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A SYSTEMS PERSPECTIVE OF DEMOCRACY AND EDUCATION: A TRANSFORMATIONAL IMPERATIVE

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Systems Theory for Pragmatic Schooling: Toward Principles of Democratic Education
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Cunningham (2014) frames his argument in seven chapters, beginning with a perspective of the schools and schooling we have today and ending with his view of "the schooling we need." He presents a complex argument that describes how educational change may occur, building upon the ideological perspectives of Dewey's epistemology and complexity theories. The connections he makes among Deweyian epistemology, complexity theories, and democracy are important but may not go far enough in critiquing 21st century democracies. The important insights and connections Cunningham makes among systems theories, learning theory and change need to be extended to understand and tap the potential of complex adaptive systems to be transformed and to reveal further how educational transformation can impact social systems like democracy.

Seeding the Argument

Cunningham begins with a description of how he sees schools today. With an underlying metaphor of schools as factories, he presents an argument for why we need to rethink schooling. While his discussion of the "manufactured crisis" of American public education does not reference key discussions by Ravitch (2010), and Berliner and Biddle (1995), he does usefully suggest that this "crisis discourse" (p.7) nourishes the educational reform movement in ways that exacerbate the outcomes of the neoliberal drive to feed the mechanisms of society. What is needed, he states, is a different perspective of the purpose of schooling. "We need to change the way we see things" (p. 7). Cunningham goes on to provide the basis for new ways of seeing things by advancing and supporting complexity and

interrelationship rather than simplicity and the individual child focus predominant in his representation of the factory-schools of modernism.

For an in-depth treatment of this post-modern perspective, the seminal work of William Doll in *A Post-Modern Perspective of the Curriculum* is highly recommended (Doll, 1993). While many of his readers are likely to agree with him, Cunningham does not provide a compelling case for those who believe schools are failing according to their own alternative perceptions of success, or those who feel schools just need to do what they've done in the past, but better and with greater accountability and scrutiny. While this introductory chapter is simply intended to set the stage, a compelling case for rethinking education must be made in order to convince those who don't already see the need.

Cunningham quickly moves on from the claim that we need to rethink education to a two-page history of curriculum, beginning with education historian Lawrence Cremin (1990) and including a perspective advanced by Abbott & McTaggart (2010) that the curriculum we have supports consumption. The corporatization of society and consumptive perspective of democracy was nicely articulated by historian Christopher Lasch when he defined the "culture of narcissism" in his book of the same title (Lasch, 1979) over thirty-five years ago. Picking up populist themes of economic justice, participatory democracy, and social interrelationship, his final book, *The Revolt of the Elites* (Lasch, 1995), published posthumously by his daughter, was critical of what he described as the 'cosmopolitanism' of society. Cunningham's argument would have benefitted from linking perceptions of democracy and implications for schooling in such a manner. As Cunningham argues, curriculum is driven by perspectives of schooling that are related to overall perspectives of our socio-political agendas and understandings of the relationship between schooling and democracy.

The next section of his introductory chapter goes on to distinguish schooling from education, training and socialization. Referencing Tozer, Senese & Violas (2013), Cunningham characterizes the relationship, as he sees it, among schooling, ideology and political economy.

> Picture an equilateral triangle, with schooling at one corner, ideology at another, and political economy at the third. Each of the sides of the triangle has arrows at both ends, indicating that the influence goes both directions. So ideology affects schooling, and schooling affects

> ideology. Political economy affects schooling, and schooling affects political economy. Finally, political economy affects ideology, and ideology affects political economy. (p. 10)

This representation, shown below, serves as the model for the ways in which Cunningham perceives that "schools and society are related" (p. 10), with the connecting lines serving as mutual, bi-directional influences across these three dimensions.

