MODERNISM, POSTMODERNISM, AND INTERDISCIPLINARITY

by

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Abstract: While postmodernist and modernist approaches to a range of epistemological and methodological issues are well established, there is less explicit attention given to the contribution of interdisciplinarity to these same questions. Through a comparison/contrast format, this paper will examine the particularities of modernist, postmodernist, and interdisciplinary theory and practice, and follow with observations regarding the ways in which, despite complementarities, the interdisciplinary position overcomes problems often associated with modernism and postmodernism. While in other arenas different aspects of these contested concepts might be explored, this study promotes inquiry that rigorously addresses how scholarship can be advanced and how the academy can exercise its responsibility in the public sphere.

This paper compares and contrasts interdisciplinarity with both modernism and postmodernism. Unfortunately, interdisciplinarity and postmodernism are often conflated since both exhibit some degree of skepticism toward the disciplinary structure of the academy. While postmodernist and modernist attitudes toward a range of epistemological and methodological issues are well established, such attitudes are often implicit at best in the practically-oriented literature on interdisciplinarity. Yet Newell (1998, p. 561) has noted that until the assumptions underlying interdisciplinarity are clearly articulated, it is all too easy for critics "to ascribe to all interdisciplinarians the assumptions and worldview of a minority of the profession." He continues: "It becomes important then to disentangle the characteristics of interdisciplinarity from the characteristics of valuable complementary perspectives such as feminism, postmodernism, anti-logical positivism,

and left-wing politics." This paper will outline a consistent and distinct set of interdisciplinary attitudes toward epistemological and methodological questions.

The structure of this paper is straightforward. After some opening remarks, each substantive section begins with the statement of a *modernist*, *postmodernist,* and *interdisciplinary* position on a particular epistemological, theoretical, or methodological issue. What follows is a brief discussion of how the interdisciplinary position overcomes problems often associated with the modernist and postmodernist positions.

Modernism and postmodernism are both contested concepts. It is not the purpose of this paper to seek an unattainably precise definition of these.[1] One barrier to such an exercise will be familiar to interdisciplinarians: Modernism operated(es) differently in different fields, and thus the focus of postmodern critique has also differed by field (see Cullenberg, Amariglio & Ruccio, 2001, p. 23). Not only do scholars define modernism and postmodernism differently, but many scholars are influenced by various modern or postmodern attitudes while disdaining either title. This paper focuses on various arguments widely associated with postmodernism, and the opposing arguments thus necessarily associated with modernism (though note that some postmodernists reject this sort of oppositional strategy as inherent in modernism, and see themselves as rejecting direct contradictions). In each case, the attitude of interdisciplinarians is the focus of investigation. While it is neither essential nor possible that this paper define modernism or postmodernism uncontroversially, it will strive to carefully define and justify a set of consistent interdisciplinary attitudes on each point; these will be grounded in the growing literature on the theory and practice of interdisciplinarity. Generally these will be found to be "Golden Means" between modernist and postmodernist thought (see Szostak, 2004, for an extension of the concept of the Golden Mean to the realm of epistemology and methodology). This paper follows the strategy recommended by Alvesson (2002, p. 13) of discussing particular postmodern arguments in turn while not losing sight of the complementarities among them; in so doing the same treatment is accorded interdisciplinary attitudes.

To emphasize: Few scholars if any would agree with every position defined as postmodernist (or modernist) in what follows. Indeed some of these statements are extremes to which most postmodernists (modernists) disagree to varying extents. The main purpose of this paper is to identify the interdisciplinary perspective: If many postmodernists (modernists) find interdisciplinary positions congenial, so much the better. The paper thus re-

lies heavily on general discussions of postmodernism and modernism rather than detailed examination of primary works.

Interdisciplinarity too is a contested concept (in part because it also operates differently depending on the disciplines involved). The key element of interdisciplinarity for the purposes of this paper is that it reflects a belief that enhanced understanding of particular problems, issues, and themes is possible by *integrating* insights from different perspectives. While such a belief is not always explicit in the literature on interdisciplinarity, it is at least implicit in various definitions of interdisciplinarity, including my own:

> *Openness* to the application of *all* theories and *all* methods to *any* set of phenomena. Interdisciplinarians are open to applications of each of the five types of ethical perspective. Interdisciplinarians believe that research should be evaluated solely in terms of whether it contributes to our collective understanding. (Szostak, 2003a)

> A process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline or profession. … Interdisciplinary studies draws on disciplinary perspectives and integrates their insights through construction of a more comprehensive perspective. (Klein & Newell, 1996)

Why, after all, bother integrating across theory, method, phenomena, or perspective unless in the pursuit of enhanced understanding? This simple belief puts interdisciplinary scholarship at odds with those strands of skeptical postmodernism that deny the very possibility of scholarly understanding. Likewise, the insistence on integration rests on an assumption that disciplinary perspectives are partial and biased, an assumption that accords poorly with certain precepts commonly associated with modernism. While it is important to appreciate these broad beliefs, it should nevertheless be stressed that interdisciplinarians can, do, and should debate just how partial and biased disciplinary insights are and just how optimistic one should be about the possibility of enhanced scholarly understanding.

Rosenau (1992) distinguished between affirmative and skeptical postmodernisms. Affirmative postmodernists back away from certain skeptical arguments far enough to retain a belief that some sorts of scholarly understanding are possible. Affirmative postmodernists—and these may be the vast majority of postmodernists—may thus find that they agree with many of the attitudes urged upon interdisciplinarians in what follows. The post-

modern positions that are outlined below are those of skeptical postmodernism. Like affirmative postmodernism, interdisciplinarity takes skeptical concerns seriously but seeks to identify ways in which scholarly understanding can be enhanced. Indeed, the argument advanced in this paper is that the roots of postmodern skepticism lie in the inherent limitations of disciplinary approaches to understanding, and the appropriate response to these limitations is not (skeptical) postmodern despair but the constructive program of enhanced understanding advocated by scholars of interdisciplinarity. At the very least, despair would seem unwarranted until such time as interdisciplinarity has been fully embraced, tested, and found wanting by the scholarly community as a whole. Rosenau questions whether affirmative postmodernism is inherently inconsistent in accepting skeptical arguments while still holding out (some) hope of enhanced understanding (1992, p. 178). This paper will outline an internally consistent interdisciplinary outlook.

The interdisciplinarian is accustomed to seeking the kernel of truth in different arguments, while recognizing their limitations. The approach taken in this paper toward defining an overall interdisciplinary attitude is thus entirely consistent with interdisciplinary practice on the ground. Neither modernism nor postmodernism will be rejected or accepted in their entirety. The starting assumption is that both probably provide limited but valuable perspectives on how scholarship should proceed. Thus the goal should be to take what is beneficial for scholarly understanding from each. Notably, some postmodernists would recommend that all scholarly approaches—including modernism and postmodernism—are necessarily transitory and incomplete (Cullenberg et al., 2001, p. 22), and thus might embrace an argument for integrating them. They would, in other words, see the purpose of postmodernism as inviting scholars to transcend modernism, and thus might be open to a coherent plan for doing so that explicitly grapples with postmodern concerns. Postmodernists are often accused of not training their many critiques upon themselves: In that sense an exercise that critiques postmodernism is more congruent with postmodern sensibilities than the activities of some postmodern scholars.

Dow (2001) makes a compelling argument that postmodernism is the antithesis of modernism, and thus will inevitably be transcended by some synthesis of the two. (Jack Amariglio in commenting on her paper notes that this desire for a "third way" is widely felt and can be couched in language that eschews the intellectual baggage associated with thesis/antithesis/synthesis.) Dow argues that (skeptical) postmodernism as "anything goes" is unsustainable, for there is then no good reason to bother with scholarly ar-

gument; however, it has brought modernist precepts into question such that a return to modernism is impossible.[2] (Note though that some postmodernists would shun consistency as a standard for judging [especially their own] schools of thought; see below.) She proceeds to outline four key elements of the soon-to-emerge synthesis, dealing in turn with its vision of reality, theory of knowledge, standards for scholarly judgment, and attitude toward methods. Each of these elements accords well, as we shall see, with interdisciplinary attitudes. She follows many authors in noting that modernist and postmodernist attitudes have battled under many other banners over the millennia since (at least) ancient Greek philosophy. In none of these other historical eras has synthesis proven permanent (2001, pp. 73-75). Hopefully, by articulating a coherent justification for interdisciplinarity the next age of synthesis can be extended, perhaps indefinitely.

The argument of this paper might be visualized as describing interdisciplinarity as occupying a point (or more accurately a range of points) between modernist and postmodernist extremes along a range of continua. This result is especially noteworthy given that modernism is constructed by postmodernists to represent everything that they disdain. Such a visualization is itself a modernist exercise, however: Postmodernists are often hostile to such dichotomies. They suggest that modernism and postmodernism often overlap. The arguments of this paper can be visualized in a manner much more congenial to postmodern sensibilities: Interdisciplinarians are urged to pursue a path of discovery that recognizes both the strengths and weaknesses of different epistemological and methodological attitudes. This path of discovery is wary of extreme *conclusions* but embraces discourse of all types. From an interdisciplinary perspective itself, the paper integrates modernist and postmodernist perspectives. Postmodern critiques of the scholarly enterprise are validated, but their limitations noted, while modernist aspirations are likewise appreciated while limits to these are acknowledged.

A paper such as this might leave the misleading impression that modernism and postmodernism (and interdisciplinarity) are the only contemporary intellectual currents of note. Not only are there different schools of thought within modernism and postmodernism, but interdisciplinarians are hardly alone in rejecting extreme versions of each. This paper will thus show from time to time that interdisciplinarity is complementary to (parts of) diverse intellectual traditions, including complexity, critical theory, critical thinking, discourse analysis, feminism, pragmatism, rhetoric, and social constructionism. All of these, notably, have taken certain postmodern critiques seriously (often long before postmodernism emerged), but have nevertheless identi-

fied paths toward enhanced understanding. The fact that scholars from these traditions are often cited does not, of course, imply that they share the interdisciplinary outlook across all issues.

The first set of issues to be addressed is broadly epistemological in nature. These set the stage for a discussion of the role of disciplines within the scholarly enterprise. The third set of issues is more practical in nature: What attitudes should be taken toward theory, method, and scholarly standards? Notably scholars of interdisciplinarity have focused the vast bulk of their attention on the second and third sets of issues: The epistemological assumptions of interdisciplinarity are often only implicit in the literature. Nevertheless, this paper will argue that epistemological attitudes compatible with interdisciplinarity can be identified readily.

I. Epistemological Issues

We begin with a discussion of the very possibility of enhanced scholarly understanding. The question of scholarly bias is then addressed, first in general terms, then in the context of social divisions such as gender and class, and then with reference to the possibility of "objectivity." Objectivity is only a meaningful concept if it is thought that there is an external reality: The question of whether there is indeed an external reality is engaged in general and then with reference to key questions about the nature of reality, causality, and time and space. The next issue discussed is whether any external reality would be too uncertain and complex to comprehend. Last but far from least, the vexed question of whether human language is too ambiguous to convey understanding is addressed.

1. Proof versus Relativism

Postmodernist Position: *Any argument is as good as another, for there are no objective standards by which to judge.* Affirmative postmodernists back away from extreme relativism and assert that human reason allows some basis for choosing; they tend, though, to accept only (perhaps multiple) local, personal or community truths (Rosenau, 1992, pp. 80-81, 173). All postmodernists may be accused of claiming objectivity for their own postmodern attitudes but dismissing the arguments of others as relative (Rosenau, p. 175).

Modernist Position: *Arguments can be proven correct—or at least disproven.* Philosophers of science now almost unanimously reject the possibility of

proof/disproof, for some "excuse" can always be found to reject the results of any scientific exercise. While some scholarly communities are blissfully unaware of this conclusion, it is nevertheless true that the modernist scholarly project as a whole has long since abandoned the pretence of truth or falsification. And in practice modernist scholars had certainly recognized that most/all of their conjectures were not proven (or their converse disproven) and thus might be overturned by later scholarship. Modern social scientists thus tend to accept that the world is complex and truth never fully attained, but that truth is still a goal worth striving for (Rosenau, 1992, p. 91). Mourad (1997, p. 128) less charitably notes that modernists who reject absolute knowledge must cling to the possibility of increased understanding; yet he later (p. 127) appreciates that postmodernists also explore alternatives to traditional concepts of knowledge given that absolute knowledge is impossible.

