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Elizabeth Bechtel Jayanti

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Toward Pragmatic Criteria for Evaluating HRD Research

Elizabeth Bechtel Jayanti[1]

Abstract

Although well-established criteria exist for evaluating the quality of research conducted using the Positivistic lens, and some criteria exist for judging research conducted using the Postmodernist lens, few criteria exist for judging research conducted using the Pragmatic lens. This is significant as mixed methods, complexity, and systems dynamics research belong to this lens, and a lack of criteria for judging quality may alternately contribute to either a shortage of Pragmatic research or a plethora of lower quality, uncritically evaluated Pragmatic research. The purpose of this article is to propose a theory-building process for Pragmatic research and to explore some possible criteria for evaluating the quality of Pragmatic research.

Problem Statement

The purpose of this article is to abductively develop a boilerplate to evaluate the quality of Pragmatic research including systems research, complex adaptive systems research, and abductive mixed methods research to expand HRD researchers' understanding of Pragmatic research, reduce Pragmatic research studies' false rejection on the basis of dominant Positivistic criteria, and increase the diversity of research in the field of HRD.

[1]University of Minnesota-Twin Cities, Minneapolis, MN, USA

Corresponding Author:
Elizabeth Bechtel Jayanti, University of Minnesota-Twin Cities, 330 Wulling Hall,
86 Pleasant Street Southeast, Minneapolis, MN 55455
Email: bech0031@umn.edu

Toward Pragmatic Criteria
for Evaluating HRD Research

Research processes, procedures, and criteria for evaluating the quality of research evolve as knowledge progresses (Kuhn, 1970). Although there are well-established criteria for judging research and models according to the Positivistic paradigm, and to a lesser extent, some general criteria for judging Postpositivistic research and models (Lincoln & Lynham, 2011; Pratt, 2008), there is little understanding or discussion around what research criteria might serve as benchmarks for models or research conducted according to a midrange Pragmatic perspective (Brookfield, 1992; Putnik & van Eijnatten, 2004). As such, many abductive mixed methods and systems dynamics studies may continue to be judged on Positivist criteria, even though they represent a different paradigmatic approach to science (Istavan, 1992; McKelvey, 2004). The lack of agreed-upon criteria on which to judge the quality of Pragmatic research—including systems research methodologies such as complex adaptive systems research—may inhibit the publication of such research overall.

To understand what is at stake, it may be useful to delineate between complexity, mixed methods, and complex adaptive systems research. Although the three terms may sound similar, they have dramatically different implications in practice. Complexity has been defined the property of a real world system that manifests itself in the inability of any one formalism being adequate to capturing all of its properties (Mikulecky, 2010). The complexity of a system, such as an organization, can be defined by different observers in many different ways. For example, if someone new to your organization asked you and your colleagues to describe your organization to him or her, you would probably come up with a different response than someone in accounting or research and development. Each of you would produce a response that is correct and valid, but each response would be different from another's. Just as there are many ways of describing an organization, there are many ways of capturing the complexity of a system through research.

Mixed methods research is but a single approach to describing the complexity of a system, and often combines qualitative and quantitative measures as a means of capturing the complexity of an organization (Kiessling & Harvey, 2005; Miles & Huberman, 1994). Mixed methods research includes triangulation, complementary or comparative designs, and iterative or nested designs (Cresswell, 2009; Fielding, 2010). As mixed methods frequently combine complimentary qualitative and quantitative designs that are based in either the Positivist, or more frequently, Postmodernist epistemologies, extant boilerplates for research from the respective epistemological type may be used to evaluate the quality of mixed methods research, and as such mixed research may be more or less of an epistemological type. Although it has been correctly suggested that methods are not particular to an epistemological type (Johnson & Onwuegbuzie, 2004), such that quantitative research is not necessarily Positivistic, mixed methods research studies may rarely actually mix *epistemological* orientations within a single study. Some mixed methods research may rely on purely deductive or

purely inductive reasoning processes associated with Positivism or Postpositivism respectively, and cannot correctly be classified as Pragmatic research. To the extent that particular mixed methods studies rely on quantitative and qualitative forms of evidence which have already separately gained widespread acceptance in the Positivistic and Postpositivistic research communities, extant boilerplates may correctly be used for evaluation.