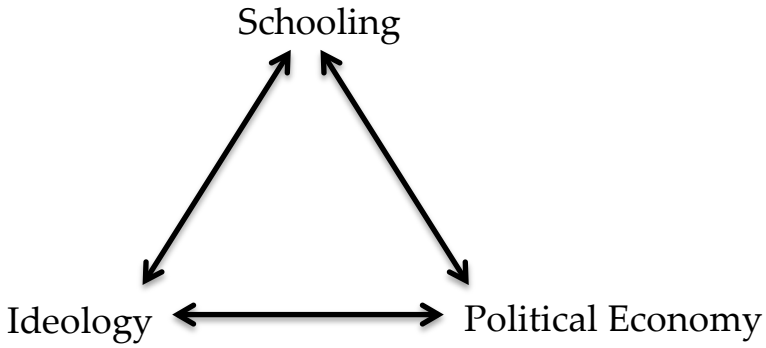

Figure 1: Framing the Argument

As his argument in the book hinges on these relationships, it might have been helpful had Cunningham organized this chapter around these themes more specifically. This framework would have also provided a perspective from which to engage those who might not agree with the major premise of his book, namely that we need to rethink education, and for explaining why he introduced the history of curriculum (because of its relation to schooling) earlier in the chapter. He uses this model at this point in his argument to introduce Dewey's pragmatic naturalism and systems theories[1] as the bases for the ideological perspectives on schooling he wishes to present. Keeping the model in mind helps to clarify the two ways in which Cunningham uses Dewey's ideas: first from the perspective of Dewey's pragmatic naturalism and epistemology as the basis for an ideological framework for a different kind of schools and, secondly, for Dewey's understanding and perspective of democracy, especially as it is related to education and schooling.

As Cunningham continues to lay out the framework of his argument, he states he will connect Dewey to systems theories through Dewey's notion of "situation" in his transactional theory of knowing. This leads us the second and third chapters where this argument is made.

Ideological Grounding in Pragmatism and Systems

Although Cunningham suggests he will connect Dewey and systems theories through Dewey's notion of "situation," his chapter on Dewey casts a wide net and includes discussions of Dewey's theories of nature, action, epistemology, metaphysics, aesthetics, and ethics. In other words, he tries to capture all of Dewey in twenty-five pages. The result is a compilation of quotes and references to Dewey scholars that is unfocused and diverges from the main point of his argument.

For example, as Cunningham begins to describe Dewey's naturalism, he states that Dewey's view is not *transcendent* and that Dewey's perspective is *natural* and grounded in experience. These statements refer to an entire philosophical argument going back to Plato, Aristotle, Heraclitus, and Democrates about the nature of knowing, which should be referenced, if he is going to raise questions of epistemology. Then, he gestures toward the pragmatic turn with a William James reference although, even then, James' psychology and epistemology should not be conflated. Just as Cunningham's statement that we need a different way of seeing schooling would not convince those who disagree with him, these superficial references will neither satisfy Dewey scholars, on the one hand, nor those who are unfamiliar with Dewey and the arguments he is addressing, on the other. For the latter, in particular, the discussion of Dewey is, in many places, filled with Dewey's specialized language, which, without context, makes it difficult to understand where Dewey (and Cunningham) is coming from.

The core of Cunningham's argument focuses on Dewey's notion of situation in his transactional theory of knowing. Cunningham connects situations, as networked relations among entities, with experiences and knowing. "All experiences take place within one or more situations. Situations are made up of networks of relations among entities. These interrelationships are as much a part of the situations—and of our experience of them—as are the entities involved" (p. 19). Cunningham unpacks these ideas by providing an example of an experience he had as a third grader in a spelling bee. As he describes the details of his memory of the experience of misspelling the word "cliff," the situation is describe as the "complex web" of his feelings, recollections, and later experiences and his interpretations of them. "The boundaries of a situation – what's included, and what's not – are determined by attention" (p. 20). He correctly connects this view of knowing and experience with a pragmatic perspective of reality. What we know and what we see as real are the interactions we experience.

The figure below captures Cunningham's description of the spelling bee event along his timeline of experiences and memories. Although memories, as he describes, might be conveyed by dotted rather than solid lines, memories and experiences still comprise the conscious part of a situation. In this way, all events, such as the Spelling Bee, his experience of the spelling bee, and his memory of his experience of the spelling bee, are systems, and vice versa. "All systems are events, and are made up of events, and occur within the context of situations consisting of still other events … [and] all events occur within one or more situations, or contexts" (p. 23).