Interdisciplinary Position: *Proof, and even disproof, is impossible. Nevertheless, supporting argument and evidence can be compiled such that one statement is reasonably judged more credible than another (though interdisciplinarians can and do disagree about criteria for judging credibility; see below).* As argued above, interdisciplinarians would hardly pursue integration unless inspired by a belief that the resulting holistic perspective could be judged superior.[3] Of course, some postmodernists would say that different scholarly communities could, as a matter of taste, choose the standards they wished, but that no such standards had epistemological merit. Yet interdisciplinarians generally wish to be able to communicate the advantages and insights of their integrative approach back to the disciplinary communities from which they draw; they must thus aspire to universal standards.

The interdisciplinary position is thus complementary to the "rhetorical" outlook, which maintains that scholarship is an ongoing conversation, but a conversation that allows informed judgments to be made as new arguments and evidence are introduced. As McCloskey (2001, pp. 122-123) stresses, an ongoing conversation does not mean that there are not standards by which to judge (see below), and disdain of transcendental truths does not mean that scholars do not come to agree on some truths (see Szostak, 2003, chap. 2). Richard Rorty, the neo-pragmatist philosopher, has argued that since proof is impossible, there can be no theory of knowledge, and "truth" is nothing more than what some group agrees to. Scholars do not need a theory of absolute knowledge, but only some (imperfect) idea of how to (imperfectly) enhance understanding. Scholarly conversations differ in whether and how

rapidly they approach consensus, but all can be judged to progress if new arguments and evidence are amassed, and especially if these allow some possibilities to seem either very likely or very unlikely.[4]

Notably, McCloskey calls the rhetorical outlook postmodern, though she carefully distinguishes her arguments from the French philosophies commonly associated with the term. She notes that deconstruction is in many ways the latest outpouring of a millennia-old rhetorical sensibility: Deconstruction, by identifying multiple views within a text, allows individuals to realize that their "view" is a "view." The challenge, though, is to avoid taking an additional unnecessary step and believing that all views are equally valid. The interdisciplinarian, like the rhetorician, celebrates the existence of competing views but seeks to integrate these.

While one should not choose an epistemological outlook on political grounds, one should be aware of the political implications of such choices: This can at least encourage care in choosing. Derrida hoped that postmodernism made totalitarianism impossible, for totalitarian states rely on truth claims (Rosenau, 1992, p. 90). Yet Foucault in his later writings worried that extreme skepticism gave no answer to totalitarianism: If one argument is as good as another, one cannot argue that totalitarians are misguided. A middle ground thus offers the best defense against political extremism: One can argue that we should always have doubt—and thus repudiate the extreme truth claims of totalitarianism—while amassing argument and evidence of the costs of totalitarianism.

2. Scholarly Biases (Existence of Science)

Postmodernist Position: *Science/scholarship is necessarily riddled with biases and errors, and thus scholarly truth claims are not superior to other sorts of truth claims.* Foucault is famous for pointing out the role of power relationships in science: Scientists produce conclusions that support the exercise of power; in later works he backed away from claiming that this was inevitable. Cullenberg et al. (2001, p. 28) argue that attacking the privilege of science need not mean renouncing science but merely assuring that other voices are heard. Of course, if one holds to the belief (above) that any argument is as good as any other, then scientific discourse is no better or worse than any other.

Modernist Position: *The scientific method produces objective knowledge.* As noted above, modernists have had to revise this belief as they appreciated

that proof/disproof is impossible: The strength of various pieces of argument and evidence could nevertheless be objectively evaluated. This at least is how modernism has been characterized by postmodernists: In practice modernists often appreciated the fallibility of science and scientists but believed that scientific method(s) ensured that understanding generally progressed. McCloskey (2001, p. 103) notes that modernism as it played out in early 20th-century literature was very anti-science, but in architecture (and elsewhere) was pro-science; both strands of modernism nevertheless embraced truth, reason, and generalizability.[5]

Interdisciplinary Position: *Science/scholarship is neither perfect nor impossible. Particular types of argument and evidence are especially valuable in enhancing scholarly confidence in a particular conclusion; scholars may achieve consensus.* Again, integration is predicated on a belief that enhanced understanding is achievable, but any perspective partial and limiting. Richardson (2000, p. 928) claims, "The core of postmodernism is the doubt that any method or theory, discourse or genre, tradition or novelty, has a universal and general claim as the right or the privileged form of authoritative knowledge." Interdisciplinarians can reject the claim that any one theory or method provides the entire answer to any non-trivial question while also rejecting the conclusion that there is not a *set of* scientific practices (including notably practices associated with interdisciplinary analysis itself; see Repko, 2008) that is particularly good at enhancing understanding.

Interdisciplinarians celebrate the fact that integration exposes disciplinary biases (among other things). By juxtaposing what different disciplines say about a particular theme or question, *and* by investigating the different "disciplinary perspectives" involved, interdisciplinarians are able to see how a discipline's hidden preferences influence its conclusions. Postmodernists might counter that, while this task is laudable, it is doomed to fail because errors and biases are deeply rooted in the entire scientific project. In particular, it is not clear that interdisciplinarian(s) will necessarily uncover any biases or errors that might afflict all of the disciplines they engage. (Nor, more generally, will the peer review process catch errors rooted in widely shared but unrecognized biases.) One useful strategy is to attempt scholarly identification and dissemination of the *full range* of possible biases and errors. In this way at the very least scholars can be made aware of biases that had previously operated invisibly (and likely subconsciously). The interdisciplinarian can then ask whether each of these seems to have affected the analysis of a particular question. Szostak (2004, chap. 5) develops such a

list, drawing heavily on both critical thinking and postmodern scholarship. Postmodern critiques can be extremely valuable here, but the interdisciplinarian can apply particular postmodern insights without abandoning hope of enhanced understanding. In addition to strategies for minimizing bias, interdisciplinarians should also embrace humility "since no procedures can completely eliminate biases when they are widely shared" (Newell, 2002, p. 128).

The rhetorical approach was lauded above. It is important here to recognize, as rhetoricians do, that arguments can be compelling for a variety of reasons. The interdisciplinarian should strive for a conversation in which the winners are those statements with the most compelling argument and evidence. Notably, the critical theory associated with Habermas also stresses that scholarly inquiry is political- and interest- and value-laden (Alvesson, 2002, p. 3), but Habermas nevertheless argues that scholars engaged in an open honest conversation can aspire to increased understanding. The conditions that Habermas urges for constructive conversation—that participants share the goal of agreeing, that participants want to identify the best argument, that participants do not suppress any relevant argument (or participant), and that participants strive for shared meanings (see Cooke, 1998, p. 5)—are (ideally) characteristics of interdisciplinary research teams, and arguably interdisciplinarity more generally. Pragmatism provides yet another philosophical standpoint from which a scholar can use postmodern critiques in evaluating any piece of research but nevertheless aspire in so doing for "better" understandings (Alvesson, 2002, p. 15).[6]

3. Gender, Class, Ethnicity

Postmodernist Position: *Social divisions by gender, class, and ethnicity generate incommensurable perspectives.* Note though that some leading postmodernists—Foucault, Bourdieu, Greenblatt—have argued for convergence on issues of race, class, and gender.

Modernist Position: *Scholarship generates objective truths (at least ideally; as noted above modernists recognized that most/all scientific statements might be overturned).*

Interdisciplinary Position: *As with disciplines, it is possible to integrate across perspectives rooted in social divisions.* Recent scholarship (see Newell, 2001a) notes that integration across social divisions is similar in many

ways to integration across scholarly disciplines. Newell (2001a) recognizes though that social or cultural or ideological types of integration are often more controversial than disciplinary integration, because individuals often identify themselves in social/cultural/political terms. Interdisciplinarians are predisposed to be suspicious of claims of incommensurability (see below), for interdisciplinary practice depends on some (imperfect) ability to speak across any boundaries.

Feminist scholarship has identified a number of masculine biases in modernist scholarship. Yet most feminist scholars have stopped short of embracing postmodernism for the simple reason that they do not wish to have their insights dismissed as just another argument (see Einstadter & Henry, 1995). The interdisciplinary position allows scholars to strive toward integrating the insights of "masculine" and "feminist" scholarship. It was noted above that when integrating across disciplines interdisciplinarians hope to have something useful to communicate back to those disciplines. Here too it is notable that feminist scholarship for the most part attributes these different perspectives to socially constructed gender roles. They would thus see a value in exposing the hidden biases that may be at work.

Among the "masculine" values that have arguably permeated modernist scholarship are objectivity, self-interestedness, rationality, autonomy, formalism, and mathematization, as opposed to subjectivity, altruism, intuition, dependency, informalism, and verbalization (Nelson, 2001, p. 289). Nelson urges in each case that feminist scholars not choose the latter over the former but seek to combine the best of each. More formally, Rosetti (2001, p. 312) argues that feminist scholarship does and should proceed by identifying such dualisms (a strategy at the core of deconstruction),[7] show that both elements of each dual are needed, show how incorporating (integrating across) these two perspectives changes scholarly understanding, and thus how received understandings reflect subjective biases and power relationships. Notably, each of these distinctions will be addressed below, and in each case integration will be urged.

As was recognized above, interdisciplinarians seek to expose disciplinary and other biases. Nelson (2001, p. 294) argues that the best path to an "objective" science is an ongoing conversation that involves people with differing perspectives, including perspectives rooted in gender, class, and ethnicity. As with gender, she argues that the best approach to race/ethnicity is to embrace both multiculturalism and our common humanity, and seek to integrate across ethnic/cultural divides. More generally, she argues that there is good in both "universalizing modernism" and "fragmentary post-

modernism," and that scholars should recognize differences but generalize when possible (2001, pp. 300-302). The ability to generalize across groups may be essential to the feminist project, for this has been critiqued in recent decades for ignoring huge differences in outlook among women due to differences in class and ethnicity: Feminists can only usefully engage with the fact that women in some societies appear to embrace gender inequities of various sorts by seeking to understand the sources of these beliefs (Charusheela, 2001).

One way in which various biases can be combated is to assemble research teams that bring together multiple perspectives (though it will then be necessary to assure that these different perspectives are heard: One danger is that some voices may be privileged by either cultural stereotypes or official team hierarchies). Yet there is arguably still a place for individual interdisciplinary researchers. These should be sensitive to bias. More centrally, they should recognize that they are part of an ongoing conversation, and be sensitive to the comments of others. Potentially, biases can be identified by a process of comparing the work produced by researchers from different backgrounds.

The scholar of interdisciplinarity Julie Thompson Klein has recently (2004, p. 517) identified a "postnormal science" characterized by community input, recognition that certainty is impossible, and transcendence of (modernist) reductionist and mechanistic assumptions. She draws in turn on the work of the European transdisciplinarians[8] Gibbons et al. (1994) who identified a new mode of scholarly research organized around problems rather than disciplines, centered outside universities, and responsive to societal needs and evaluation. The association of interdisciplinarity with community involvement has proceeded much farther in Europe than in North America but is evident in both locales.

4. Self-reflexivity (Objectivity)

Postmodernist Position: *Scholars should reflect on their biases and those of the scholarly community of which they are a part.* Note though that postmodernists often also reject the very idea of a unified coherent author of a work: This is one reason that they focus on language and symbols rather than individual biases (Rosenau, 1992, p. 42).

Modernist Position: *Scientists have access to a uniquely objective method(s).* Mourad (1997) claims that this was a key tenet of modernist thinking.[9]

Interdisciplinary Position: *This position is identical to the postmodern position as stated here, but without the pessimism of the very possibility of "objective" scholarly understanding often associated with it.* The recognition that scholarly communities, and the scholars embedded in them, provide incomplete and biased perspectives lies at the very core of interdisciplinary thought. Interdisciplinarians strive to overcome these biases in developing a more holistic perspective. In doing so, interdisciplinarians need to reflect on their own possible biases and errors. This indeed is one of the steps in the process of interdisciplinary research outlined in Szostak (2002), in Newell's (2007) discussion of interdisciplinary decision-making, and in Repko (2008). It is also identified by Gibbons et al. (1994) as a natural component of transdisciplinarity: One cannot challenge existing scientific practices without reflecting on one's own.

