Reconstructing A Modern Definition of Knowledge: A Comparison of Toulmin and Dewey

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An important debate in philosophy centers on the demarcation of modern and post-modern movements. In challenging the legitimacy of this debate, philosopher Stephen Toulmin claims that, depending upon the definition of modernity, we may not be in a "post-modern" phase of human history. Rather Toulmin argues that we are in a third phase in the history of modernity.[1] This third phase combines the humanism of the sixteenth century with the scientific thought initiated by Descartes and Newton in the seventeenth century. Toulmin's analysis of modernist theories of knowledge provides insight into the construction of modernity and the development of rationality as the basis for knowledge by blending history, pragmatism and hermeneutics. Toulmin believes that a "modern" revival of Renaissance humanism would mean: a reintegration of humanity with nature; a restoration of respect for Eros and the emotions; more effective transnational institutions; a relaxation of the traditional antagonisms of classes, races, and genders; an acceptance of pluralism in science; and a final renunciation of philosophical foundationalism and the quest for certainty.[2] How does Toulmin propose these changes be achieved?

In its present state, Toulmin suggests that philosophy has a limited number of options:

> It can cling to the discredited research program of a purely theoretical (i.e., "modern") philosophy, which will end by driving it out of business; it can look for new and less exclusively theoretical ways of working, and develop the methods needed for a more practical ("post-modern") agenda; or it can return to its pre-17th century traditions, and try to recover the lost ("pre-modern") topics that were sidetracked by Descartes, but can be usefully taken up for the future.[3]

Toulmin advises against either "digging in" with old notions or of following the post-modern view of giving up all grand theorizing and simply participating in conversations about the world from a philosopher's perspective, as philosopher Richard Rorty so eloquently suggests. Rorty, however, diminishes the role of philosophy to just another discipline, another voice in the conversation.[4]

Instead, Toulmin suggests that philosophy revisit or more specifically reappropriate pre-seventeenth century traditions of Montaigne, Erasmus, Rabelais, and the spiritual, social reformer side of Bacon.[5] This reappropriation of what Toulmin calls the "humanist" tradition of the Renaissance strikes a "better balance between abstract exactitude needed in physical sciences and the practical wisdom typical in fields like clinical medicine."[6] Thus, Toulmin advocates a blend of rhetoric and science, which should transform both enterprises.

The purpose of this paper is twofold. The first part of this paper evaluates Toulmin's position that a blending of pre-seventeenth century humanist traditions and modern science could transform modernity in such a way that would effectively challenge the abandonment of modernity for a "post-modern" condition. The second part examines some of the similarities between Toulmin's position and the epistemological position of pragmatic philosopher John Dewey. Dewey also makes the claim that the debate in philosophy had rested, since the 1630s, on too passive a view of the human mind, and on inappropriate demands for geometrical certainty that misdirected modern science.[7] Before examining Toulmin's position, we first outline modernity and the problem of knowledge.

Modernity and The Problem of Knowledge

There are of course numerous and varied modernist definitions of what constitutes knowledge. Some theories focus on content or "knowledge that," while others emphasize methods or "knowledge how." Regardless of the specific orientation, modernist theories of knowledge generally share three defining characteristics taken from the legacy of Descartes: (a) a quest for certainty; (b) a clear delineation between subject and object; and, (c) a view of progress that is always forward moving toward a unified system of knowledge. According to Toulmin, the modern era fuses the idea of cosmos (the order of nature) with the polis (the order of society) to create a harmonic world -- the cosmopolis. The philosophical idea generated from this view is that the structure of nature reinforces a rational social order.[8] In a cosmopolis, which is the ideal rational city, the focus is on certainty, objectivity, and universal, unified systems of knowledge.

The quest for certainty within modern theories of knowledge is closely aligned with the application of science as the pivotal discipline. This quest, translated into twentieth century terms reflects science "as an abstract enterprise, whose progress could be defined and appraised without reference to the historical situation in which that progress was made."[9] The goal of "getting reality right" and of seeking universal principles is ultimately aimed at prediction. This prediction is aimed at controlling nature as well as oneself by applying a technical rationality generated by scientific method. In the seventeenth century, the authority of science replaced the authority of the church of the premodern era.

In modern times, the secular disciplines of science triumph over both the sacred and the humanist tradition of the Renaissance as the means to achieving reason within a modern nation state. The link between rationality and science is a primary feature of the modern, liberal tradition. Thus, any challenge to a modernist quest for certainty, including a challenge from pragmatic philosophy, must redefine this crucial link between rationality and science.