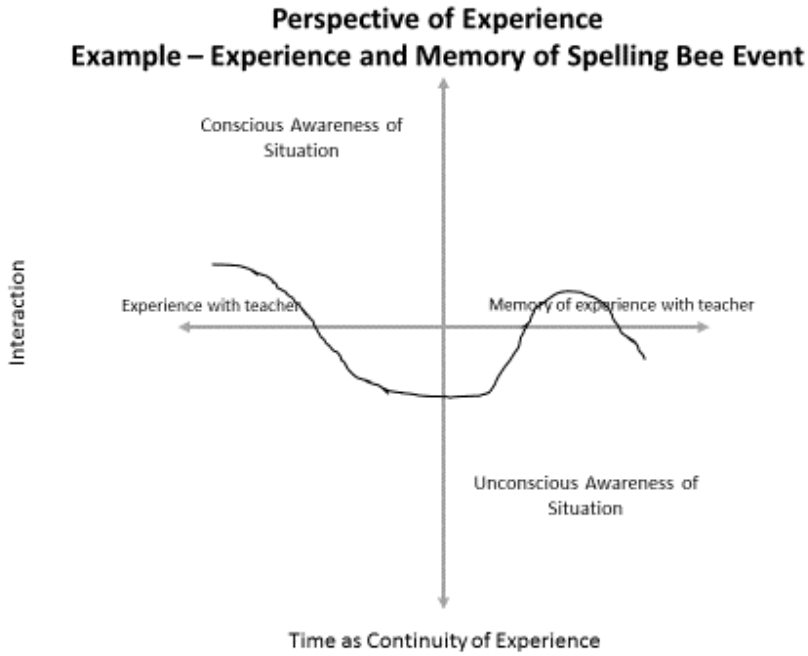

Figure 2: Cunningham's Interpretation of Dewey's Notion of an Event

This explanation of Dewey's notion of event and the relationship between experience and "reality" relies on an appreciation of pragmatic realism and the blurring of the lines between epistemology and ontology that occurs within the pragmatic realist worldview. Cunningham's summary gets to his point of the relationship between the continuity of experience and situations as complex interactions. "Nothing is completely simple as it comes to us in experience, because nothing exists without interactions or without a history. … Experiences as they come to us are both spatially and temporally complex" (p. 24).

Cunningham goes on to introduce and explore Dewey's theory of inquiry, which is especially relevant as we consider learning in a classroom setting from the perspective of connected experiences and systems of events as complex situations. He could have arguably focused more here on Dewey's perspective of inquiry as a

stance toward knowing that includes the cognitive and non-cognitive as intertwined dimensions of an on-going process. The inquiry cycle, as described in Dewey's 1938 book *Logic: The Theory of Inquiry,* incorporates non-cognitive aspects of knowing that are important in learning, including inspiration, intuition, and insight (Fleener, 2002b).

William Doll makes explicit the critical connections between Dewey's pragmatic epistemology, process ontology and learning as inquiry. Doll (1993) connects Dewey's theory of knowing with the pre-Socratic process philosopher Heraclitus to focus on recursive relationship through natural processes. Recursive, reflective dynamical processes are crucial for organic system change. Dewey's perspective of learning as on-going, dynamic process emphasizes reflection, interaction and transaction and entails what Doll (1993) describes as an experiential epistemology.

> Reflection is taking experience and looking at it critically, variously, publicly: that is, connecting our experiences with others' experiences, building a network of experiences wherein past, present and future are interrelated. … It is a reconstruction of actions taken; it is a re-look at meanings made. (Doll, 1993, p. 140)

Doll explicitly connects Dewey to systems theories through the perspective of learning. As described by Doll (1993), learning is a dynamic process that includes reflective understanding and recursive feedback and is important from the perspective of transformation, adaptation and change. This connection is not clear in Cunningham's use of Dewey's inquiry. *Transformation*, as it relates to learning, is described by Dewey as "the real problem of intellectual education" (Doll, 1993, p. 138 quoting Dewey, 1971/1933, p. 84). By connecting Dewey to systems through "situations," Cunningham gets bogged down in details of pragmatic epistemology and later has difficulties connecting systems perspectives with education.

This is not unusual. Reflection as the intermediary that binds the primacy of hands-on experience with the secondary experience of "continued and regulated reflective inquiry" (Dewey, 1958/1925, p. 4), or as the broad rubric under which process and product are entwined, is often not addressed by interpreters of Dewey, according to Doll.