Complex adaptive systems research, however, searches for patterns of behavior to describe a complex environment (Wheelan & Williams, 2003). Complex adaptive systems research assumes that agents of a system interact in accordance to local rules with no top–down master plan (Erikkson, 2007), that systems are dynamic networks of entangled interactions between agents or actors, and not simply static groups (Anderson, 1999; Barabasi, 2003; Potocan, Mulej, & Kajzer, 2006), and that organizational learning is a dynamic, nonlinear, and emerging process in which knowledge is created through the interactions of multiple interdependent people (Harkema, 2003; Stacey, 2003), that people and organizations coevolve (Robertson, 2004), such that people change the organization and the organization changes the people (Stevenson & Hamilton, 2001) and that the outputs of a group project may exceed each individual's input if synergy is involved (Holland, 1998). Complex adaptive systems research does not simply draw on Positivist or Postpositivist research methods, but seeks entirely different forms of evidence, such as microworlds simulating reality (Woodside, 2006) and the existence of patterns (Wheelan & Williams, 2003).

As epistemologies serve as a lens for how we perceive the world and form a language for a research community, making us attentive to particular features of the environment, while concurrently unaware of other features, which become our blind spots (Donmoyer, 1990; Nystrom & Starbuck, 1984; Poggi, 1965), the lack of a boilerplate could contribute to our lack of a systems language. This could potentially impede research progress, specifically leaving systems research outside of the domain of academic HRD publications, even though Swanson suggested that systems research is so deeply ingrained in the field of HRD as to be one of the foundations of HRD's three-legged stool (Swanson, 1995). By limiting the publication of systems models and discussions, there may be a further limited production and diffusion of systems research, and a delay in the progress of the field of HRD. The purpose of this article is therefore to elicit a discussion of potential criteria by which to judge midrange research. In practice, this could contribute to greater clarity of benchmarks on which to evaluate Pragmatic research, reduce the rate of rejection of cutting-edge research on the basis of criteria which rightly belong to other epistemologies, and expand the range of research conducted in the field of HRD.

The original contributions of this article to the research literature are three-fold: first, this article highlights the substantive differences between three maximally different epistemologies—Positivism, Postpositivism, and Pragmatism in terms of four key factors: how they frame the relationship between observer and world, the purpose of models, the questions that they ask, and their approach to logic. An especial contribution is the visualization of how various epistemologies view the relationship between

observer and world. Previous research has not visualized or made explicit the dramatic differences in how the various epistemologies view the relationship between observer and world.

Second, this article proposes a specifically abductive theory-building process which may be used to conduct HRD research belonging to the Pragmatic epistemological lens. Putnik and van Eijnatten (2004) suggested the need for a new research framework, which could either be used as a meta-structure for explanation or to guide research development in the middle range epistemology. Although a mixed-method theory-building process (Johnson & Onwuegbuzie, 2004) and an inductive top–down reasoning process have been proposed (Shepherd & Sutcliffe, 2011), no specifically abductive theory-building process has yet been proposed. This is significant, as a broader abductive theory-building process could be used not only for mixed-method research, but also more broadly for complex adaptive systems and other emerging approaches to complexity research such as phenomeno-semantic complexity (Erikkson, 2007).

Third, this article suggests some potential criteria on which the quality of future Pragmatic research may be judged, which may eventually be integrated into a boilerplate after discussion in the research community. At present, complexity research lacks both a broad theory-building process and a boilerplate for evaluating the quality of complexity research. Arguably, a theory-building process and its anticipated results are deeply interconnected, and description of a theory-building process, which is *process*, naturally lends itself to informing the boilerplate, which essentially describes *outcomes*. Because the other paradigmatic lenses have had multiple scholars recommend outcomes or criteria for boilerplates, my recommendations for a Pragmatic boilerplate are likely to seem weaker by comparison. Boilerplates, like other research products, are always enriched by informed discussion and debate. However, the boilerplate that is proposed may soon become comparable in richness to the boilerplates for other forms of research if readers take up the task of discussing and debating this significant issue.