It would be hard to exaggerate the importance of this attitude. Szostak (2004, chap. 5) outlines a lengthy set of possible biases and errors in scholarly research. Postmodernists argue (among other things) that these are so overwhelming as to make claims of an objective scholarly project laughable. To resurrect a claim that scholars can at least strive toward objectivity, it is necessary to first recognize these possible biases, and then identify means to combat each of them. "Since any perspective is known to be a reflection of values, it must be explicitly acknowledged" (Rosetti, 2001, p. 323). Interdisciplinarians have thus always emphasized the need to grapple with "disciplinary perspectives" (but perhaps not always the need to reflect upon the interdisciplinary perspective), though scholars of interdisciplinarity have not yet agreed on what the key elements of these might be. As noted above, a complementary approach is to develop a list of all potential biases and errors, and work to identify and overcome these.

Can these biases and errors be overcome enough that one can speak of a reasonably objective (but not perfectly so) scholarly enterprise? The fact that scholarly understanding appears to have advanced in some fields (such that we are able to do useful things like fly) suggests that the answer is at least sometimes yes. But interdisciplinarians can recognize that this is a question that requires human judgment. Perhaps in at least some cases— including "how/why does art move us?"—there are severe limits to how objective human understanding can ever be. Ironically, then, the salvation of objectivity (as a goal to be strived for but never perfectly achieved) lies through reflecting on subjective biases. As noted above, this can only be done within an ongoing conversation, for each of us is likely better at spotting the biases of others.

5. External Reality

Postmodernist Position: *There are multiple realities constructed by individuals.* Mourad (1997, p. 116) places this conjecture at the core of postmodernism: "[O]pening up room for the intellect to pursue important ideas outside the notion that reality is composed of things to know." Postmodern epistemological concerns (above) flow from the denial of reality: If there is no reality then of course humans cannot know it. "Knowledge" must then be socially constructed. Postmodern thoughts on theory (below) are also tied to postmodern conceptions of reality: Multiple realities call forth multiple theories.

Modernist Position: *There is an external reality "out there" that scholars gradually comprehend.*

Interdisciplinary Position: *There is an external reality, though humans are limited in their abilities to accurately and precisely perceive this.* It has been claimed above that interdisciplinarians must believe in the possibility of enhanced understanding. It follows that this must be an understanding of something "out there." To be sure, interdisciplinarians must often grapple with the meanings (realities) that individuals or groups create, and might from time to time focus upon these. But interdisciplinarians more generally ask questions about how the world actually works, and must thus believe that there is some reality to describe. In recognizing the limits of disciplinary (and other) perspectives, interdisciplinarians open the door to recognition that all perspectives combined may still be limited. This insight accords with scholarly understanding of limits to human perception, cognition, and communication. Newell (2001b, p. 141) captures this sentiment:

> But I am increasingly frustrated by either/or ontological thinking that presumes we either have full, direct access to reality or no knowledge of reality at all. As interdisciplinarians, we need to get past such dichotomies. My presumption is that we perceive reality indirectly and thus imperfectly, "through a glass darkly." While we cannot describe a portion of reality with certainty, we can tell when we get too far off in our understanding, because the spacecraft doesn't land on the moon (i.e., the solution doesn't work).

Nelson (2001, p. 294) identifies two conditions necessary (though perhaps

not sufficient) for a reasonably reliable and objective scholarly enterprise. The first, as noted above, is a scholarly community engaged in open honest conversation—the interdisciplinarian would leap to add here that objectivity and reliability are *much* more likely when conversation involves multiple communities. The second is the existence of an external world to which scholarly theories must be responsive. Quite simply, if external reality is rejected, there is no possible standard by which the reliability and objectivity of a theory can be judged, for there is no truth that the theory might be striving to describe.

The postmodern critique of reality rests on the simple observation that people often disagree about reality. Yet people often agree as well: that the Earth is round, elephants big, and disease bad. Naturally humans spend less time talking about the myriad aspects of reality that are agreed upon than those they disagree about. When people disagree, it is often because they misunderstand each other (see below). Or they may focus upon different facets of one reality: Observing the same mountain from different sides will yield multiple descriptions that can be integrated into one realistic description. When people understand each other and talk about the same thing but still disagree, this generally reflects the fact that *some aspects* of reality are hard to perceive. While disagreement might stem from multiple realities, it can easily be understood in terms of one reality (Detmer, 2003, pp. 68-71).[10]

Constructionist perspectives argue that "reality" is to at least some extent constructed cognitively either by individuals or—in social constructionism—interactively. Interdisciplinarians can readily approve key tenets of constructionist thought: that the understandings that individuals or groups (including experts) have of the world should not be taken for granted, that in particular the mere fact that different people perceive a similar reality need not mean that their shared perception is accurate, and that human understanding is an evolutionary process. (Note that skeptical postmodernists reject the idea that understanding cumulates.) Interdisciplinarians seeking to enhance human understanding of reality will necessarily part company from strong social constructionists who deny the existence of an external reality. However, moderate or contextual constructionists argue that positivism, with its belief in reality, "and constructionism are separate, equal, and complementary" (Henry, 2006). That is, these approaches can be integrated to reflect the fact that human perceptions of reality are to some extent constructed and to some extent constrained by external reality. Notably in this regard, constructionism not only posits different theories of reality from positivism but also encourages the use of interpretivist methods to investigate these (see below).

Nicolescu (2001) argues that there are different levels of reality: Atoms operate at a different level from organisms. If so, another possible source of disagreement about the nature of reality arises when different people see different levels of reality. Nicolescu suggests that these different levels need to be approached in different ways. He suggests that transdisciplinarians need to respect the integrity of different levels of reality, and also examine how these relate to each other. These multiple levels are nevertheless part of one reality.

Interdisciplinary research and teaching are most often centered on some complex social concern. If an external reality is rejected, how can one hope to make the world a better place? Rosenau suggests that the denial of reality is a middle class conceit: Those facing lives filled with crime and poverty would never pretend that they were not constrained by a reality not of their construction (1992, p. 111). Mourad (p. 126) notes that higher education has long been based on the belief in a reality that exists independent of its pursuit, and that scholarship in the academy has been valued by many only because it is thought to produce objective knowledge; if the postmodern position is accepted, the structure and purpose of higher education need to be rethought.[11]

5a. Closed versus Open Systems

Postmodernist Position: *There are no regularities in (at least) the human world for scholars to identify.* Note that such a claim might be considered inconsistent with the view that there are multiple constructed realities. There may be few scholars who hold this view.

Modernist Position: *The world is characterized by numerous "closed systems"—systems of phenomena not causally linked to other phenomena— and thus lends itself to the identification of "laws": regularities that always hold.*

Interdisciplinary Position: *The world is characterized by open systems. Nevertheless, it is possible to identify regularities, though (generally) not laws.* Disciplines often presume (though usually implicitly) that the set of phenomena they study can be analyzed in isolation. One key characteristic of interdisciplinary research is that it draws connections across such sets of phenomena.

The three positions outlined here were described in Dow (2001, pp. 62-

64), though she identifies the third option as "synthetic" rather than "interdisciplinary." Interdisciplinarians must reject the postmodern contention that it is simply impossible to identify regularities, for this severely limits the possibility of understanding. Yet interdisciplinarians must also be suspicious of any scholarly claim that any system of phenomena can be studied in isolation. Note that even (almost all) laws of physics are context-dependent: Newtonian mechanics is now understood as an important special case within relativity theory. Chemical reactions occur under precisely defined pressures and temperatures. Likewise in human science one can identify regularities—the price of coffee rises when coffee beans freeze on the vine—while noting that these may be affected by other phenomena: say, a change in tastes. The task of interdisciplinarians, as shall be seen below, is to understand individual causal links and how these interact. Along a particular link, scholars strive to define regularities, and also the realizations of other phenomena that might affect these regularities (see Szostak, 2003).

5b. Causality, Determinism, and Distinct Phenomena

Postmodernist Position: *Everything in the world is interconnected with everything else, and thus it is not possible to establish causality, or even perhaps to identify distinct phenomena. Postmodernists worry that embracing causality implies embracing determinism.* Note again that this position might be thought inconsistent with the idea of multiple constructed realities. Affirmative postmodernists are willing to accept some forms of causation, but stress the difficulties of establishing causal regularities in a complex world (Rosenau, 1992, pp. 112-113).

Modernist Position: *Standard scholarly practice is to isolate particular (small) sets of phenomena and seek regularities both theoretically and empirically.*

Interdisciplinary Position: *Interdisciplinarians recognize that most/all phenomena are causally connected with most/all others. They nevertheless believe that it is possible to identify (albeit imperfectly) distinct phenomena and causal regularities, though the latter will likely be influenced by realizations of many other phenomena. Causality does not threaten human free will.* As discussed above, a key tenet of interdisciplinary analysis is that disciplines ignore linkages to phenomena outside their purview. In other words, the scholarly enterprise should embrace a much broader set of link-

ages than most disciplinary researchers imagine. Yet interdisciplinarians strive to understand this complex reality, and must thus strive toward causal explanations. Interdisciplinarians appreciate that complex questions call for the understanding of multiple causal linkages, and recognize that feedbacks, emergent properties, and multiple causation are likely complications.[12] They nevertheless pursue enhanced understanding.

Disciplinary researchers often imagine that the phenomena they study have primary causal importance. And grand theories in human science often commit the same transgression: Recent Marxist scholarship, for example, strives to overcome the technological/economic determinism associated with Marx. In arguing that all phenomena are causally connected, and appreciating that such causation generally moves in both directions, interdisciplinarians argue against any prime mover. Technology has crucial influences on human lives, but the course of technological innovation is itself influenced by a host of cultural, social, and psychological phenomena (see Cross & Szostak, 2004). Lately, many scholars have emphasized the influences of "culture" on human lives; Szostak (2003) showed both that culture can be defined in terms of a variety of well-defined attitudes and practices, and that these are each influenced by, as well as influencing, diverse non-cultural phenomena.

Does causality imply determinism, and thus the loss of human free will? Rejecting determinism does not require that scholars reject causality but only that scholars embrace choice, indeterminacy, and multiple causation (Cullenberg et al., 2001, pp. 30-31). If scholars were to fully identify all causal regularities, and these fully explained all events and processes in the world, one might think that human free will would disappear in the sense that scholars could predict how each individual would act in each situation. Scholars will, of course, never achieve such a degree of certainty. Scholarly explanations will often be incomplete and/or contain stochastic elements. Moreover, when individual actors are involved, scholarly theories will not describe how "Joe" will act, but how various personality dimensions and schemas (beliefs about the world and ourselves) will influence how an individual will act. Individuals have the capacity to grow as human beings, altering their personalities and especially their schemas. Familiarity with causal arguments might thus allow individuals to exercise free will better (more often) than if they only act out of habit.

5c. Time and Space

Postmodernist Position: *Postmodernists are skeptical of linear time and*

three-dimensional space. Derrida has thus argued that causes (if such exist) may come after effects (Rosenau, 1992, pp. 72-76).

Modernist Position: *Linear time and (generally) three-dimensional space is assumed.*

Interdisciplinary Position: *Interdisciplinarians believe in a reality of which linear time and three-dimensional space are reasonably accurate descriptors. (They need, though, to recognize that different disciplines emphasize different time frames and levels of geographic analysis.)* To do otherwise would force interdisciplinarians to reject most of the disciplinary research they seek to integrate. Moreover, beyond some speculations in physics regarding multiple dimensions, there is little reason to reject common conceptions of time and space.

6. Uncertainty and Complexity

Postmodernist Position: *The world is so complex and uncertain that scientific understanding is impossible.* Notably, postmodern skepticism (and guarded interdisciplinary optimism, for that matter) with respect to the possibility of human understanding does not require any particular attitude toward the nature of the world—except that it is easier to imagine that scholarly biases will dominate if one thinks that the world is difficult to understand. Since postmodernists tend to deny the existence of a unique external reality, some could claim that an argument that the world is complex and uncertain is inconsistent with such a belief: If external reality is either nonexistent or unknowable, then no one is in a privileged position to make assertions about its complexity and uncertainty. However, uncertainty is arguably a key element of the postmodern condition (see below), and the postmodern condition in turn reflects in both art and science (for example, quantum physics) a recognition of how complex the world is (Cullenberg et al., 2001, pp. 8-15).