Cunningham might also have simplified his argument by connecting transformative learning with Piagetian adaptation within the social context (Fleener & Rodgers,

1999). Bill Doll (1993, 2010) connected transformative learning and Piagetian adaptation through recursive reflection, already seen as core to Dewey's logic of inquiry (Dewey, 1966/1938), exploring how adaptive learning is associated with responses to perturbation that include both assimilation and accommodation. Adaptive response involves the ability to accommodate environmental stimuli through higher levels of reorganization. In the natural world, Prigogine was among the first to describe how dynamic systems use feedback to reorganize at higher levels of complexity and maintain system integrity. In nature, without adaptive reorganization, complex systems are doomed to fail or die of their own inertia. Again, I quote Doll (1993):

> "Thinking", says Dewey (1957/1948) "is a method of reconstructing experience" (Dewey, 1957/1948, p. 141); it is a method of reflecting on experience; it is a uniquely human activity and is our only reliable guide to further action. It is crucial such reflection be recursive: that once accomplished it acts as a guide to further practice, itself the occasion for future reflection. In this ongoing process, the past and present provide a basis for the future without limiting or tightly controlling the future. Here the future is unique, not a repetition of the past, but continuity exists. It is this sense of continuity which Dewey (1963/1938) prized highly, calling it one of the two criteria of the quality of an experience. (Doll, 1993, p. 141)

Cunningham instead connects Dewey's pragmatic epistemology with systems theory through "abstracted indeterminism." His short discussions of Dewey's perspectives of habits, knowing, meaning, imagination and values detract from the main focus and purpose of the second chapter of his book, namely to lay the foundations for connecting Dewey and systems theories as the core to his alternative way of thinking about education and schooling. These ideas would have been more easily connected, as well, to an experiential epistemology as described by Doll than a philosophy of situation.

Chapter 3 describes systems theory perspectives with the intention of making connections between systems theories and Dewey's theory of knowing. Cunningham provides a short history of systems theories, then distinguishes key traits of systems and perspectives of systems theories including process orientation, interactive complexity, interconnectedness, recursive dynamics and emergence. He introduces complex adaptive systems as living systems, including considering social

systems as living systems. Considering schools from the perspective of systems theories introduces relational connectedness and the potential for adaptive changes for school transformation (Fleener, 2002a). He describes how attempts to fetter the adaptive characteristics of a complex adaptive system such as schools, as we do when we have pre-defined curricula and standardized tests driving system organization, prevents their adaptive capabilities.

Cunningham's presentation of systems theories includes both philosophical and historical perspectives of systems theories. In an effort to be comprehensive and thorough, however, the reader may become lost in unnecessary detail in some places. For example, while systems thinkers need to differentiate the parameters of systems by distinguishing purpose, processes, interactions, integrated unity and emergent capabilities, the average reader may find these details detract from the argument Cunningham is making. Similarly, the definitions at the beginning of the chapter are somewhat pedantic and selective. For example, distinguishing "systemic thinking," "systematic thinking," and "systems thinking" seems to be an unnecessary tangent to his argument, namely, to understand how connecting systems theories with Dewey can provide an alternative ideological framework for understanding how to rethink schools.

There are also areas of Cunningham's presentation of systems theory that are overly simplistic. For example, the statement that "systems theory emphasizes the development and use of models to simplify complexity," (p. 46) ignores a variety of theoretical and research approaches to understanding systems. While some researchers, such as those at the Santa Fe Institute, choose modeling as their primary approach to understanding complex system behavior (Waldrop, 1992), journals such as the *Journal for Non-Linear Dynamics in Psychology and the Life Sciences* and educational researchers such as Stamovlasis and Koopmans (2016) present social science research that explores systems from a variety of perspectives using multiple research methodologies and approaches beyond modeling.

I applaud the effort to present systems theories (especially complex adaptive systems theories) to educators and educational researchers, and I whole-heartedly see the connections between Dewey and complex adaptive systems thinkers. Cunningham's historical presentation, however, misses some key aspects of the development of systems thinking and its off-shoots. While his chapter does not need to be a comprehensive review of this research—there are books that do that (see, for example, Castellani & Haverty (2009), Gleick (1988) and Waldrop (1992)) —his

introduction to the history needs to be more inclusive. The early thinkers in systems theories that he cites, namely, Alexander Bogdanov and Ludwig von Bertanlaffy, were part of a much larger conversation of interdisciplinary thinkers, including scholars such as Margaret Mead and her then-husband Gregory Bateson, Norbert Weiner, who along with Bateson developed the field of cybernetics, and W. Ross Ashby, whose early writings based in systems approaches emerged into the field of artificial intelligence (Pias, 2016). The overall focus of these various early efforts was to understand underlying structures and relational dynamics from multidisciplinary perspectives without losing site of the whole-system dynamics, including interconnectivity and emergent behavior.