Although it may be desirable to focus closely on the Pragmatic epistemology, which is the phenomenon of interest for this article, to focus on a single, discrete phenomenon of interest is a chiefly Positivistic goal. As stated earlier, it is unfortunate that many abductive mixed methods and systems dynamics studies may continue to be judged on Positivist criteria, even though they represent a different paradigmatic approach to science (Istavan, 1992; McKelvey, 2004). This article is not only *about* Pragmatic research, but will be approached *through* the Pragmatic research lens, to serve as an extended example. Unlike Positivism, which focuses on separate units (Mirowski, 1989), Pragmatism focuses on interconnections between phenomenon (Barabasi, 2003; Eoyang, 2004); and arguably, to truly understand Pragmatism, one must examine Pragmatism in connection with other worldviews. To examine Pragmatism as a freestanding unit of interest is to misunderstand Pragmatism. The Pragmatic epistemological territory may be relatively unfamiliar to many because many HRD scholar-practitioners have been inducted into a Western, Positivistic, Newtonian view of the scientific process (Draman, 2004; Jayanti, 2011), whereas the differing assumptions of the Pragmatic epistemology lead to an entirely different

paradigm for the scientific process (Istavan, 1992). Instead of leading readers to an experience of culture shock by inducting readers directly into an entirely different worldview without comparison, I prefer to borrow the approach of expert facilitators by scaffolding learning through use of metaphor and comparison with what is already familiar. It has been suggested that the use of *analogy* is important in theory development because it expands our knowledge of the nature of our theories' causal mechanisms so that we can better understand what is new and unknown in terms of what is already familiar (Gibson, 2008; Haig, 2008). I therefore structure this article in terms of a comparison between Pragmatism and the more familiar lenses of Positivism and Postpositivism.

Differences Between Epistemologies

This article will proceed by way of comparison of three epistemologies in terms of four main factors: how they frame the relationship between observer and world, their assumptions about the purpose of models, the questions that they ask, and their approach to logic. These factors are related to the *process* of research. Understanding the difference between research processes may help to illuminate substantive differences between the three epistemologies.

The number of epistemologies which are involved in comparison were selected both for the sake of simplicity, and because these epistemologies are the most dramatically different. Positivism and Postpositivism may be imagined as polar extremes, and Pragmatism exists in the middle ground between the two extremes. Arguably, because these epistemologies differ from one another the most dramatically, they may be the most illustrative, and for our purposes, the most useful for gaining broad understandings. It is hypothesized that the core differences between the epistemologies in their research *process* impacts the way in which desirable research outcomes are conceptualized in boilerplates.

Relationship Between Observer and World

First, the three epistemologies differ in terms of their assumptions about the relationship between observer and world. Although the relationship between observer and world has been discussed at the level of each individual meta-epistemology—in Positivism (Jayanti, 2011; Mirowski, 1989), Pragmatism (Eoyang, 2004), and Postpositivism (Eisner & Peshkin, 1990), no one has yet suggested that the relationship between observer and world is a salient variable which sets epistemologies apart. This variable is arguably essential to delineating the differences between epistemologies. This relationship may be graphically depicted (see Figure 1).

Positivism suggests that the relationship between observer and world is linear, direct, and unmediated—an observer sees the world as it is (Woodside, 2006b). Furthermore, the observer or researcher is assumed to stand outside of the phenomenon of interest, and therefore does not have an impact on what is observed (Burrell &
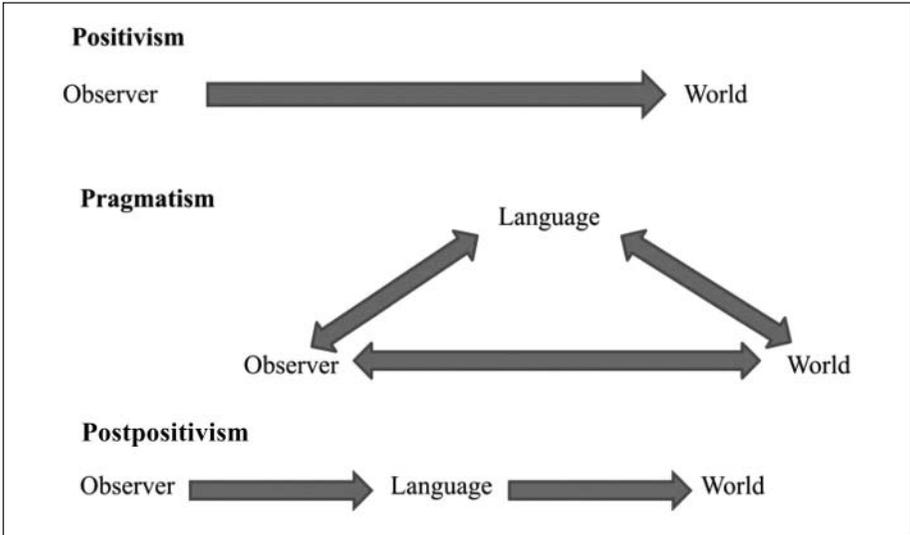
Figure 1. Relationship between observer and world