Modernist Position: *Complexity and uncertainty are downplayed.* In many social science disciplines, modernism meant structuralism: the belief in well-defined and stable subsystems of phenomena (Rosetti, 2001). There are important exceptions: Dewey and Wittgenstein both recognized that other scholars often presumed an unjustified certainty and sought means of coping with uncertainty (Schiralli, 1999, pp. 46-47).

Interdisciplinary Position: *The world is indeed complex and uncertain, but imperfect scholarly understanding is nevertheless possible.* Newell (2001) argued that interdisciplinarity is naturally concerned with complexity. While various commentators in that volume were skeptical that complexity is *essential* to interdisciplinarity, they tended to agree that integration is generally more valuable for complex questions or problems. *Some* simple questions can likely be handled within the confines of one discipline. But integration's greatest contribution likely lies in dealing with questions that are multifaceted, for different disciplines (and other perspectives) tend to shed more light on some facets than others. Thus some guarded optimism with respect to scholarly ability to cope with complexity and uncertainty is a likely interdisciplinary attitude.

Is such an attitude justifiable? As noted above postmodernists and interdisciplinarians (and modernists in practice) recognize that human understanding of even narrow questions is never perfect. If scholars examine a complex system with a large number of interactions among phenomena, and understanding of any one of these causal links between phenomena is necessarily imperfect, then one can reasonably doubt that scholarly understanding of the system as a whole will ever be very good at all. Certainly one can be skeptical of our ability to predict how the system will evolve through time. And thus scholarship can never erase substantial uncertainty about humanity's future.

I would argue that there is only one compelling answer to this challenge. In addition to studying the feedbacks and emergent properties inherent in a complex system (see below), interdisciplinarians should focus much of their effort on comprehending individual causal links. The two activities should be seen as complementary: Understanding the whole depends on understanding the parts, but likewise the parts can only be understood as part of the whole. Interdisciplinarians will naturally emphasize links between phenomena studied by different disciplines (a point emphasized by Newell, 2007) and links that are studied by more than one discipline (or non-disciplinary perspective). Even with respect to links studied by only one discipline, interdisciplinarians should usefully ask whether the analysis is biased by disciplinary perspective and can be enhanced by insights from other disciplines. With respect to individual causal links interdisciplinarians may be able to establish over time a fair degree of scholarly consensus regarding both the direction and size of likely effects of changes in one phenomenon on realizations of another. Where these effects seem unpredictable, scholars can strive to identify as much as possible the realizations of other phenom-

ena that influence these outcomes. Feedback effects, multiple causation, and emergent properties can be of particular importance here (but my personal sense is that we should be wary of assuming them at the outset).

While such an approach has been most carefully elucidated in Szostak (2003), it follows from a recognition that different perspectives have more to say about some links than others: Integration must necessarily involve looking at different facets of the larger question in turn (but iteratively, so that the effects of all relevant phenomena on all other relevant phenomena are captured). Such an approach is also consistent with the pragmatic philosophy of Dewey: Dewey noted that in representing any process scholars naturally abstract from the broader context but that humanity has nevertheless gained important insights by "identifying discrete 'elements' of experience and seeking to establish 'causal' links among these" (Schiralli, 1999, p. 52). The goal, though, is to understand the complex network of interrelations among some set of phenomena.[13]

Postmodernism is closely associated with poststructuralism, though scholars debate the precise relationship (see Alvesson, 2002, pp. 30-31). As the name implies, poststructuralists are suspicious of the "structures" of interrelated phenomena posited by structuralists. By embracing the study of individual links, including links to phenomena outside a particular "structure," and recognizing that systems of phenomena evolve in unpredictable ways, interdisciplinarians embrace a key element of poststructuralist thought. They do so, however, by rejecting extreme versions of poststructuralism that challenge "the very idea of structure, including the idea of a centre, a fixed principle, a hierarchy of meaning and a solid foundation" (Sarup, 1988, p. 49).[14]

7. Ambiguity of Language

Postmodernist Position: *Postmodernists note that words (and other symbols) do not perfectly represent that which they refer to: There is always a difference between the "signified" and "signifier."* While philosophers have long noted the ambiguity of language, the novelty of postmodernism is that it takes these concerns to an extreme that would deny the very possibility of scholarly understanding (Alvesson, 2002, p. 54). Postmodernists note that representation implies selection (of the aspects judged most important), but selection necessitates omission, and omission means misrepresentation (Schiralli, 1999, p. 1). Lemon (2003) suggests that anti-representationalism is the cornerstone of postmodernist thought; postmodernists may disagree

on much else but not this. Derrida argued that since language cannot provide a neutral description of reality scholars need to investigate language itself, but can only do so through language: There is thus an infinite regress. Other postmodernists tie problems with language to the non-existence of reality: If neither objects nor ideas have universally true characteristics, then language must be arbitrary (Rosetti, 2001).

Modernist Position: *While many scholars are aware that language is inherently ambiguous, it is felt that precise scholarly conversation is possible. In particular, research reports are written as if this were the case.* Few if any scholars today could be accused of believing that words are perfect representations of reality, and thus the modernist position is not defined here in terms of such a belief, but rather an observation of common academic practice.

Interdisciplinary Position: *Language is ambiguous, but ambiguity can be lessened. Integration is a powerful means of doing so.* Interdisciplinarians are particularly aware that the same concept can have different meanings in different scholarly communities. A key step in the integrative processes recommended by Klein (1990) or Newell (2001) or Szostak (2002) or Repko (2008) is to investigate these different meanings and strive toward common understandings.

Affirmative postmodernists recognize problems with language but hold that some consensus on concepts is still possible (Rosenau, 1992, pp. 80-81). Yet a decade later Alvesson (2002, p. 65) can opine that postmodernists as a whole have spent little time worrying about ways to decrease the problems of language; they have rather tended toward extreme pessimism or engaged in a joyous celebration of style over substance. Fortunately, some scholars outside the postmodern tradition, such as discourse analysts, have done so. One important observation is that language is more ambiguous in some cases than others. Alvesson (p. 80) suggests that when looking at statements such as "The Nazis murdered millions of Jews" or "Use of condoms limits the spread of sexually transmitted diseases such as AIDS," there is little advantage to worrying about the smallish differences between signified and signifier (and, one might add, huge costs if so doing causes such statements to be dismissed). On the other hand, a statement that managerial charisma encourages worker satisfaction is much more tenuous because various words in the statement have non-obvious connections with any signified. One clear strategy to overcome postmodern concerns, then, is to strive for

statements involving close correspondence between signifier and signified. This is clearly not the case with many concepts often used in (at least) human science: Words such as "globalization," "patriarchy," or "culture" have multiple and often vague definitions, and thus any causal argument stated in these terms is *necessarily* ambiguous. Yet scholars can so easily do better. Szostak (2003) not only provided a precise definition of "culture" in terms of hundreds of constituent attitudes and behaviors, but showed that scholarly analysis is best undertaken in terms of one or more of these than at the vague level of culture. In postmodern terminology, the gap between signifier and signified is vast with respect to "culture" but arguably unimportant with respect to "attitude toward punctuality." Szostak (2004) argued that both patriarchy and globalization are unclear combinations of various institutions and attitudes: Scholars need to identify these constituent parts and understand their interrelationships and how they are causally related to other phenomena if they wish to act to decrease their ill effects. Scholars can choose to perform research in terms of carefully defined concepts (for the most part grounded in one or more phenomena, though there will also be theoretical and methodological concepts), and thus *greatly* decrease the ambiguity of language. If specialized scholars would do so, the task of interdisciplinary scholars would be much easier. In turn, then, it behooves interdisciplinarians to advocate the use of precise concepts, and thus work toward a common scholarly vocabulary.[15]

Even when there may appear to be a close relationship between signifier and signified, one must still worry that the signifier suppresses divergence and variety. One can be confident for the most part that one knows what "woman" means: This can be defined in terms of (generally) clear biological differences from "man." Yet often the words "woman" and "man" are used in contexts where these biological differences are not obviously important, and thus imply that there are important sociocultural differences being posited that need to be made explicit. (Note here that postmodern critiques tend to focus on the ambiguity of sentences; Habermas has argued that at the level of longer "utterances" ambiguity is much less because one can then draw upon conventions in which communication is embedded; Cooke, 1998, p. 6.) As was noted above, feminists are increasingly aware that the experiences of women vary across class, ethnic, and other lines. Likewise, it is clear that some women occupy traditionally male occupations or exhibit personality traits long associated with men. Researchers need to be careful that in using gender descriptors they do not implicitly assume homogeneity (see Alvesson, 2002, chap. 5). Yet with these caveats in mind, the cat-

egory of "woman" or "man" can be extremely useful. The diverse influences of cultural attitudes and institutional structures can be explored as causal links between these and gender roles. The different experiences of different women can be comprehended in terms of links between gender roles and ethnicity, class, or personality. A focus on links requires researchers to be explicit about which aspect of gender they investigate and what precise arguments they proffer. Importantly, one possible outcome of such research is to identify circumstances in which gender does not matter at all: Research does thus not start from a presumption that gender is an inherently central category for analysis. The overall structure of causal links allows this vast range of different influences to be organized coherently.

A variety of other strategies are available to mitigate problems of ambiguity. One strategy for identifying the hidden meanings attached to words is to investigate how the use of a particular word has evolved over time. Scholars of all sorts need to appreciate that language is better at communicating specific information (say about a particular event) than in communicating the meaning that people attach to situations or their behavioral dispositions. Ironically, one can draw a conclusion here that one should therefore not rely exclusively on textual analysis in such cases but use experiments and observation as well: ironic because postmodernists, though they dispute the authority of language, tend to analyze texts exclusively (though there has been increased attention recently to visuality, orality, and aurality). Scholars of all sorts need to appreciate that people always have a purpose (though it may be subconscious) for utterances, and thus one should be careful of taking utterances at face value. This, of course, is a fact of life that historians in particular have grappled with for centuries, and historians have long been trained to combat this problem by striving to place utterances in context and ask why they were uttered. Again, some postmodernists speak against such a strategy: Since texts are not representations of their context they should be studied on their own (while others emphasize intertextuality and argue that texts can only be understood in the context of other texts; they still often oppose reference to anything outside texts). Still other strategies could be listed. The point to emphasize here is that many scholars are guilty of not taking concerns regarding the ambiguity of language to heart, and that problems with language should be given prominence among the list of biases and errors that interdisciplinarians consider when evaluating specialized research; yet ambiguity need not be so severe as to render understanding impossible.

If skeptical postmodernists really believed that language is completely ambiguous, they would not bother saying so at such length, for they could have

no expectation of being understood (Rosenau, 1992, p. 178). Perhaps as a result postmodernists tend to use particularly obscure language. Interdisciplinarians can embrace the possibility that some aspects of reality are hard to describe ("why does art move us?"), and may thus lend themselves to a poetic treatment. But interdisciplinarians (and indeed all scholars) should still demand that authors describe broadly the point they strive to make in some simple clear sentences. And interdisciplinarians should also oppose unnecessary jargon, especially in their own work (where it not only limits unnecessarily their audience but "bootlegs" the disciplinary perspective embedded in the jargon into the analysis; Newell, 2007), and insist that any jargon used be carefully defined someplace in terms of words with an obvious signified.[16]

Deconstructionists celebrate the fact that texts are generally inconsistent: The author makes statements in different places that are contradictory. Rather than evidence of language ambiguity, this may instead be evidence that the author is concentrating upon different facets of an issue or theme at different points in the text (Alvesson, pp. 78-79). As noted above, interdisciplinarians are well aware that complex problems need to be broken into constituent parts, and that different lines of argument will be more applicable to some of these than others. Interdisciplinarians can thus view inconsistent texts as a steppingstone to an integrated view (and one that the authors of such texts may even value for clarifying their thoughts), rather than an invitation to despair.

Texts contain key messages and subsidiary messages. Texts may differ in terms of which of these—the main or subsidiary—are most ambiguous. This in turn may reflect whether the author is pursuing analysis at a suitable level. If the author's main thesis concerns a vague broad phenomenon such as "culture," it could be that supporting arguments will be much clearer than the main thrust. Interdisciplinarians need to evaluate both main and supporting argumentation.

We have focused so far on words. Yet, as Cullenberg et al. (2001, p. 24) note, concerns about representation apply at least as strongly to mathematical symbols. Scholars who develop mathematical models or perform statistical analysis are generally guilty of not carefully evaluating how closely the terms in their equations relate to what these are supposed to signify. The postmodern critique of representation provides yet another motive for embracing both quantitative and qualitative forms of research (see below).