Secondly, in addition to a quest for certainty, modern theories of knowledge assume an objectivity that relies on technical rationality. It is assumed that reason is bound by, and defined in terms of, scientific technology.[10] Part of this technical rationality rests upon an objectivity that can be achieved by clearly delineating between subject and object. Modernist theories of rationality assume that the inquiring subject is separate from the world and is capable of consciously influencing an independent human will. Moreover, technical rationality emphasizes implementation of means over choice of ends and negates practical world experience. As Lather suggests, this classical liberal view of a separate, self-directive, potentially fully conscious, shapeable subject armed with natural rights and in pursuit of progress became known as atomistic individualism.[11] In general, modernist theories of knowledge focus on how an atomistic individual or group of these individuals, who are empowered by scientific reason, solve problems and order an objective world. Thus, science generated from modern epistemology seeks objectivity through carefully controlled procedures aimed at preventing interests, desires, and values from influencing outcomes.

Finally, along with a quest for certainty and belief in objectivity, the third primary assumption within modern theories of knowledge is that the achievements of science translate into forward moving progress toward a unified system of knowledge. Science, based on its predictive powers, is moving us away from ignorance and towards explanation and prediction and a greater freedom supposedly associated with these achievements. Progress is generally viewed as movement toward a single, absolute truth by revealing universal principles obtained by a unified method of science.

Toulmin's Challenge to the Standard Account of Modernity

Toulmin argues that even though this linear view of progress dominated from the seventeenth century to the mid-twentieth century, as early as 1750 some of the assumptions supporting this view of progress and the mechanical nature of the universe were partially and gradually undermined as

human experience revealed contradictions and challenges.[12] But the standard account of modernity was that it was "unquestionably 'a Good Thing'; and we only hoped that for the sake of the rest of humanity, the whole world would soon become as 'modern' as us."[13] Toulmin argues that our picture of medieval world was constructed in such a way as to make the modern world, with its commitment to rationality, science, and the nation state, appear more progressive.

Toulmin claims that the standard account of progress is misleading. Pre-seventeenth century thinkers, particularly Montaigne, appreciated the diversity and the complexity of human life, which led to tolerance and living with difference.[14] Erasmus, Montaigne, Rabelais, and Bacon retain historical concerns and contextualize their ideas using ethnography, poetry, practical experience, and history. These important concerns, tolerance and living with difference, have been recently highlighted by numerous philosophical movements, particularly by some strains of pragmatism, feminism, critical theory, hermeneutics, and postmodernism. Toulmin argues that concerns about diversity and tolerance are not new, but can be found within the modern tradition. By redefining the origins of modernity, Toulmin contends that sixteenth century humanists are the founders of modern humanities, and as such, an important part of modernity itself. Thus, modernity, at least for Toulmin, had two distinct starting points: a humanism grounded in classical literature, ethnography, and history; and a scientific origin rooted in seventeenth-century natural philosophy.[15] The reunification of these two studies can be regarded as a third phase of modernity, rather than a break from the past. The humanist tradition contains a deeper contextualization, especially when rhetoric stresses the question: "Who addressed this argument to whom, in what forum and using what examples?"[16] Insights from rhetorical perspectives, which highlight the complexity of the context in which knowledge production occurs, could serve to enhance scientific study.

Based upon his research on the conditions of sixteenth and seventeenth century Europe, Toulmin finds that the quest for certainty through epistemology and science can be understood as a timely response to a specific historical challenge of economic and social crisis -- when toleration failed and religion took to the sword. The response was to give up modest skepticism (belief in ambiguity, uncertainty, complexity, limits of human understanding) of the humanists for rational proofs to underpin beliefs with a certainty that would be neutral among all religious positions.[17] Thus, modern science lost an important lesson advanced by the skeptics -- that philosophical theories tend to overreach the limits of human rationality.[18]

In the late 1950s, C. P. Snow contributes to the debate over the separation of science and humanities by examining the professionalization of engineers, doctors, and other technical experts, compared with education of administrative elites and civil servants. While he criticizes both the poor training that science majors receive in humanities and the equally poor training that those who major in the humanities receive in science, Snow concludes that the humanities have more to learn from science than vice versa.[19] Toulmin, however, reaches the exact opposite conclusion. By reexamining the historical roots of Cartesian rationality and its impact on scientific thought since the seventeenth century, Toulmin advocates reappropriating some of the insights of the humanist tradition of the Renaissance in order to reshape the sciences. Science needs to consider sixteenth century humanism's: skepticism; modesty about the power of human knowledge; respect for diversity and the complexity of human life; tolerance; and concern for the concrete, particular, and local aspects of living. In this sense, Toulmin suggests giving equal respect to the benefits of both the humanities and the sciences.[20] Toulmin's analysis of modernist theories of knowledge provides insight into the construction of modernity and the development of rationality as the basis for knowledge by blending history, pragmatism and hermeneutics.[21]