Morgan, 1979). Laws of nature are supposed to be consistent, understandable, and predictable (Krueger & Casey, 2009). Phenomena are supposed to occur under conditions of equilibrium, and causal elements and observers are supposed to be homogeneous and interchangeable (McKelvey, 2004). As such, multiple observers view the same phenomena in the same way, because reality is objective, and *out there* to be experienced (Maruyama, 1980). The phenomenon of interest is usually a discrete individual unit (Barabasi, 2003). Individual parts are supposed to describe the behavior of a whole.

Positivistic science focuses on the *efficient* cause, or outcomes (McKelvey, 2004). The efficient cause is said to occur when energy perturbations of one kind cause energy perturbations of another kind (McKelvey, 2004). "A" may be said to cause "B," through a linear, direct connection (Lincoln & Lynham, 2011; Woodridge, 2006) and may flow from larger to smaller (Jayanti, 2011). For example, in a corporation, the competitive environment may be said to cause the reactionary behavior of a single company.

Postpositivism suggests that the relationship between observer and world is mediated by language, and that there may be no *objective* outside reality (Eisner & Peshkin, 1990). Language is critical to creating the realm of politics, and the impossibility of separating political power from the process of knowledge production undermines the assumed objectivity of knowledge that is produced (Alvesson & Dietz, 1996). Furthermore, because language stands between the observer and world, context increases in importance. Researchers are assumed to stand *within* the context of interest, and impact the context by their presence, such that the act of observing or measuring a system alters the

system, which is a phenomenon known as the *observer effect* in physics (Bell, 2004; Bornstein, 2009; Suddaby, 2006). To account for the observer's impact on the context, groups become a unit of interest, rather than individuals (Barabasi, 2003).

Although Positivistic science rests only on the *efficient* cause, or the primary source of change, Pragmatic research addresses the four Aristotelian causes: material, formal, final, and efficient (McKelvey, 2004). Material causality suggests that systems emerge from the materials at hand, for example, a company may be made up of its people. A formal cause is a thing's form, for instance, ice may take the form of its mold. A final cause is its aim or purpose. For example, a company may exist to make money, or a company may exist to provide a service (Aristotle, 1960). In short, instead of focusing on *ends*, Postpositivism tends to focus on the *means*.

The Pragmatic epistemology exists in the middle range and attempts to strike a practical balance between the extremes of Positivism—which assumes a direct relationship between observer and world, leading to an objective reality—and Postpositivism—which implies that the relationship between the observer and world is mediated by language, suggesting that there may be no *objective* reality outside of the observer's own experience (Eisner & Peshkin, 1990). Pragmatism assumes that the relationship between observer and world is complex, multidirectional, and interacting (McKelvey, 2004). For instance, in the act of observing reality, both the individual observer's behavior and the behavior of a group being observed may change as a result of the observation process. This phenomenon may be exemplified by the Hawthorne effect, which was named for a factory where productivity kept going up regardless of whether experimenters turned the lights up or down, because employees were affected by the fact that they were being observed and wanted to perform well for the researchers.

Furthermore, although Pragmatic reasoning suggests that the relationship between observer and world is mediated by language and that causality is never unidirectional (Grossing, 2005; Suddaby, 2006), leading to the conclusion that no perception is ever exact, the dialectic between observer and world is not assumed to imply that there is nothing objective outside of the observers. Rather, Pragmatic reasoning suggests that there is an outside reality, but that this outside world is mediated both by the thought and language of an individual observer and the emerging consensus within a community of observers (Lave & Wenger, 1991; Suddaby, 2006). In the Pragmatic view, the interconnection between individuals and groups or communities become the unit of interest (Barabasi, 2003; Eoyang, 2004).