7a. Incommensurability

Postmodernist Position: *The language used by any community can only be*

fully comprehended from within that community. This position flows to some extent from concerns about representation: If representation is impossible, then comparison of any sort is impossible (Rosenau, 1992, pp. 171-172). Interestingly, while ideas of incommensurability at least imply that disciplines are internally consistent, many postmodernists suggest that internal consistency is not a necessary or desirable characteristic of a scholarly conversation.

Modernist Position: *Presumably the opposite, though it is particularly notable in this case that this idea was popularized by Thomas Kuhn long before (epistemological) postmodernism emerged.*

Interdisciplinary Position: *Different communities are characterized by overarching perspectives that influence what is said and thought. While barriers to communication exist, these are surmountable to a considerable extent.* Obviously, interdisciplinarity would fail as an enterprise if it were completely impossible for a scholar from one community to comprehend even slightly what was said within another. Note that in addition to its clear implication that interdisciplinarity is impossible, the skeptical postmodern position suggests that cross-cultural understanding is also impossible.[17]

Lyotard argued that an axiomatic system of knowledge depends on assumptions that cannot themselves be demonstrated. Sciences are thus a plurality of incommensurable and discrete truths (in Mourad, 1997, p. 121). Yet Rorty has argued that "the failure to find a grand narrative that may serve as a universal translation manual does not need to obstruct the possibility of making peaceful social progress, within and outside science" (in Alvesson, 2001, p. 41). One can (and should) interrogate the assumptions underlying any scholarly claim. If the assumptions underlying different claims are inconsistent, which assumption is more believable? Alternatively, is there some way of clarifying these assumptions (perhaps by making them less general in application) such that they are no longer inconsistent? Such questions lie at the heart of interdisciplinary analysis.

7b. Authorial Authority

Postmodernist Position: *Since texts are inherently ambiguous, the authority of the author is questioned, and readers are given virtually unlimited scope to interpret the text.*[18]

Modernist Position: *Texts are created by authors. As noted above, autho-*

rial biases and errors have tended to be downplayed, though not entirely ignored.

Interdisciplinary Position: *Texts are created within communities of scholars, and thus scholars reflect a perspective of which they are likely imperfectly aware. Nevertheless, texts reflect the views of this situated agent.* There is nothing to integrate if scholars deny that texts carry key messages intended by the author. This does not prevent the interdisciplinarian from identifying inconsistencies—we saw above that this is a useful strategy—but does require a belief that not every possible interpretation is plausible.

Deconstruction "has little or nothing to say on its own but relies on others to say something that the [postmodernist] then can get his or her teeth into" (Alvesson, 2002, p. 28). Not surprisingly, scholars that doubt authorial authority are wary of making any constructive claims but rather keep themselves busy finding inconsistencies in the works of others. While the latter can be a valuable task, a scholarly community as a whole that only did so is hard to imagine (and it is even harder to imagine the taxpayer funding it). Affirmative postmodernists (and feminist scholars) thus use deconstruction not just to critique existing bodies of understanding but to point the way toward new and less-biased understandings (Einstadter & Henry, 1995, chap. 12). To retain a hope that scholarly understanding can enhance human well-being it is necessary to accept the possibility that an author can make a clear enough argument for others to build on. They can thus join Schiralli in suggesting that deconstructionists can be as dogmatic as those they critique, while also urging the use of both deconstruction and other methods for "making more and better sense of texts" (1999, p. 77).

II. The Shape of the Scholarly Enterprise

Having addressed a range of broad epistemological issues, we can turn our attention to the appropriate role for disciplines. We then ask whether it is possible and/or desirable to pursue the unity of science.

8. Disciplines

Postmodernist Position: *Postmodern inquiry should be self-organizing and not limited by disciplinary boundaries.* "[Postmodernists] want to get rid of disciplinary boundaries" (Alvesson, 2002, p. 14). "Post-modernists question any possibility of rigid disciplinary boundaries," and thus postmodernism has a "radically interdisciplinary character" (Rosenau, 1992, p. 6). If dis-

ciplines did exist in a postmodern academy, these would be "networks of inquiries" rather than communities organized around theories or methods (Mourad, 1997, p. 132). While (many, at least) postmodernists thus applaud "interdisciplinarity," we shall see that they thus mean a quite different practice from that advocated by interdisciplinary scholars.

Modernist Position: *Disciplines are logical entities reflective of external reality.* Disciplines are viewed as the natural repositories of knowledge (Mourad, 1997, pp. 129-131).

Interdisciplinary Position: *Disciplines are the result of an evolutionary process, but at any time represent a mutually supportive constellation of theory(ies), method(s), phenomena, disciplinary perspective, and rules of the game.* Such a definition of disciplines can be found in the works of many interdisciplinarians (see Klein, 1990 and 2005, Salter & Hearn, 1996, Szostak, 2003a). Interdisciplinarians can and do disagree with respect to how logical the present disciplinary structure is. That is, some lean toward a modernist confidence that disciplines represent to an important degree a logical division of the scholarly enterprise, and are thus organized around coherent themes "out there" which lend themselves to the application of certain theories and methods. Others tend toward a postmodern skepticism that disciplines may reflect the professional interests of those within rather than a coherent attempt to grapple with reality; methods might thus be chosen that validate favored theories. These conflicting attitudes influence beliefs regarding whether there is a place for disciplines in an ideal interdisciplinary academy.

Szostak (2004) eschewed the word "discipline" as much as possible. Instead, the simple point was repeatedly made that the scholarly enterprise needs both "specialized" and "integrative" research. There are huge advantages to a group of scholars collectively investigating a particular issue or theme, and grounding their inquiry in some shared understandings. But there are huge disadvantages too, for these shared understandings are likely to be misguided in some respects. I argued, like Mourad, that specialized researchers will naturally focus on a particular set of phenomena, but should strive to be open to multiple theories and methods. Nevertheless interdisciplinary scholars will likely be able to provide advice on theories and methods overlooked, as well as on causal links worthy of note and biases or errors unnoticed. I dodged (there and here) the question of whether groups of specialized scholars need to be institutionalized in something as formal as

disciplines, but certainly stressed that they should be much more open than are present disciplines to multiple theories and methods, links to phenomena studied by other (or perhaps no) scholars, self-reflexivity, and interdisciplinary insights more generally. In Szostak (2003) I speculated on a disciplinary structure where disciplines were organized around key categories of phenomena, and noted that human science disciplines as presently constructed deviate considerably from such a logical structure.

Interdisciplinarity is trendy these days. Yet the vast majority of scholarly research is highly specialized,[19] even in the most eclectic social sciences (Alvesson, 2002, p. 24). Interdisciplinarians can and should carefully articulate a vision of interdisciplinarity that maintains a place for this specialized research. This may overcome the fears of specialized researchers that interdisciplinarity would mean the end of life as they know it. While integrative research would not be mandatory, interdisciplinarians should nevertheless seek to educate specialized researchers on the advantages of (and means to) exploring a wider range of theory, method, and phenomena, and reflecting on possible biases and errors. Notably, calls for educational reform within many disciplines also urge these types of breadth.

In pursuing this public relations initiative interdisciplinarians need to distinguish themselves carefully from postmodernists as well as modernists. Mourad (1997, p. 132) argues that cross-disciplinary inquiry should reflect a desire to transcend the idea of a pre-existent and independent reality and pursue other forms of knowledge: He criticizes interdisciplinarians for not critiquing the disciplinary pursuit of knowledge of reality. Interdisciplinarians can and should critique disciplinary practices without critiquing the knowability of reality itself. Mourad then (pp. 133-136) argues that interdisciplinarians should not integrate but seek only to develop new conceptions of reality (and thus embrace fragmentation of knowledge rather than integration). However, if one accepts that there is a coherent external reality, then integration becomes a desirable pursuit. Finally Mourad (p. 136) criticizes interdisciplinarians for seeking unified knowledge rather than rejecting absolute knowledge. Yet, as seen above, it is both plausible and desirable to recognize that proof/disproof is impossible but to nevertheless pursue advances in understanding via integration.

Rosenau (1992, p. 180) speculates on a possible future in which all disciplines are divided into modernist and postmodernist sub-disciplines that generally do not speak to each other. She suggests instead a future in which modernism and postmodernism are integrated by abandoning the most extreme claims on either side.

9. Unity of Science (Meta-narratives)

Postmodernist Position: *The scholarly enterprise is a congeries of incommensurable conversations. In particular, postmodernists favor localized analyses and are suspicious of "meta-narratives."* Mourad (1997, p. 121), following Jacques Lyotard, thus argues that scholars cannot pursue unified knowledge but should only create new language games.

Modernist Position: *Consistency across the understandings of different scholarly communities is sought, and assumed possible. Grand theories are developed which purport to explain many/most/all causal links.*

Interdisciplinary Position: *Different scholarly communities develop incomplete and biased perspectives on reality. Yet these can be integrated into a more holistic and less biased (meta-paradigmatic) perspective. If this is true for every combination of perspectives, then consistency can be sought at the level of the scholarly enterprise as a whole. Yet this will occur not in the form of some grand theory(ies) but in the form of a complementary set of theories each shedding light on different aspects of reality.* Most of the literature on interdisciplinary practice refers to interdisciplinary analysis of particular questions or topics (including the Klein and Newell definition cited at the beginning of this paper). Interdisciplinarians have rarely directly confronted the possibility of integrating across scholarship as a whole. Yet if integration is possible across any set of interdisciplinary perspectives, it is possible across all. To be sure, integration becomes more difficult the greater the differences among the disciplines involved. But it is always possible to integrate and thus achieve (a messy) coherence among any set of perspectives.

   It cannot be stressed too much that an interdisciplinary view of the unity of science is entirely different from the modernist view. The modernist dream was/is of a simple unity anchored in a very small number of theories and methods. The interdisciplinarian suspects that a very large number of theories will have insight to provide, and urges the use of a wide variety of methods as well. Modernists might well object that such a unity is purchased at too great a cost, for this mass of different insights, even if complementary, will be almost impossible for scholars to master. Interdisciplinarians could well respond that scholarly understanding cannot be made less complex than the world it interrogates. Nevertheless, it behooves interdisciplinarians to show how interdisciplinary understandings can be organized so that their

insights are more readily appreciated. I have argued above and in Szostak (2003) for a link-based approach to scholarly understanding: This provides one handy means of organizing scholarly understanding. It is also possible to develop convenient typologies of theory types and methods and the biases/errors that afflict scholarship (see Szostak, 2004). While the number of causal links is huge, and the number of theory types large (happily there are only a dozen methods, broadly defined, used by scholars), the unity of science can be sought in the application of a *finite and countable* set of theory types and methods to a *finite and countable* set of causal links.

The postmodern suspicion of "meta-narratives" encompasses much more than grand theories; in particular, it embraces ideologies such as Marxism or liberal democracy. In all cases, though, it reflects a suspicion that knowledge that operates over a broad compass is simply unattainable. The interdisciplinarian can join in the suspicion of meta-narratives. Indeed, Newell (2007) celebrates the fact that interdisciplinary practice reflects a suspicion of meta-narratives and a focus on well-defined issues or questions. For example, the link-based approach urged above highlights the simple fact that grand theories tend to shed much more light on some links than others.[20] Yet the interdisciplinarian need not abandon hope of some complex but internally consistent holistic understanding of complex processes. In looking deeply at the sources of perspectives of all sorts, interdisciplinarians tackle the main concern of Lyotard: that meta-narratives by their very breadth influence our thoughts in ways that we are not aware. Scholars may then be biased toward "finding" evidence in accord with meta-narratives. Yet interdisciplinarians can reject simplistic understandings without rejecting understanding. Interdisciplinarians need to convince the scholarly community and the wider public that enhanced understanding is possible but can only come in the form of complex multifaceted explanations.

III. Practical Considerations

The epistemological positions outlined above suggest and reflect attitudes toward practical questions of scholarly practice. Three key issues are addressed here in turn. First, how should scholarly works be judged? Second, what attitude should scholars display toward methods (with more detailed discussions of the role of reason and intuition, and of methodological individualism), and also toward theories? Finally, the "postmodern condition" and ethics are considered. These issues can be seen to fit loosely here for they involve attitudes toward human behavior and the contemporary world.