Dewey's Challenge to Modern Epistemology

Many of Toulmin's arguments advanced here were articulated by pragmatic philosopher John Dewey. Dewey claims that the debate in philosophy had rested, since the 1630s, on too passive a

view of the human mind, and on inappropriate demands for geometrical certainty.[22] Dewey rejects the quest for certainty and the notion of absolute objectivity, and stresses instead the human agency and subjectivity involved in inquiry. The inclusion of subjectivity and human agency from a transactional epistemological perspective are key concepts in transforming how knowledge is viewed. Dewey defines reality as the world we experience, but this lived world is not the world that is known.[23] Selectivity of purpose and mediation of experience through language and inquiry are problematic, but unavoidable conditions for all human beings.

In moving philosophy away from a Cartesian centered philosophy, Dewey connects philosophy with practice, experience, and critique; philosophy then becomes a form of thinking, a means of assessing the kind of society in which we live and of determining conduct.[24] The traditional philosophical concern about grounding knowledge is replaced by a concern for philosophy as a form of cultural criticism.

Dewey replaces two key constructs of modern epistemology -- certainty and separate subjectivity -- with uncertainty and a transactional view that emphasizes the relational quality of subject and object. It is this combination of uncertainty and the constitutive, transactional relationship between subject and object that radically changes our view of what constitutes knowledge.

First, certainty is replaced with a quest for ways of knowing that address specific social problems. In other words, "getting reality right" is replaced with concerns about improving the conditions of life. Prediction is less important to pragmatists than improving practice. Science is selected as the paradigm for creating knowledge, but three assumptions distinguish a pragmatic view of science from views held by empiricists and positivists. These differences are: science should address questions of value; science needs to recognize how subjectivity is a part of objectivity; and, science and nature should be viewed in continuity with one another.

Second, separate subjectivity is replaced with a transactional subjectivity, which highlights the dynamic, interconnectedness of subject and object of knowledge. Transactional subjectivity makes knowing a complex combination of habits and purposes generated from an individual embedded in and mediated by a historical, social, and cultural context. Knowing is a constitutive or transformative activity, a new meaning takes the place of an old meaning through a process of public exchanges, thus changing both subject and object of knowledge in some fashion. Thus, both public and private processes are involved.

Admittedly, one significant problem with Dewey's work is that he avoids proposing any general criteria or overarching theory of knowledge. But Dewey's shift to focusing on a transactional relationship between knower and known foregrounds certain conditions for inquiry that undermine certainty and objectivity which is so critical to modern epistemology. A transactional epistemological perspective influences conditions for inquiry by foregrounding: (a) the need for communication; (b) an interest in change and indeterminacy; (c) a consideration of context; (d) a recognition of the connection between theory and value; (e) a redefinition of subjectivity and objectivity that acknowledges values, interests, and beliefs; and, (f) a focus on practice. The power of human purposes and the influence of habits make inquiry a messy affair. While the undermining certainty and objectivity opens space for more voices, the problem of access to the process of inquiry remains an issue of concern.

While Dewey does not articulate as fully as Toulmin the rhetorical nature of scientific inquiry, he appears to have made a number of significant discoveries about methods of inquiry that align him more with the humanist tradition than has been previously thought. The importance of community in legitimating knowledge claims, the need for communication, a desire for philosophy to focus on practical problems, and the abandonment of the "quest for certainty" serve to place him outside of the traditions of modern science.[25]

Moreover, by rejecting any notion of value-neutral inquiry, pragmatic thinkers shift the focus to the combination of methods and attitudes that enhance evaluation and criticism of both conditions and standards of inquiry. A major difficulty of Deweyan pragmatic theory of knowledge is found at this point: How do inquirers step back at some level and become cultural critics? How do we achieve this critical stance? Clearly, from a democratic perspective, the success of this process also depends upon broad participation, so that all views are represented. And this process is not articulated by Dewey.