Castellani and Hafferty (2009), in their book *Sociology and Complexity Science: A New Field of Inquiry*, develop a pictorial view of the history of the relationship between systems theory, dynamic systems theory, cybernetics, artificial intelligence and complexity sciences. (See Figure 3, below.) This representation succinctly shows the historical development of complexity sciences with roots in systems theories, cybernetics and dynamic systems analyses and as related to yet distinct from dynamical systems, fractal geometry and chaos theory. While the picture is, itself, complex, the aesthetics of it reveal the emergent relations of these many varied perspectives. Within complexity science, understandings of self-organization, adaptation/autopoiesis, emergence, dynamics within systems, complexity theory epistemology, global networks, and web sciences have all evolved, creating a rich and textured set of interrelated understandings.

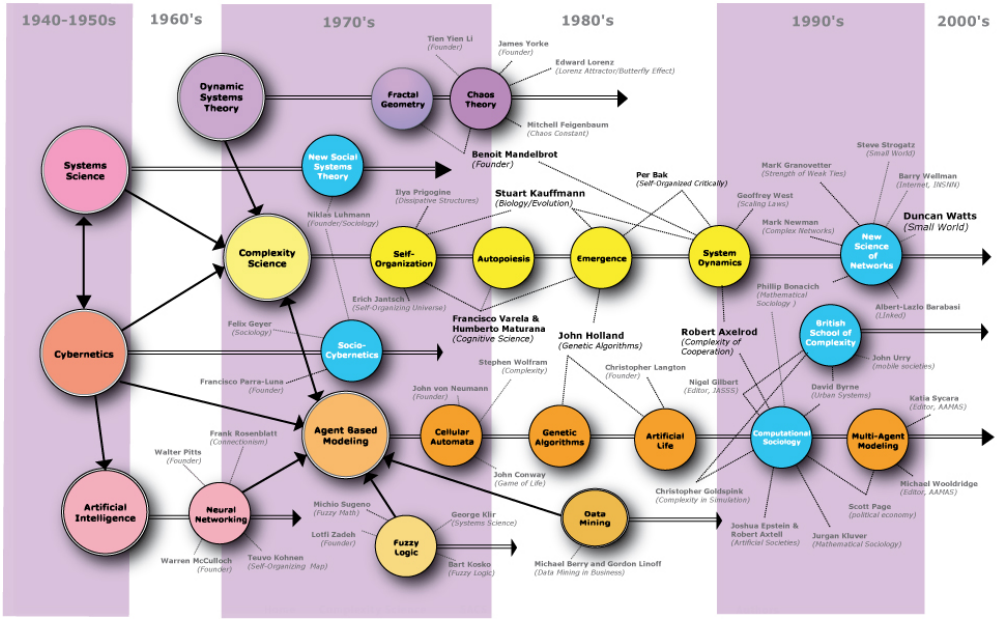

Figure 3: Castellani & Hafferty Map of Complexity Sciences

While the model above is just one interpretation of the evolution of the field of general systems theories, it is helpful to avoid confusing paradigms and jumping around this map as we think about systems. Later in his chapter, it appears Cunningham mostly identifies with complexity sciences as the lens through which he views systems, particularly focusing on ecological systems theory as it relates to social systems theory and systems science engineering (again, refer to Figure 3). "Schools have ecologies as well," Cunningham states (p. 49). He does bounce back and forth, however, between ecological social systems and epistemological complexity. These perspectives have origins in the thinking of Edgar Morin (2008), *On Complexity*, and Paul Cilliers (1998), *Complexity and postmodernism: Understanding complex systems.* Key functions of complex systems discussed by Cunningham include transformative and emergent change, and interactive and mutual interconnectedness. These functions of complex systems allow for operational openness with the environment while maintaining system identity.