10. Scholarly standards

Postmodernist Position: *There are no universal standards by which scholarship can be judged.*

Modernist Position: *Modernists have often sought one unique standard: Falsification was for many decades heralded as the essence of scientific research before it was shown to be impossible. (More recently, a variety of near-universal standards, such as replication, peer review, and full disclosure are advocated.)*

Interdisciplinary Position: *Interdisciplinarians believe that scholarly judgment is possible, and indeed that they can critique disciplinary contributions in meaningful ways in order to arrive at holistic understanding. Implicitly at least they have doubted that there is one unique standard of judgment.* Dow (2001, pp. 64-65) urges scholars away from both a belief that there is one best way to do scholarship and a belief that there are no standards of scholarly judgment: Instead different approaches to knowledge should be "compared." We have spoken at length above about the need to identify the biases and errors in any work or scholarly conversation.[21] Works can thus be judged in part in terms of the range of biases or errors implicated, and how important they might have been in the particular piece of research. More generally, interdisciplinarians can and have appealed to the standards of reliability, validity, and representativeness long advocated by (some) philosophers of science. As discussed at length in Szostak (2004), even "interpretivist"[22] scholars who officially disdain such standards often end up employing them in their own work. Note that validity—does a particular research conclusion reflect reality—only makes sense as a standard if one accepts both the existence of an external reality and some human capacity to represent this. Even the standard of reliability—will similar research efforts reach similar conclusions?—makes less sense if one doubts that research is probing a unique external reality. Likewise, representativeness—does the research result apply more broadly than to the subjects of the research itself?—relies in part in a belief in a unique reality. In all three cases, one need not (and should not) believe that perfection is attainable, but only that one research project can reasonably be judged more valid or reliable or representative than another.[23]

   Our ability to evaluate any work in terms of these standards will depend in turn on the degree to which the main arguments, assumptions, conclusions,

and evidence are clearly spelled out. We have recognized above that different scholarly questions may lend themselves to different degrees of clarity in exposition, but can nevertheless judge the degree to which scholars were as clear as they could be. Note that lack of clarity is often a rhetorical strategy, and as such would be addressed in investigating biases and errors. Moreover, it must be appreciated that clarity cuts both ways. Alvesson (2002, p. 141) critiques the norm of scholarly practice whereby authors strive for a watertight argument and carefully downplay counterarguments. Once it is appreciated that there is no perfect argument, this strategy is obviously flawed. Scholarship would advance best if authors admitted the pros *and* cons of their argument, strengths and weaknesses of their evidence, and possible alternative conclusions (and perhaps also reflected publicly on their own likely biases). Finally, note that an insistence on clarity is entirely consistent with a belief that language is *partially* ambiguous, for it allows readers to better investigate biases in language use.

As noted above, there is an apparent inconsistency in postmodernists arguing in favor of an understanding that understanding is impossible. Communities of postmodern scholars implicitly need some standards by which to reflect on each other's work. Thus while postmodernism deliberately avoids establishing criteria by which scholarship as a whole can be judged (Rosenau, 1992, p. 136), many postmodernists thus admit that there may be local standards. One community may value parsimony and another elegance, and thus their conversations will evolve toward different conclusions. There would be no basis to choose between these conclusions. Rosetti (2001, pp. 309-310) celebrates the fact that such local standards prevent scholarly communities from "descent into relativism" but accepts the verdict of relativism across communities with alacrity (though she then proceeds to urge feminists to be open to conversation, criticism, and evidence). Notably she argues that standards such as "objective" versus "subjective" or "rational" over "intuitive" are arbitrary. We have followed Nelson (2001) above in urging scholars to recognize the good in both objective and subjective analysis, and rational and intuitive analysis (see also Szostak, 2004). And thus the interdisciplinarian can reasonably integrate the perspectives of communities making different choices by critiquing excessive reliance on rationality in one and excessive reliance on intuition in another. In so doing interdisciplinarians act in accord with both the postmodern contention that rational analysis should not be privileged, and the fact that in practice postmodernists rely primarily on rational arguments to make their case (Einstadter & Henry, 1995, chap. 12). The standards by which such judgments

are made are not absolute—scholars can disagree about the optimal balance between rational and intuitive exploration—but are not entirely arbitrary either. And interdisciplinarians always have recourse to the broader standards of reliability, validity, and representativeness in reaching such judgments. And even if scholars in the end disagree somewhat, there is still value in clearly elucidating to what extent different conclusions depend on different local standards.

It was argued above that interdisciplinarians (should) embrace a hope for a greater coherence or complementarity across integrated scholarly understandings. Thus one standard by which research can be judged is consistency with other scholarly understandings. Yet, of course, scholarship advances by from time to time overturning received understandings. The interdisciplinarian, suspicious that all disciplinary perspectives are misguided in some way, needs to be especially careful in applying this standard. If a work seems broadly correct but reaches conclusions inconsistent with other works, this suggests not rejection but an integrative effort to identify and transcend the sources of this inconsistency. This integrative approach is complementary to the "web of belief" approach advocated by Rachels: Individuals need "beliefs" to guide their lives but should be open to changing any one of these in light of new information (see Szostak, 2004, for a discussion of this and related philosophical approaches).

Disciplinary scholars often criticize interdisciplinary scholarship for failing to conform to their standards. Interdisciplinarians need to appreciate the value of disciplinary standards, but also their limitations (and can often usefully educate disciplinarians on the latter). And interdisciplinarians need to clearly elucidate their own standards. In addition to the concerns noted above, interdisciplinarians need to insist that interdisciplinary research itself conform to a standard of "adequate understanding of specialized research." Like other standards, this is easier to conceive in principle than apply in practice, but it is critical nevertheless. Interdisciplinarians can only do "good" integration if they understand the theories, methods, and perspectives of the disciplines at hand. Of course, if interdisciplinarians are required to understand these exactly as well as disciplinary scholars do, then the interdisciplinary enterprise is seriously undermined.[24] But the community of interdisciplinarians can insist that integrative work not be superficial: that each discipline be embraced enough that arguments about its theory, method, and perspective are broadly correct (where the interpretation of "broadly" may well vary with the importance of that discipline to a particular inquiry). And this standard can be policed both by evaluating the written

report itself (and having it refereed by those familiar with the disciplines in question) and by looking at the research process: Are several works from each discipline cited (and if not, why not), and were scholars with different disciplinary expertise consulted?[25]

The path-breaking work of Repko (2008) suggests that there is a set of interdisciplinary best practices. The community of interdisciplinary scholars should strive for consensus around such best practices and then judge works in terms of these. Authors in turn should be explicit about how they did or did not perform each step in the interdisciplinary process.

Finally, it is worthwhile yet again to distinguish interdisciplinary efforts at integration from postmodern critiques: While interdisciplinarians must believe that disciplinary perspectives are limited, they need not and should not believe that they are necessarily entirely misguided. Indeed I have urged in Szostak (2005) a "kernel of truth" belief that any attitude long held by any group of people likely has some kernel of truth in it. The goal of interdisciplinarity—whatever the degree of suspicion one may have toward disciplinary structures—is to integrate disciplinary (and other) perspectives, not to dismiss these.

11. Scholarly Methods

Postmodernist Position: *There is no unique scientific method that allows confidence to be placed in truth claims.*

Modernist Position: *There is one best scientific method (or there is one best method for most/all questions).* Dow (2001, pp. 65-67) notes that this attitude has declined in importance over time: She urges scholars to use and critique multiple methods, recognizing that each is best suited to different tasks.

Interdisciplinary Position: *There are many methods, each with different strengths and weaknesses.* This follows from the belief that each discipline has something to contribute to integrative understanding, and the recognition that disciplines are generally characterized by mutually supportive sets of theory, method, and perspective. Similar arguments were made about perspective above and will be made about theory below. One crucial way in which interdisciplinarians can evaluate the results of disciplinary research is to ask what weaknesses the favored method exhibits when examining the question at hand. Szostak (2004, chap. 4) developed a typology of the

strengths and weaknesses of methods, and placed each of the dozen scholarly methods within this: Scholars—whether researchers or those evaluating research—can thus gain a valuable starting point for appreciating the problems that a particular method might encounter in a particular context.

If interdisciplinarians need to be open to different methods, they need also to be open to different methodologies that influence which methods are preferred: qualitative and quantitative, interpretivist and positivist, deductive and inductive (Szostak, 2004, pp. 109-113). Natural scientists have long spoken of a "scientific method(ology)" that involves formal hypothesis testing and quantification (and is most closely associated in recent decades with experimentation, though statistical analysis is often judged acceptable). Postmodernists are often dismissive of the scientific method (despite their general plea for methodological diversity), while modernists extol its virtues. The interdisciplinarian recognizes its considerable strengths but also its weaknesses. When scholars investigate hard-to-quantify phenomena, and especially those that reflect attitudes, other methods and methodologies have a key role to play.

11a. Reason and Intuition

Postmodernist Position: *Postmodernism celebrates intuition and argues that rational argument should not be privileged (in large part because it reflects power relationships).* Rosenau (1992, p. 128) suggests that postmodernists attack reason because it is modern, because arguments from reason often abstract from difference (though this need not be the case), and because those who believe in reason tend to devalue emotion and intuition (though again this need not follow).

Modernist Position: *Science proceeds to better understanding through the exercise of reason (and empiricism) alone.* It must be stressed that philosophers and historians of science have long known this not to be the case. One of my favorite books is Beveridge (1957), in which he notes that scientific advance always involves an (intuitive) act of inspiration sandwiched between rational stages of problem analysis and critical revision. More broadly, philosophers have long recognized some good reasons to heed our intuition: It is informed by our life experience, and may moreover reflect evolutionary selection (or the will of God). See Szostak (2002a, 2005, chap. 2). Still, a modernist might argue that research reports should be written up (as indeed they generally are) as if reason and empiricism were the only forces at work.

Interdisciplinary Position: *Both reason and intuition have a place in both the acquisition and evaluation of scholarly insights.* This follows from a recognition that at least some scholarly disciplines rely heavily on intuitive understandings. Likewise, there have long been philosophical traditions—such as Romanticism—that have celebrated emotion; the interdisciplinarian is naturally guided to integrate such views with those more common philosophical expositions on the value of reason. Szostak (2005, chap. 2) is largely devoted to showing how reason, empiricism/experience, and intuition are *complementary* sources of understanding.

McCloskey (2001, p. 110) suggests that unlimited rationality would eventually enslave human societies in rules: Humans need recourse to our intuition to remind us of what is important in life. Human reason all too often simplifies, whereas intuition often warns us of ambiguity and nuance. In particular realms, such as investigating the psychological impact of the arts, human intuition has an even more obvious role to play. Yet intuition is hardly infallible. Indeed, the biases and errors that have been described above largely work subconsciously, and are thus especially likely to pervert human intuitions. It thus makes sense to use one's reason to analyze one's intuition. Moreover, if one joins skeptical postmodernists in rejecting reason altogether, then it is not at all clear that one can justify academic argumentation: There is no use in explaining one's unevaluated intuitions to another, for they should just follow their own intuition.

11b. Methodological Individualism and its Denial

Postmodernist Position: *Individuals are fragmented creations of the worlds they occupy.* Cullenberg et al. (2001, p. 21) are among many who would include "denial of the independent self" as a key postmodern tenet. Note, though, that Foucault (who rejected the title of postmodernist, but is often viewed as instigating much postmodern thought) objected not to individualism itself but to a coercive notion of individuality that privileged individual-level influence (Mourad, 1997, pp. 123-124). Some postmodernists resurrect a "postmodern individual" who is fragmented but self-conscious, and thus has a severely curtailed ability to act in a present-oriented and transitory fashion (Rosenau, 1992, pp. 53-56).

Modernist Position: *Individuals are autonomous creators of their social conditions.* This position has characterized Psychology and Economics, though it has not for the most part characterized Sociology or Anthropology.

Interdisciplinary Position: *Causation runs in both directions between individuals and societal aggregates.* This may well be the most controversial of my suggested interdisciplinary positions. Yet it follows from the simple fact that interdisciplinarians in human science can and do integrate across disciplines such as Economics or Psychology which privilege the individual and disciplines such as Anthropology and Sociology which have tended to privilege the social context.[26] Indeed to understand most complex social processes one needs not only to comprehend the motives of individuals (and the meanings they attach to their actions and those of others), but also how institutions and values constrain individual behavior. Szostak (2003), for example, showed in detail how causation in both directions can be readily encompassed within an overall understanding of culture.