Although Positivism may focus on the *ends* of an action (McKelvey, 2004), and Postpositivism may focus on the *means* of an action, Pragmatism tends to focus on *both* the *means* and the *ends*. For example, if an HRD practitioner focused on the *ends* of an intervention, he or she might care only about its financial outcomes or ROI. If an HRD practitioner focused on the *means* of an intervention, he or she might care only about participants' learning and the humanistic aspects of the intervention. But if an HRD practitioner cares about the *means* and *ends*, he or she balances the humanistic focus with the business focus necessary to making the case for an intervention.

Purpose of Models

Second, each epistemology differs in terms of its assumption about the purpose of models. Positivism has traditionally suggested that the purpose of models is to *predict*, and therefore to *control* (Anderson, 1999; Jayanti, 2011; Lincoln & Lynham, 2011). It is assumed that the researcher has control over the environment, and can document the consequences of their control (Krueger & Casey, 2009). For example, if we are to use scenario planning to model our workplace environment, it is taken for granted that we are doing so because we hope to predict what our future context may look like and to prepare for that future.

However, Postpositivist models suggest that environmental contexts are so complex, and individuals are so unpredictable, that the future cannot be predicted (Guba & Lincoln, 1994). Instead, the purpose of these models is to *describe* and *explain* a given context (Anderson, 1999). Postpositivist models use thick, rich description (Lincoln & Lynham, 2011), but assume that each specific context is unique, and patterns from one environment may be unlikely ever to occur in another context (Cresswell, 2007; McKelvey, 2004).

Pragmatic models—including systems dynamics models—are intended to *anticipate* (Boisot & McKelvey, 2010) rather than to *predict* and *control* systems. Pragmatic models do this alternately by creating microworlds (Woodside, 2006) which model the real world in terms of a specified set of assumptions, searching for patterns (Wheelan & Williams, 2003), or using mixed methods research which actually combines inductive and deductive processes or specifically relies on abduction (Johnson & Onwuegbuzie, 2004; Kiessling & Harvey, 2003). Although it is assumed that the future cannot be *predicted* with any probability, by recognizing patterns that have occurred before under similar conditions, it is hoped that interventions that worked in one context may be somehow adapted to a new context. Yet, systems which may appear similar to one another are not considered to be interchangeable—they differ in terms of their histories, internal politics, and competitive environments or contexts. The role of a professional practitioner in the Pragmatic paradigm is not to simply apply best practices, but to use professional judgment and adapt past practices to current conditions.

Different Questions

Fourth, each of the three meta-epistemological types tends to pose different questions. Berlin (1966) suggested that the key question of Positivism is *knowing that. Knowing that* questions tend to produce answers that are definitional, distinguish between separate phenomena, or explain how many. It has been suggested that *knowing that* questions may be most useful for hypothesis verification (Donmoyer, 1990). Arguably, *knowing that* questions tend to uncover explicit, tangible, transferable information and hard skills, which may be rapidly encoded into work manuals, textbooks, or automated processes. For example, a new employee may read a manual on how to turn a machine on.

The key question of Postpositivism is *knowing how*, or the possession of a disposition or skill, or the experience of direct perceptions, acquaintance, or memory (Berlin, 1966). *Knowing how* questions attempt to understand the world from the perspective of those studied, and is a means of examining and articulating processes (Pratt, 2008). The information uncovered by *knowing how* questions are less explicit or tangible than information uncovered by *knowing that* questions. Apprenticeships and on-the-job training have historically been used to instruct trainees in tacit learning that involves developing *know how*. For example, learning how to actually operate a piece of equipment is likely to require not only explicit knowledge of how to turn the piece of equipment on, but also hand–eye coordination, practice, and professional judgment developed from experience.

The question that Pragmatism asks is *I know* and addresses a specific form of knowledge (Berlin, 1966). For instance, I know what it is to work for this company, or how policies are formed, or what it is to be a line manager. Berlin suggested that this is the type of information that administrators, politicians, and historians need to possess of the men and women with whom they deal. Arguably, this form of knowledge is most useful to HRD practitioners, who stand in solidarity with those whom they serve, and must not know about work and their organization only from an isolated academic standpoint as *knowing that* questions imply, or only practically as *knowing how* questions suggest—as it is likely to be impractical for the HRD practitioner to learn the hands-on details of each of the many job functions that he or she may come in contact with—but to *know about*. Although this third type of question—the *I know* question—has long been neglected, it is most germane. Arguably, in being an applied discipline, HRD is a fundamentally practical, and perhaps even Pragmatic discipline.