Cunningham's consideration of various off-shoots of general systems theories is important, however, for providing a complex systems perspective that can help us understand individual learners as well as social organizations such as schools. Living, human systems, in particular, as complex systems, are directed by intelligence (memory, preference, habit, directed action, reflection) to "exhibit patterns of *choice* and *preference* which provide *directionality* and *intentionality* to action. Schools, for example, allow new participants as well as other resources and ideas to come in, but these are generally reshaped to fit into the system's existing norms and expectations" (Cunningham, 2014, p. 53). This is why change, both in individuals and schools, can be so difficult.

Cunningham makes a nice distinction between rigid social organizations and "purpose-seeking" organizations, driven by individual choice within the framework of over-all goals and values. "Purpose-seeking organizations consider the intentionality and freedom of each participant as essential: the system's function is to realize the ideals and goals of the participants, in addition, perhaps, to the overall shared goals" (p. 54). This is where Cunningham makes his strongest move to reconnect with his overall argument. Recall the triangle in Figure 1. This complex systems perspective provides both an ideological frame for transforming schools, connecting complexity perspectives with Dewey's process epistemology, and a social/ecological systems theory frame, connecting to Dewey's vision of democratic schooling and the potential for organic and adaptive change to occur. While Cunningham confuses his argument by collapsing these two different perspectives,

the ideological complex systems perspective and the purpose-driven social/political perspective, this core of his argument is noteworthy. As described above, the actual connection he appears to be making is with Dewey's pragmatic, process epistemology or, even more clearly, with Doll's experiential epistemology.

Dewey and Complex Systems Perspectives of Schools

The next three chapters of Cunningham's book consider the complexities of schooling (chapter 4), learners and learning (chapter 5), and teachers and teaching (chapter 6) through the lenses of Dewey's process epistemology and complexity sciences.

Chapter 4, "The Complexities of Schooling," expands the previous discussions to the context of schools by providing a nice connection between schools as social, ecological systems and features of complexity sciences relevant to system change. Cunningham describes how schools have nesting levels and layers of complexity, from individual students to entire school systems. He then employs this ecological systems theory view to consider key questions for changing schools. One should not ask questions such as, "How do we increase the amount of time devoted to reading instruction?" (p. 71), he states. "In a period of major transformations in the larger society in which schools operate … more fundamental questions need to be asked, such as: 'How is the transition to a global economy changing learning that will be important for these students as they move into adulthood?'" (p. 71).

Cunningham concludes this chapter with a discussion of the barriers to improving schools. As complex systems, schools work hard to conserve status-quo and stasis. Lessons learned from the complexity sciences include the importance of local autonomy, purposeful goals and shared vision, the role of perturbation to disrupt system complacency, and disrupting hierarchical command structures in favor of diffuse information flows and goals across the complex organization of schools. This latter approach to social system transformation, in particular, includes the idea that complex adaptive systems are capable of adapting when there is no centralized control. We see this with ant colonies, bee hives, murmuration of starlings, and food distribution practices in New York City. To attempt to control these complex social organizations works to the detriment of efficiencies and responsiveness of the system, as seen when, for example, during the fall of the Soviet Union, centralized control of food distribution strategies in Moscow led to tremendous food shortages. Although not specifically mentioned by Cunningham, many of the strategies he

recommends parallel contemporary efforts to transform business operations and leadership strategies to make them more adaptive, as discussed for example by Peter Senge (1990), Ronald Heifetz (1994), and John Kotter (2002).

Chapters 5 and 6 then serve as the application of his ideological core to the practices, realities and understandings of schooling. (See figure 4.)