Postmodernists stress that individuals are embedded in "discourses" (which is not quite the same as the longstanding sociological emphasis on the roles people play) and that in contemporary society they are necessarily engaged in multiple and conflicting discourses that generate fragmented personalities. Postmodernists make the important point that the same person thrust into different discourses will behave differently (Alvesson, 2002, pp. 50-51). In other words the person can only be defined in relation to others, for these others will shape who the person is (Malpas, 2001, pp. 70-71). Yet it is equally true that different people will act differently within the same discourse; nor, as any parent can attest, can these differences in behavior be readily attributed to their different discourse history.[27] And thus it must seem that causation in both directions occurs. Social constructionism (among many approaches) is grounded in the recognition of two-way causation: Individuals interact in generating social constructions of reality that in turn constrain the behaviors of individuals and groups. Interdisciplinarians may debate which direction of causation is most important. (As for which came first, I would note that humans evolved as social animals, and thus the entire history of our species has reflected causation in both directions.) My hunch is that such a debate is best conducted with respect to particular research questions rather than at a global level. I would suggest that a postmodern insistence on societal-level influences is the sort of meta-narrative that postmodernists themselves should view with suspicion.

Postmodernists also argue that the individual is always in process, and thus does not persist: A new individual is born at every moment. It thus makes sense to treat such individuals not as causal agents but as creatures of

their environment. Logically, though, there must be something that persists to always be in process (Devaney, 1997). In practice, too, the individual at any moment is shaped not only by immediate circumstances but also by thoughts and attitudes that they recall from their past.

Charusheela (2001, pp. 208-209) argues that only the idea of "situated subjects"—who do not lack agency, but are recognized to enter the world with a particular sociocultural inheritance—allows scholars to escape the twin dangers of ethnocentrism and relativism. If agency is denied, then one is forced to accept the dominant views within any cultural community. If agency is accepted, one can support efforts within any community to achieve, say, gender equality. (Note, though, that it is not at all clear in her analysis how one makes such a decision as to what movements are worthy of support; I will suggest below a universal ethics that is consistent with multiculturalism.) Such efforts only make sense if people in turn appreciate the cultural constraints on us all.

The idea of fragmented individuality is unproblematic within the approach recommended in Szostak (2003). Causal arguments are not made in terms of particular individuals (or particular societies) but in terms of particular individual-level phenomena: motivations, emotions, abilities, personality dimensions, and schemas. The latter term refers to individual thoughts about themselves, others, and how the world works. Individuals can differ in the complexity of their schemas. It is quite possible for these to be highly context dependent, and this provides one way in which to understand how individuals behave differently in different settings.[28]

12. Theory

Postmodernist Position: *Postmodernists exhibit a clear preference for any analytical work to be carried out at a very local level.* Moreover, while postmodernists theorize in practice they are suspicious that theories are unable to appreciate diverse points of view (Rosenau, 1992, p. 82). Any theory is necessarily incomplete because theorists stand in different places and see different things (Rosetti, 2001, p. 319).[29]

Modernist Position: *Modernists stressed highly generalizable theory, and often pursued the goal of one unified theory of everything.* McCloskey describes several historical instances of "modernist" thought, each instantiated in a belief in some overarching theory (2001, pp. 109-110).

Interdisciplinary Position: *Understanding advances best through the integration of diverse types of theory.* As with method and perspective, this position follows from the interdisciplinary practice of integrating across disciplines that utilize quite different types of theory. As noted above, interdisciplinarity holds out some hope of a unified (or at least consistent) scholarly enterprise that does not privilege a particular theory or method. We can only celebrate "unified science" while remaining suspicious of "grand theory" by recognizing that science can be organized around the application of a finite set of theory types and methods to the study of a finite set of phenomena and the causal relations among these.

Szostak (2004, chap. 3) develops a typology of theory with five key dimensions. We have already seen arguments for the value of different theories along each of these dimensions: The scholarly enterprise needs theories that are generalizable and theories that are particularistic, theories that stress individual-level causation and theories that stress societal-level causation (as well as theories that embrace the actions of non-intentional agents such as trees or tornados), theories that involve rational decision-making and theories that involve non-rational decision-making, theories that focus on actions and theories that focus on attitudes, and finally theories that emphasize change and theories that emphasize stability. Modernists have urged generalizable, individual rational actions generating social stability. Postmodernists, when they theorize, stress localized societal attitudes that are neither primarily rational nor stable. One problem with the postmodernist approach is that the scholarly community will end up with a huge number of theories and no way of choosing (Rosenau, 1992, pp. 89-90). Interdisciplinarians can pursue integration over an even broader range of theory.

Even a very flexible and affirmative postmodern approach, such as Alvesson's (2002, p. 131) reaches the conclusion that "In my experience it is best to concentrate work within a particular theory" (or at least a family of theories within a particular paradigm) because one must be socialized to the paradigm in which the theory(ies) reside. Interdisciplinarians have shown that it is quite possible to integrate across quite different theories. Interdisciplinarians can and do debate to what degree this task can be performed by an individual as opposed to teams of researchers.

Modernists are confident that theory and fact can be distinguished. Postmodernists stress the theory-ladenness of facts. We need not revisit the epistemological arguments above: Interdisciplinarians recognize that theories influence what scholars see,[30] but not exclusively so.

13. The Postmodern Condition

Postmodernist Position: *Foremost, there is a concern that human progress, if such a thing ever existed, has ground to a halt. Economic growth, technological advance, and even the spread of democracy generate more problems than they solve. Two corollaries follow. There is widespread doubt that human reason and ingenuity can solve the world's problems. And this is related to a concern that the contemporary world is too complex and unpredictable for purposeful human action to have much impact on the future course of events.* Wood (2003) thus associates the postmodern condition with a fatalistic post-intellectualism.[31] The postmodern condition encompasses a vast array of critiques of contemporary society. Some commentators worry about capitalist excess, others about the relentless march of technology, others about environmental destruction, others about rampant consumerism, and still others about the effects of mass media on both individual and community.

Alvesson (2002, pp. 35-37) notes that concerns about the postmodern condition are in some sense separable from the epistemological and methodological postmodern concerns dealt with above. Many postmodernists engage only one or the other. The two do influence each other: Deconstruction exposes elements of the postmodern condition, while concerns about the postmodern condition encourage different ways of looking at the world. Both are characterized by a lost faith in science, individualism, and truth.

Modernist Position: *Human reason was gradually but inexorably creating a better world.* Alvesson (2002, p. 38) speaks of a belief in humanity's ability to perfect itself through rational thought. McCloskey (2001, p. 103) speaks of a tendency to celebrate the "modern" as inherently superior; she suggests appreciating the advantages of modernity without reifying modernity. Needless to say, the World Wars and the Great Depression had caused almost everyone to reflect on whether progress was truly inevitable.

Interdisciplinary Position: *Interdisciplinarians believe that both reason and intuition can be harnessed toward societal improvement. They recognize that the world is complex, but still hold out hope of enhanced understanding. While interdisciplinarians have rarely if ever confronted the idea of progress explicitly, it would thus seem that they would likely view it as neither inevitable nor impossible.* The first two statements follow from previous analysis. The concluding sentence is based on the premise that enhanced understanding of the world should at least some of the time translate

into strategies for improvement (though perhaps not as fast as other forces conspire toward societal decline). This point is made forcefully by Newell (2007): "In interdisciplinary studies, the proof of the pudding is in the eating: Does the more comprehensive understanding allow more effective action?" Newell argues that the interdisciplinarian should revisit an analysis if it fails in this respect.

There is not space here to interrogate more specific postmodern concerns. We dealt above with the concern about "fragmented individuals" that figures large in many critiques of the postmodern condition. The fact that different postmodernists critique different elements of the postmodern condition provides a further incentive to analyze causal links in isolation: If the causes of consumerism are distinct from the causes of information overload, then perhaps the solutions are as well. Likewise, there is value in analyzing progress in terms of distinct phenomena, rather than assuming that the world is characterized either by progress (as modernists do) or regress or stasis (as postmodernists do).

14. Ethics

Postmodernist Position: *There can be no universal ethics.* Postmodernists hail instead a respect for diversity (and thus espouse one universal ethical standard).

Modernist Position: *There are universal ethical standards.* Note, though, that for much of the 20th century philosophers turned their back on ethical analysis in favor of explorations of logic and other subjects that lent themselves to "scientific" rigor. As philosophers of science came to appreciate that scientists could neither prove nor disprove their statements, philosophers came to view ethical analysis less negatively.

Interdisciplinary Position: *Interdisciplinarians believe that it is both possible and desirable to integrate across different ethical perspectives.* This is a formal part of my definition of interdisciplinarity (above), and implicit in others, for naturally ethical outlooks form a part of any disciplinary (or other) perspective. Ethical perspectives are thus discussed at some length in Szostak (2004, chap. 5) when scientific practice is investigated.

Szostak (2005) argues that the best possible reason to believe in any ethical statement is if this can be justified by each of the five types of ethical analysis. Such an approach allows humanity to combat the ethical challenge

of our time (which is instantiated in the postmodern condition): How can we respect diversity, while also encouraging respect for responsibility, honesty, and a host of other desirable practices and attitudes? While the postmodern position to a large extent reflects a belief that one cannot have both respect for diversity and respect for particular values, it also reflects a concern with certain widely held modern viewpoints. Postmodernists worry that modern people are puritanical, overly concerned with self-authentication, and live righteous lives of self-denial (Rosenau, 1992, p. 42; she later speaks of the selfish pursuit of income and power). Yet the skeptical postmodern position articulated above leaves people largely free to believe whatever they want, whereas the analysis in Szostak (2005) suggests a respect for diversity, a balance between individual reflection and societal responsibility, and a balance between pleasure and service. Note also that the question of human progress cannot usefully be analyzed unless some ethical consensus on what is "good" is first achieved.

Postmodern suspicions of ethics and progress both support and reflect postmodern suspicions that public policy cannot be improved by scholarly analysis.[32] Even affirmative postmodernists, though open to limited forms of ethical and policy analysis, prefer a scholarship that is broad and descriptive (and emphasizes style) rather than predictive and policy-oriented and clear (Rosenau, 1992, pp. 13-14, 169).[33] In part, postmodernists rebel against the privileging of expert advice in public debate: Interdisciplinarians can respond that it is possible and desirable to integrate across scholarly and non-scholarly understandings (see Szostak, 2002); they can also urge that scholarly understanding be clearly communicated to the wider public (Szostak, 2005, chaps. 7, 8, discusses some ways in which this might be done). More generally, interdisciplinarians can suggest that public policies reflect the integration of ethical perspectives, theories, and methods, and do not ignore relevant causal links (Szostak, 2005a).[34]

Postmodernism need not be associated with any political ideology (Rosenau, chap. 8). Indeed, postmodern despair reflects a belief that there is no basis to choose between ideologies. Szostak (2002b) showed that political ideologies are each largely grounded in different types of ethical analysis: True conservatives respect tradition, classical liberals emphasize rights, pragmatic liberals stress consequences, socialists argue from virtue, and nationalists and many environmentalists appeal to intuition. If interdisciplinarians can integrate across types of ethical analysis, they can also integrate across ideologies. Moreover, activists can try to appeal to multiple ideologies in urging particular policies.

Concluding Remarks

Postmodernists may claim that I have not fully appreciated their grounds for extreme skepticism (and modernists may have similar complaints). I have suggested more than once above that the degree to which postmodern concerns militate against enhanced understanding is an empirical question. (Moreover I have appreciated that few if any postmodernists may ascribe to every postmodernist view outlined above.) It is important and valuable to identify potential barriers to human understanding; it is then necessary to ask how much these interfere with particular inquiries. Yet I have also appreciated that scholarship is an ongoing conversation in which conclusive proof is impossible. Judgment is called for in evaluating postmodernist claims, and scholars may well disagree on how much faith can be put in any scholarly pronouncement.

