide between the academy and "real world" problems.

Thankfully, the authors do not leave us without hope for change; that's the inspiring part. They do not simply advocate for a deconstruction without offering possibilities for what might be, for how we might go about this daunting task of re-definition and reconstruction. Each paper proposes some form of *action*, simultaneously placing responsibilities on science education scholars to do something about this problem, but also providing a model for what this action might look like (Moss's scholar activist), how we might make decisions about what action to take (Settlage's pragmatism), and how we might coordinate this action (Johnston). Their ideas are possibilities for what might be.

Is this kind of change possible, or is this just crazy talk?

In my response here, I draw on ideas from anthropology of education to argue for the promise and merit of a new kind of science education scholarship/professoriate proposed by Moss, Settlage, and Johnston. Their ideas about how to transform the profession are indeed very sound, and I re-examine key elements of their arguments through an anthropological lens to demonstrate why I think this is so.

Though these authors are defining new visions for what might be, the truth of the matter is that broad-stroked visions (*anthems*, to borrow Johnston's word) are often relatively ineffective in bringing about meaningful, sustainable change. I think, probably, the authors would agree with me on this point. For example, Settlage proposes that matters of the heart guide our actions, which propel thoughtful reflection for subsequent action. Clearly Settlage's model here for change does not imply that we rally around an all-encompassing, overarching vision for science education scholarship.

Science education scholars' work is historically steeped in psychological perspectives, but I argue an anthropological lens can help us understand the possibility of change that may emerge from new science education research activities. Take, for example, the concept of cultural

production, defined by educational anthropologists as "meanings developed by groups in their everyday activities" (Eisenhart & Finkel, 1998, p. 44) that reflect or counter meanings implied by larger social structures. Cultural productions allow us to understand why and how sociohistorical legacies are reproduced in local practice. For instance, in examining the cultural meaning of "presenting a NARST conference paper", we might find that many NARST participants value the experience for the additional line on their curriculum vitae (CV) versus for the opportunity to critically engage a community of scholars with one's ideas. Why does this less than hopeful meaning get reproduced for many NARST scholars, again and again each year? A cultural production lens points us to examine the everyday activities of conference presenting and their implied meanings. For example, here are but a few examples of how the rather alienating, but historically enduring, meanings of "presenter" and "audience member" at NARST (and other) conferences get reproduced through taken-for-granted practices:

- Requirements of presenting final-form, "completed" research implies a meaning of presenter as disseminator and audience members as recipients of the research whose roles, *at best*, might be to critique or laude the existing research.
- The physical layout of the conferring space also promotes a meaning of presenter as authority and audience member as recipient/digester of research.
- Timeslots for presentation that are impossibly short, especially for presentations packed with too many ideas for meaningful digestion and critical reflection by audience members. These are practices that, again, reproduce meanings of presenter as authority and audience members as mere recipients.

While the concept of cultural production helps us understand why and how alienating or oppressive meanings get reproduced again and again through local practice, it also helps explain how groups, in their everyday practice, might work to contest historically enduring legacies to create novel meanings (Carlone & Johnson, 2007; Eisenhart, 2001). Indeed, this is what the conference *Science Education at the Crossroads* achieves for many of its participants. By engaging in new kinds of "conference" activities (presenting ideas that are not yet fully developed, meeting in small "incubator sessions" around a table, providing more time for conference presenters to talk and to listen to session attendees, etc.), the meaning of "presenting at a conference" gets transformed from another line on the CV to the opportunity to critically engage a group of science education researchers, teachers, and scientists with one's ideas (Settlage & Johnston, 2007).

My examples here are not to tout the *Crossroads* conference as the answer to our problems with the science education professoriate. I simply use this example to demonstrate that, when examining problems with the science education professoriate (looking within), the concept of cultural production helps us understand the ways everyday practices enable and constrain possibilities for transformative meanings to emerge. It is important to note here, however, that it is not possible to promote *any* new meaning of science education scholarship. There is, as Wenger (1998) points out, an economy of meanings. There are only so many different meanings that can legitimately emerge from a group's activities because our activities are interactionally defined and are shaped by history and politics. We draw from similar resources as we engage in meaning-making activities.