One of the major aims of Dewey's transactional perspective is to make a clear break with the methods of modern science associated with Cartesian epistemology and its notions of progress towards universalism. Dewey attempts to make this break, albeit at times unsuccessfully, through his critique of modern science, his antifoundationalism, and his development of a theory of knowledge premised on a rich doctrine of experience. The primary focus of a transactional perspective is on possibility, understanding, and meaning through broad-based inquiry rather than certainty, prediction, and capturing reality through science.[26]

One of the educational implications of a transactional perspective is that it undercuts the basic division between culture and nature, and thereby could transform the nature of subject-matter of schools by rejecting the fundamental division between science and humanities. Cartesian dualism serves to separate mind and nature, human concerns and science, and perpetuate divisions rather than commonalities. This division upholds a narrowness in humanities as well as a narrow, mechanistic view in the sciences. Studies in the sciences and humanities from a transactional perspective demonstrate a different emphasis on a common reality. A transactional view of subject-matter means that science becomes the study of nature which includes human and cultural influences, and the study of humanity and culture includes bio-physical factors ordinarily reserved for the private realm of science.[27] An ecological philosophy also shares this view as part of a transactional perspective that brings more unity to human beings and their world.

Toulmin praises Dewey for effectively deconstructing a theory-centered style of philosophizing, "one that poses problems, and seek solutions, stated in timeless, universal terms."[28] Toulmin characterizes Dewey's writings as deconstructive, in that they undermine modern epistemology's foundations. In Toulmin's view both Rorty and Dewey "read the burial service" for certainty, sytematicity, and the clean slate, recognizing instead the need to start "from where we are, at the time we are there."[29]

While both Dewey and Rorty conclude that philosophy turned into a kind of modern dead end as a result of Descartes, Toulmin faults them for not asking why this quest for certainty dominated at that particular time. As Toulmin correctly points out, asking why is a rhetorical question, which acknowledges the importance of audience, a philosophical approach that considers the particular context crucial to the development of ideas. "By ignoring such historical issues, however, their own arguments exemplify the continuing split between rhetoric and logic -- a feature of the very position they claimed to reject."[30] It is insufficient to diagnose the so-called errors of the past without considering the historical context, which provides insights so relevant to philosophy.

Conclusion

In assessing the critique of modern theories of knowledge made by pragmatists, Toulmin rightly concludes that a neo-pragmatist like Rorty exemplifies the split between humanism and modern science by reducing all subject matter to rhetoric, instead of seeking to balance each with insights from the other. In this paper, I argue that the Deweyan combination of anti-dualistic, anti-foundational, and transactional epistemological perspectives supports just such a balance between humanism and science. Dewey's position, especially as he struggles to revise Cartesian epistemology (although not always consistently or successfully), shares a number of features of

Renaissance humanism that Toulmin finds so useful in reframing and redefining the term "rationality."

Dewey's embrace of scientific method and the language of science tends to overshadow his fundamental rejection of universalism and his interest in what is changing, specific, and concrete.[31] Thus, we can conclude that Dewey's commitment to science as the model for inquiry contain both strengths and weaknesses.

Dewey recognizes the key role played by science in complex, modern, industrial societies, and thus seeks to reform its basic assumptions. His epistemological shift, of locating human beings within nature rather than outside of it, provides new assumptions upon which to construct inquiry. The experimental method of science has the advantages of using experience, being concerned with change, depending upon communication, using standards that emerge from practice, and dealing with concrete problems.

At the same time however, Dewey is caught up by modernist notions of progress. In an effort to break with the traditions of the past he creates dualistic categories and ignores the historical context of ideas in order to advance his own position. Additionally, Dewey at times sounds as if a general method of inquiry is an adequate enough description of inquiry that can be applied to all areas. Thus, he undermines his own efforts to radically reform epistemology.

Throughout his career, Dewey argues against any view of experience that denies its transactional character, that completely separates mind from body, subject from object, or self from world. Boisvert summarizes the importance of Dewey's position:

> Subject and object, terms inherited from epistemology-centered philosophy, were no longer to be understood in the traditional manner. Instead of a subject as spectator examining the realm of objects, there is now the biological environment which involved the participation of organisms in their surroundings. The environment or situation provided the dynamic unity of interacting entities.[32]

Dewey's concept of the transactional relationship stands at the core of his arguments against dualism. Boisvert argues that Dewey's critique of modernism is significant in changing the trajectory of modern epistemology: "Dewey has opened the door to post-modern philosophy by revealing the ways in which the modern map of generative ideas is flawed, sterile, and truncated."[33] While Toulmin would most likely disagree here about the need to move toward post-modern philosophy, he would agree that Dewey attempts to change the trajectory of modern epistemology.