Intuition likely plays an important role (as it should) in determining one's disposition toward skepticism. Such intuitions deserve to be interrogated. I myself have often walked out of committee meetings despairing of the inability of even well-educated people to fully articulate their thoughts or fully understand the thoughts of others. I have been astonished that what seemed to me to be obvious efforts at manipulation or coercion were not clearly perceived as such by others. At such moments it is easy to accept extreme skepticism of the possibility of rational human action. And in a world of manipulation, close-mindedness, and pigheadedness, every individual from time to time is treated by others in ways that show insufficient respect for one's being: The denial of individual authenticity spares us the angst associated with such moments. Yet there are many other moments in life when I have engaged in open honest conversations that seemed to lead to mutual enlightenment. At such moments it is hard to think that there is not some hope for enhanced understanding. Moving from the personal to the societal level, it is all too easy to be annoyed by the superficiality of political debate: Whatever one's political preferences one can all too readily observe politicians one disagrees with getting away with statements that seem completely misguided. One must be *very careful* to respect the views of others, but can still wonder at such moments if human reason plays much role in affairs of state. And then it is tempting to deny that it plays any role whatsoever, and thus free ourselves from the frustration-intensive responsibility of effecting social change (or alternatively free to make whatever arguments one feels without recourse to reason, and happily applaud others for doing the same). Yet one can also appreciate that most people have developed some sense of the value of democracy or rule of law or human rights, and thus that our gov-

ernments to at least some extent are guided to act reasonably. And if this is the case, then one cannot be freed by postmodern skepticism from the social responsibility to make reasoned arguments for social progress or to critique the unreasoned arguments of others.

While few scholars might accept all of the positions associated above with postmodernism, the label of "postmodern" serves an important purpose in allowing skeptical scholars some protection against not being published or hired because of their "odd" views (Alvesson, 2002, p. 40). "Interdisciplinarity" is also a popular term—though my spellchecker rejects this while accepting postmodernism—and can thus be an attractive banner under which to work. It is therefore critical that "interdisciplinarity" mean more than a congeries of suspicions of disciplines. Interdisciplinary scholarship has a key role to play in the academy alongside more specialized research. The basic tenet of postmodernism is that scholars cannot rationally choose among competing perspectives: Only by showing that it is possible to integrate across different perspectives can postmodernism be transcended. The path toward a better society leads from integration through enhanced understanding. It is not an easy path, but it is a worthy path to tread. Interdisciplinarians must strive as a community to mark the path as clearly as possible. Interdisciplinarians have well-articulated responses to postmodern criticisms, and these responses in turn protect scholarly activity from modernist excesses. Yet these responses are not always explicit in the literature on interdisciplinarity: This paper has striven to make them so.

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Notes:

[1] Malpas (2001, p. 4) notes both that it is impossible to provide a tidy definition of postmodernism, and that postmodernists disdain tidy definitions.

[2] Cullenberg et al. (2001, p. 23) note that in many fields postmodernism accentuates changes already underway, such as grappling with uncertainty or worrying about representation. Rosenau (1992, p. 3) had urged social scientists to take advantage of the postmodern contribution "without becoming casualties of its excesses." One can critique postmodernism without celebrating modernism (20). Rosenau later identifies seven inconsistencies in postmodern thought: It theorizes against theory, uses reason against reason, opposes ethical argument but fights for the marginalized, emphasizes intertextuality but deconstructs individual texts, judges that there are no criteria for scholarly judgment, attacks modernist inconsistencies while celebrating its own, and attacks truth claims while asserting truth claims (pp. 176-177).

[3] This at least can be said of interdisciplinarians such as Klein and Newell, and most/all scholars long associated with the Association for Integrative Studies, but would be questioned by interdisciplinarians who take a more critical stance toward the scholarly project.

[4] Detmer (2003, chap. 2) provides eight reasons why it is illogical to claim as objective truth that there is no objective truth, including the fact that postmodernists could not know this to be true without privileging their insight over others who disagree.

[5] Postmodernism in the arts shares some similarities with postmodern philosophy—the distinction between high and mass culture is collapsed, playfulness is encouraged, and eclecticism applauded—but in other ways they are quite different. This in turn reflects the fact that modernist art, in rejecting representation and celebrating the unfamiliar, was itself quite different from modernist science (Alvesson, 2002, pp. 20-21). One might describe postmodern art as rejecting a modernist belief that art evolved according to its own logic (Mourad, 1997, p. 115). Interdisciplinarians can and should ensure that our understanding of art reflects the results of integration. There are chapters on art in both Szostak (2003) and (2005).

[6] Stuhr (2003, p. 2) suggests that pragmatism needs to be revised to deal with postmodern concerns such as diversity, technology, power, and an emphasis on social criticism. Later (pp. 184-186), Stuhr urges philosophers to embrace multiple epistemological approaches rather than just one.

[7] Cahoone (1996, p. 16) identifies "constructive otherness"—whereby the apparent unity of concepts is recognized to depend on their often-hidden contrast to other concepts—as the key strategy of postmodern inquiry. This strategy can be used by interdisciplinarians to identify that which has been excluded from analysis.

[8] Transdisciplinarity resists definition. In its earliest days it meant a type of interdisciplinarity organized around some grand theory or ideology. Today,

it has a broader usage and overlaps with the way interdisciplinarity has been defined here. In identifying its key features, Gibbons et al. (1994, p. 5) merely distinguish transdisciplinarity from disciplinarity.

[9] Mourad (1997) actually refers to "Enlightenment thinking" and thus implies that there was little evolution over a period of centuries in "modernist" thinking. We have seen above that this is not the case. Mourad's idealist critique guides him often to extreme characterizations of modernist thought. These are useful for the purposes of this paper, but are often characterizations that few scholars would accept as accurate characterizations of their outlook.

[10] Newell (1998) has suggested that reality may itself be contradictory. If so, this would provide a further rationale for respecting diverse perspectives. Newell provides as an example the likelihood that both "free will" and "determinism" are "true" for any individual. I would see this as evidence not of a contradictory reality but of the need to distinguish carefully the extent to which (and circumstances in which) an individual is free versus constrained.

[11] Mourad earlier (1997, p. 121) notes that the modernist belief that there are numerous uncontroversial facts to be communicated to students, and thus that education is about transmitting knowledge rather than teaching students how to think, raises questions of the need for professors. Interdisciplinarity provides a useful role for professors in showing how integrating diverse viewpoints leads to enhanced understanding of reality.

[12] This point was made by Klein and Newell (1996a). They (most recently in the *Encyclopaedia of Life Support Systems*), and Jack Meek have often written since on the relationship between complexity and interdisciplinarity. See Newell (2001) and (2007).

[13] I have avoided the use of the word "system" here for a couple of reasons. The word tends to imply a certain stability, whereas complex networks of interrelationships are inherently unpredictable. The word also implies autonomy, whereas one of the key arguments of Szostak (2003) is that there are causal interactions between almost any pair of phenomena: any system of phenomena will thus inevitably influence and be influenced by many other phenomena.

[14] Alternatively, Cahoone (1996, p. 15) argues that postmodernism has borrowed a belief from structuralism that "things" can only be understood in relationship to other things. Interdisciplinarians, while likely granting to individual phenomena more coherence and unity than Cahoone's interpretation of postmodernism would allow, could nevertheless be applauded for focusing on complex interrelationships.

[15] "Far from allowing us to sit back and destroy texts and meanings, a deconstructive/postmodern questioning of assumptions and meaning impels us to *give* meaning to the words we use and the ideas we explore and create" (Rosetti, 2001, p. 323). Rosetti could be described as an affirmative postmodernist. She worries that the terms people use to describe things are not

inevitable—we would not use "heavy" if living in zero gravity—but arguably the problem of representation is manageable in such cases. Alvesson (2001, p. 53) worries, "Since any something may be constructed/expressed as many different objects …, meaning can never be final." Note that the phenomena identified in Szostak (2003) were defined in terms of their primary function, and that the different causal links that connect these to all other human science phenomena allow the different facets of their role in human societies to be explored in turn.

[16] Research by linguists on pidgins, Creoles, and "trading zones" supports the argument made here that communication across communities is possible if care is taken in language use.

[17] Feminists in particular have made valuable use of an (affirmative postmodernist) argument that is compatible with the interdisciplinary position outlined here.

[18] For Cahoone (1996, p. 15), the denial of authorial authority reflects a deeper postmodern denial of the possibility of "returning to, recapturing, or even representing the origin, source, or deeper reality behind [any] phenomena…."

[19] As Dogan and Pahre (1990) discussed at length, even specialized research reflects evolutionary tendencies for fields to coalesce and separate over time: if fields from two disciplines coalesce, the result is a specialized sort of interdisciplinarity, though theoretical and methodological flexibility is soon/immediately constrained.

[20] Bertens (1995, p. 246), following Giddens, notes that just because the grand theories of Marx, Weber, or Durkheim were imperfect does not mean that they were wrong, as is commonly assumed: The world may simply be more complex than these thinkers recognized.

[21] Cullenberg et al., 2001, p. 27, note that the appreciation that there is no one standard by which to judge scholarship need not lead to despair. It does however force scholars to face up to the power relations implicit in scholarly research.

[22] Interpretivism overlaps with postmodernism in various ways, including a suspicion of causality. Interpretivists seek meaning, an exercise which skeptical postmodernists would disdain. And interpretivists are more prone to defining an actor's context in terms of broad psychological or cultural forces than postmodernists who stress the uniqueness of local contexts.

[23] Alvesson (2001) dislikes the word "validity" (largely because of skepticism of an external reality) but explicitly utilizes standards advocated in its name. He also notes that pragmatism provides an alternative (though arguably complementary) standard, though in practice it can be hard to judge whether a particular scholarly work helps individuals to cope (and one would certainly have to wait a long time to perform such an evaluation; as Alvesson then notes one would then have to deal with the evolution of ideas: To what extent can Marx be blamed for Stalin's interpretations?)

[24] One might be tempted to say "destroyed." However, disciplinarians do not

spend all of their time learning basic concepts or theories. While it is bad
interdisciplinarity to get a theory or concept "wrong," there may be some
advantages in interdisciplinarians reading these differently—as long as these
different understandings are the subject of further discourse.

[25] Postmodernists and others have criticized attempts to define ideal research
processes, for these fail to acknowledge the complexities and contingencies of
actual practice: They instead encourage collaboration and diversity. Arguably,
criticisms of narrow disciplinary models of research do not apply to idealized
interdisciplinary processes such as in Newell (2001) or Szostak (2002) or
Repko (2008), for these reflect integration across diverse perspectives.

[26] Postmodernists celebrate the death of the subject—defined as an agent
capable of purposive action toward the accomplishment of a task—because of
a recognition that agents are not in complete control. But sociologists had long
recognized that agents were not in complete control (Lyman, 2001, pp. 216-218).

[27] Bourdieu's concept of "habitus" implies that each individual represents a
unique set of cultural and personal experiences (Rosenau, 1992, pp. 58-59).
It thus allows some scope for individual agency, but limits the sources of
individuality.

[28] Cognitive scientists generally appreciate that the human mind has many
separate "programs" and weak coordinating devices. Elliott (1996) celebrates
the fact that human fantasies naturally draw connections across different
elements of our lives. He thus sees fragmentation not as a cause for concern,
but rather celebrates increased "space for radical imagination." He notes that
creativity *requires* some inner contradiction.

[29] Bertens (1995, p. 9) notes that postmodern thought is itself called "theory"
in many disciplines despite arguing against theory in a Popperian (modernist)
sense. Szostak (2004) distinguishes "scientific" theories about how the
world works from "philosophical" theories addressing questions such as the
possibility of understanding.

[30] "It is not merely the insights of disciplines that are skewed, however, but
also the factual information uncovered by the disciplines" (Newell, 2007).

[31] Wood's post-intellectualism has four key characteristics: people are too
specialized to see the big picture, people are overwhelmed by information
overload, people do not perceive that reason governs human affairs, and thus
many blindly accept authority. Later, he notes that post-intellectualism reflects
a lost faith in progress.

[32] Rosenau (1992, p. 168) hypothesizes that postmodernism is less damaging
in the humanities than social (and natural) sciences because the humanities
generate few policy implications. I would argue that humanists have a
potential policy impact in many ways: ethical analysis, textual analysis,
and analysis of the role that the arts (including) literature can/should play in
society being the most obvious candidates.

[33] Nelson (2001, p. 297) suggests alternatively that a feminist postmodernist

Economics would stress pressing social problems and disdain the effort expended on theoretical irrelevancies. As noted above, she defines postmodernism more optimistically than most. Notably she also urges postmodernists to integrate theories from diverse disciplines.

[34] Each of these features is emphasized within recent European and Latin American scholarship on transdisciplinarity. I thank Julie Thompson Klein for this observation.

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