And yet, as Settlage reminds us, there is room for serendipitous surprise—novel meanings—to emerge when engaging in new kinds of activities. The concept of cultural production allows us to appreciate and relish the possibility of surprise. This is why it is imperative that we do not too tightly define new roles; the new roles should be purposeful enough to provide direction (per Settlage's pragmatism), but not so rigidly defined so as to cut off the possibility of novel, innovative meanings. Obviously, our current ways of doing science education research have not done nearly enough for students and for society—what are other ways of doing our scholarship, of being science education professors, that would do more? The answer is not yet clear (as pointed out in this symposium's introduction), but the point here is that, perhaps, what it means to "do more" is not yet clear either. In engaging in new activities, we are not yet certain what meanings might emerge. Cultural production reminds us that the outcome of a situation, or the meaning produced in a setting, is never determined or fixed; it is always in question (Eisenhart, 2001). In parallel, Settlage explains persuasively how we must be purposeful about this perpetual meaning-making, which, in turn, allows us to continually re-make ourselves as scholars:

> The guidance system for a science educator should be responsive and not pre-programmed. Through experiences, we have the opportunity to perpetually reshape our work and, by extension, who we are becoming. Within this "ideas in action" approach, who we are as professionals is a work in progress. (Settlage, 2008, p. 17)

How should we balance this element of "surprise" with the need for our work to stay recognizable as "good" scholarship within the field? This is not an easy tension to resolve, but I think Moss's suggestions actually offer outstanding possibility for doing just that. He asks us to engage in new kinds of scholarship and service activities, but his suggestions do not imply a radical teardown and reconstruction of our existing resources (skills, knowledge base, understandings, experiences). He argues for science education researchers

> to both generate scholarly products which are *indisputably the coin of the realm in academia* while concurrently promoting change within and beyond the ivory tower by *making our work accessible in non-traditional venues* and better yet, directly engaging as change agents. (Moss, 2008, p. 8, my emphasis).

In calling for science education professors' "life of the mind" to "be a catalyst for a life engaged" (p. 8), Moss balances a call for reform with a nod to the ways our tradition's histories inevitably shape that very reform. Further, Moss's plea for us to act locally aligns well with the possibilities for cultural productions (new meanings of our work). Settlage's arguments include a similar deference to history and embrace of change when he quotes Dewey: "[E]very experience both takes up something from those which have gone before and modifies in some way the quality of those which come after" (1938, p. 35, quoted in Settlage, 2008, p. 15).

I do agree with Johnston, however, who cites the overly individualistic nature of the models proposed by Moss and Settlage. Promoting change, from a cultural lens, involves *group*-level participation in coordinated activities that give rise to meanings that make sense to that group. It is nearly impossible, for example, to enact an identity of "scholar activist" by oneself. Even Cornel West had difficulty doing it (as mentioned by Moss, 2008). This is especially true of more vulnerable scholars (new scholars or scholars from historically marginalized groups). That identity would likely go unrecognized by colleagues at one's institution and in the broader field and would be unsustainable for the aspiring scholar activist (see Carlone & Johnson, 2007 for an

argument about the importance of recognition in the work of identity production). Thus, it is important to embark on these transformations of our roles in groups.

So, this isn't crazy talk… it's imaginative

My plea for understanding the merit of these ideas from an anthropological lens is not to say that individual contributions, thinking, and ideas have no place. Indeed, a final key element involved in embracing the possibilities of change represented in the work of Moss, Settlage, and Johnston is to recognize the *imagination* embodied in their essays. Their ideas, individually and collectively, should hit hard. They should make us uncomfortable, get our hearts beating a little more rapidly, and inspire sustained dialogue and action. As well, for me, their ideas speak to matters of the heart that so often go unacknowledged and are even silenced. Their visions for what might be are provocative, uncomfortable, inspiring, and scary. They push us forward, into relatively uncharted territory, providing imaginative visions of how we might do our work differently, of who we might be – if we dared.

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