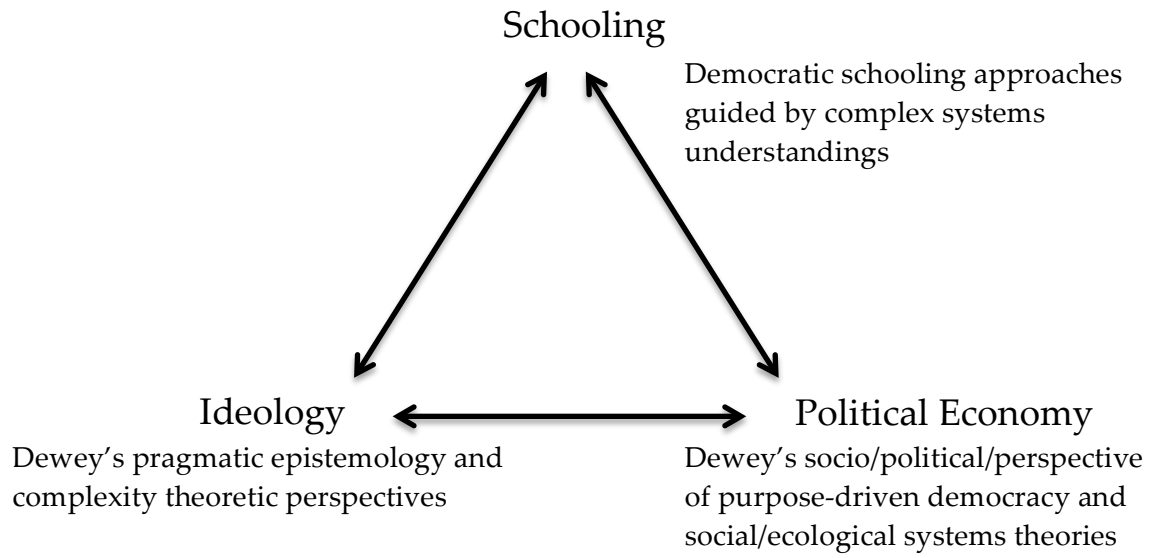

Figure 4: Cunningham's Argument Expanded

In chapter 5, Cunningham explores "the complexities of learners and learning" (p. 83) using Bronfenbrenner's ecological systems perspective. In some respects, the first part of this chapter revisits his explanation of systems theories in chapter 3. In other respects, it takes us beyond his prior argument in order to understand the complexities of schooling by introducing what appears to be a new conversation. Ecological systems theories might have served Cunningham as a focus both for examining learning in chapter five, and exploring the relationship between systems theories and education in earlier chapters.

In delineating the complexity of learning, Cunningham defines intelligence in terms of systems. Quoting Davis & Simmt, "[intelligence is] the capacity of a system to respond not just appropriately but innovatively to novel circumstances. The extent of a system's intelligence is linked to its range of possible innovations" (Davis & Simmt, 2003, p. 148 as referenced by Cunningham, p. 86). This leads nicely to Cunningham's description at the end of the chapter on the role of diversity and connectedness for system health, at the systems level, and complex learning,

including the role of culture, for children in school. These ideas come together and connect with Dewey through the idea of potential. In systems, potentials are the possible parameters for action. For individuals, "they operate in the realm of meaning, and connect ideals with reality and the future with the present" (p. 91). Supporting student learning to achieve greatest potential "requires an openness to the full range of possibilities that exist for any person at any point in time" (p. 93). The role of the teacher or caring adult is to push students to continue to expand their potential spaces of possibility. He continues this train of thought in the next chapter.

In chapter 6, "Teachers and Teaching", Cunningham describes the role of teachers and teaching in supporting student learning as the development of intelligence in the ever-expanding space of possibility. From systems theory, he emphasizes that open systems are most capable of creativity and adaptation when efforts at centralized control are removed, and he advocates for dismantling the educational practices and expectations that shackle teachers' creative capacity to facilitate student learning. Teaching relates to learning as part of the ecology of schooling. Quoting Davis and Sumara, Cunningham concurs that "teaching thus comes to be a participation in a recursively elaborative process of opening up new spaces of possibility while exploring current spaces" (Davis & Sumara, 2007, p. 64 as referenced by Cunningham, 2014, p. 99). Similarly, referencing Stables (2008), he agrees that "good teachers create rich experiences for students that promote human flourishing" (Cunningham, 2014, p. 99).

The Schooling We Need

In the final chapter of the book, "The Schooling We Need," Cunningham joins the ideology of schooling with current political economic realities in order to provide a perspective of schooling for the future. Building from systems theories ideas as they relate to both Dewey's process epistemology and his perspective of democracy, Cunningham argues that the schools we need should allow for, and indeed promote, creative potential and adaptive potentialities. As Cunningham states "we need to reframe schools as learning environments … [and] [l]earning needs to be redefined as growth" (p. 110). Cunningham represents democracy as the:

> ideal exemplar of distributed intelligence. Freedom and diversity foster more diversity. Diversity and difference are the engines of innovation. … Thus democracy is the best way to organize complex

> adaptive systems … to produce learning and innovation and to realize diverse human purposes. (p. 111)

Here Cunningham might bring Dewey back into the conversation. While democracy, in principle, should support diversity of ideas, we also see how the tyranny of the majority can silence diversity and squash innovation. The third leg of the argument Cunningham is presenting, which centers on the political economy, neglects to bring in Dewey's socio/political perspective of a purpose-driven society, which serves as a critique of our imperfect democracy and provides guidance for subversive educators striving to affect change toward a more perfect democracy.