Toulmin argues that it is evident that some transformation of science has already begun to take place. By the end of the twentieth century, the scientific elite and the general public no longer believe that nature is generally stable, that matter is purely inert, that mental activities must be entirely conscious or rational, that "objectivity" and "non-involvement" is equated with scientific work, or that the distinction between "reasons" and "causes" necessitates the separation of humanity from nature.[34]

Toulmin believes that a "modern" revival of Renaissance humanism would mean: a reintegration of humanity with nature; a restoration of respect for Eros and the emotions; effective transnational institutions; a relaxation of the traditional antagonisms of classes, races, and genders; an acceptance of pluralism in science; and a final renunciation of philosophical foundationalism and the quest for certainty.[35] While it may appear that these changes are too optimistic and too radical to ever be implemented in a society that relies so heavily on Cartesian rationality, Toulmin points out that some of these changes have already taken place in the natural sciences. Nuclear physicists show concern about the politics of nuclear weapons, engineers demonstrate concern about the environmental impact of its projects, and doctors address the moral and technical aspects of care.[36]

Toulmin argues convincingly that the received view of modernity builds upon false or misleading assumptions about the nature of seventeenth century thought and why a quest for certainty developed. The rise of rational methods of science and philosophy grew out of political and economic instability, religious intolerance, ideological slaughter, and a devaluing of Renaissance humanism.[37] Thus, despite the rising interest in emancipation and democratic participation in many of the newly formed nation states of the seventeenth and eighteenth centuries, the need for stability undergirded a quest for certainty that dominated until well into the twentieth century. Science needs to consider sixteenth century humanism's: skepticism; modesty about the power of human knowledge; respect for diversity and the complexity of human life; tolerance; and concern for the concrete, particular, and local aspects of living.

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1. Stephen Toulmin, *Cosmopolis: The Hidden Agenda of Modernity* (Chicago: University of Chicago Press, 1990), 205.
2. Ibid., 159.
3. Ibid., 11.
4. Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton: Princeton University Press, 1979), 389.
5. Bacon places constraints on the use of theory, sharing with alchemist of his time a distrust of intellect and an interest in social reform. Despite his numerous statements about mastering nature, Bacon is viewed as a transitional figure between humanist and rationalist traditions (Toulmin, *Cosmopolis*, 44; see also Evelyn Fox Keller, *Reflections on Science and Gender* (New Haven: Yale University Press, 1985).
6. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, xii.
7. John Dewey, *Quest for Certainty* (New York: Minton, Balch, and Company, 1929), 23.
8. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, 68.
9. Ibid., 137.
10. Donald Schon, *The Reflective Practioner* (New York: Basic Books, 1983).
11. Patti Lather, *Getting Smart: Feminist Research and Pedagogy With/in the Postmodern* (New York: Routledge, 1991), 161.
12. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, 167.
13. Ibid., 13.
14. Ibid., 30.
15. Ibid., 43.
16. Ibid., 31.
17. Ibid., 81.
18. Ibid., 29.
19. C. P. Snow, *The Two Cultures* (Cambridge: Cambridge University Press, 1959/1964).
20. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, 180.
21. The case study of Barbara McClintock demonstrates how science might change if these humanistic characteristics were considered. McClintock exemplifies this combination in her research, where she rejects the hard and fast divisions between nature and mind. Her experiments reflect empathy, respect, and affection for nature, which results in a more open-minded, less hierarchical, more creative approach to knowledge construction. Her transactional perspective enhances her sensory awareness and serves as a source of her powers as a scientist (see Keller, *Reflections on Gender and Science*, 164).
22. John Dewey, *Quest for Certainty*, 23.
23. Ibid., 294.
24. John Dewey, *Democracy and Education* (New York: Macmillan Company, 1916/1966), 322-24.
25. See also James Garrison, "Realism, Deweyan Pragmatism, and Educational Research," *Educational Researcher* 23, no. 1 (1994): 4-14.
26. Dewey's transactional epistemological perspective is particularly attractive to some environmental philosophers, philosophers of science, some feminists, and some neopragmatists, who today seek to revise methods of inquiry for legitimating knowledge claims by making them more responsive to democratic concerns.
27. To his credit, Dewey selects biological science rather than physics as the scientific model. The study of biology focuses on the relationship of organism and the environment, a view much more consistent with a transactional perspective than the abstract, laws of physics. An emphasis on biology rather than classical physics, with its hierarchical models of simple, static systems, suggests interest in interactive models of complex, dynamic systems.
28. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, 11.
29. Ibid., 179.
30. Ibid., 36.
31. John Dewey, *Reconstruction in Philosophy* (Boston: Beacon Press, 1920), 47.
32. Raymond Boisvert, *Dewey's Metaphysics* (New York: Fordham University Press, 1988), 23.
33. Ibid., 200

34. Toulmin, *Cosmopolis: The Hidden Agenda of Modernity*, 143.
35. Ibid., 159.
36. Ibid., 182.
37. Ibid., 170.