Reaching the ideal of a democratic society, as Cunningham describes it, may require a more critical and less ideological stance toward education. In educating for tomorrow, and in changing schooling, schools can serve as agents of change. While Cunningham focuses on the challenges to schools as dampening their adaptive capabilities, there is also an important function schools can play in perturbing our social systems and promoting change. For example, Cunningham describes how standardized tests, mandated curricula, teacher performance measures, and so on, dampen the adaptive capabilities of schools to provide for the "education we need" but does not go on to explore how schools can become agents of change in our democratic society. While Cunningham provides strategies to work from within the system, for teachers to support a "curriculum for human flourishing" (p. 112), true change of the kind Cunningham (and Dewey) desire, requires revisiting our core democratic values and principles and the notion of education as an instigator of change.

In summary, Cunningham's book takes on a very difficult task. He creates a complex argument that describes how educational change may occur. Building upon the ideological perspectives of Dewey's epistemology and complexity theories, we can gain an understanding of how to unfetter the potential of students and schools and rethink education. Cunningham makes great strides in accomplishing this part of the argument. Missing, however, is the other leg, even as he defined it, of how fundamental change of schooling is possible. This is the role that the revisioning of democracy must play. Without addressing the challenges of schooling from a broader perspective, especially as connected with 21st century demands, Cunningham's arguments are somewhat naïve and overly simplistic and optimistic.

Our current form of representative governance does little to instill confidence that alternative perspectives are honored and that individuals possess a sense of personal control over processes of community decision making. The political impasse seen in the United States goes beyond the Republicans fighting the Democrats and vice versa, but is inherent in a system that no longer has the capacity to develop collective and shared insights and wisdom, leading to a sense of powerlessness among the populate. This sense of powerlessness or hopelessness explains why so many people in the United States become disillusioned with the process and do not vote.

Local situations require approaches to solving problems that apply specifically to those situations: these cannot be legislated or applied across all contexts in name of equity. We all should care about the health of the system as a whole, and particularly about the reality that not all of our students receive opportunities for quality education. But we should also recognize that supports to schools may need to be considered differently based on their qualitative and contextual challenges. Schools as social systems have their own challenges that might include high concentrations of children in trauma situations, poverty, or experiencing homelessness. The strategies and supports for these schools need to be tailored to the unique characteristics of the schools, communities and children they serve. As Cunningham suggests, this has huge implications for how we fund schools, train teachers, and assess educational attainment and goes beyond releasing the adaptive potentials for student learning in the classroom.

To truly unleash the power of learning through openness, we can look to the spread of the internet and its impact on the economy. Don Tapscott (1996, 2012) describes how technology is opening the world in ways that are transforming how organizations interact. Information and collaboration through the internet have created a new kind of system organization that is more open and adaptive, more communal and collaborative, and more equitable by challenging traditional leadership roles. Four principles of a more open world due to the internet, according to Tapscott, are: (1) system and organizational boundaries are becoming more porous and open to possibilities through collaboration; (2) organizations are driven by an ethic of transparency because the internet demands and supports information sharing; (3) intellectual property and ownership of ideas yield to a new kind of distributed knowing and organizations will embrace this new commons as a place where synergies of research and innovation are supported through the collaborative process; and (4) a new kind of freedom and opportunity result from the open

distribution of knowledge and power, placing demands for leadership to be more distributed and diffuse through the collective consciousness of the internet.

The internet culture fundamentally changes how social systems interact and provides an environmental context for learning at a societal systems level. While Cunningham focuses on providing schools with more flexibility for evolving, he has not gone far enough in recognizing how the boundaries of education have changed, how education must change to become more transparent with diffuse information, and how the parameters of what we call schooling are fundamentally limiting to the possibilities of creating educational futures – the schooling we need and the schooling our children deserve.

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Notes

[1] Although Cunningham refers to "systems theory" I tend to use "systems theories" to capture the broad ranges of ideas and ways systems perspectives are used as the basis for understanding, modeling or interpreting phenomena.