Because the different epistemologies pose different questions, they may serve different purposes. Donmoyer (1990) suggested that Positivism is most suited to hypothesis verification, while Postpositivism is most suited to hypothesis generation. Arguably, it logically follows that Pragmatism may be best suited to holistic theory building, which is situated at the intersection of generating and testing hypotheses (Haig, 2008).

Approach to Logic

Fourth, the three epistemologies differ in terms of their approach to reasoning or logic. Deduction and induction have been the central approaches to logic in Western research traditions (Kovacs & Spens, 2005). Yet abduction may be the logical process most amenable to developing new insights (Dew, 2007; Kolko, 2010; Kovacs & Spens, 2005).

Positivism relies on deductive reasoning (Browaeys & Baets, 2003; Meyer, Gaba, & Colwell, 2005). Deductive reasoning's conclusions follow from premises, moving from a general law to a specific case (Danermark, 2001; Dew, 2007). Yet, although a deductive reasoning approach is suitable for testing theories, it is not well suited to creating new ones (Arlbjorn & Halldorsson, 2002; Donmoyer, 1990). An example of

a deductive argument might go as follows: all companies have logos, this is a company, therefore it has a logo.

Postpositivism relies on the inductive reasoning process (Suddaby, 2006). Inductive reasoning moves from a specific case or collection of observations to a general theory or from facts to theory (Andreewsky & Bourcier, 2000; Eisenhardt, 1989). For example, inductive reasoning would suggest the following: these organizations are all companies, they all have logos, therefore all companies probably have a logo.

Pragmatism relies on the abductive reasoning process (Haig, 2008). Abduction is the process of forming an explanatory hypothesis (Lewis & Grimes, 1999; Peirce, 1903). It has been argued that unlike deductive or inductive reasoning, abductive logic allows for the creation of new insight, as it integrates new ideas that may not be a part of the original set of premises (Kolko, 2010), and allows for "inspired guess work" (Dew, 2007). Arguably, of the three logic types, abduction may be most amenable to discontinuous change. It has been suggested that discontinuous change, rather than incremental change, is the type most likely to lead to innovation (Nystrom & Starbuck, 1984; Saviotti & Mani, 1998). Dew (2007) suggested that abductions have three characteristics: *plausibility*, or whether something has face validity, *defeasibility*, or whether the propositions are worthy of further consideration, and *presumption*, or whether the abductions can be assumed to be true. For example, abductive reasoning would suggest: all companies have logos, this organization has a logo, therefore this organization might be a company.

The type of reasoning or logic that is taken to make or support an argument also has larger implications for the theory-building approach that is used (see Figure 2). Arguably, the type of logic used shapes the method of theory building, how the process of theory building proceeds, and what forms of evidence are accepted. Because of these differences, different outcomes or outputs may logically be expected.

The Positivistic theory-building process uses a deductive reasoning approach. As stated earlier, the deductive reasoning approach begins with a general law and finds a specific case (Danermark, 2001; Dew, 2007). Hypotheses are ruled out through the process of deduction, and presumed to be true until proven otherwise (Lynham, 2002). One flaw with this theory-building process is the potential for researchers to pass over many specific cases that contradict the general law in the process of finding a rare case which confirms the law, leading to a tendency toward *confirmation bias* (Maubossin, 2009).

Postpositivism follows an inductive reasoning process for theory building (Charmaz, 2006). Inductive reasoning begins with observation (Eisenhardt, 1989; Miles & Huberman, 1994; Yin, 1984). Once a number of observations are collected, a pattern might emerge. A tentative finding might be formed based on the pattern observed. As the finding is further abstracted, a theory may be discovered (Glaser & Strauss, 1967).

Little has been done in the way of using the abductive reasoning approach specifically for theory building. Although a mixed-method theory-building process (Johnson & Onwuegbuzie, 2004) and an inductive top–down reasoning process have been proposed (Shepherd & Sutcliffe, 2011), no specifically abductive theory-building process has yet been proposed. This is significant, as a broader abductive theory-building
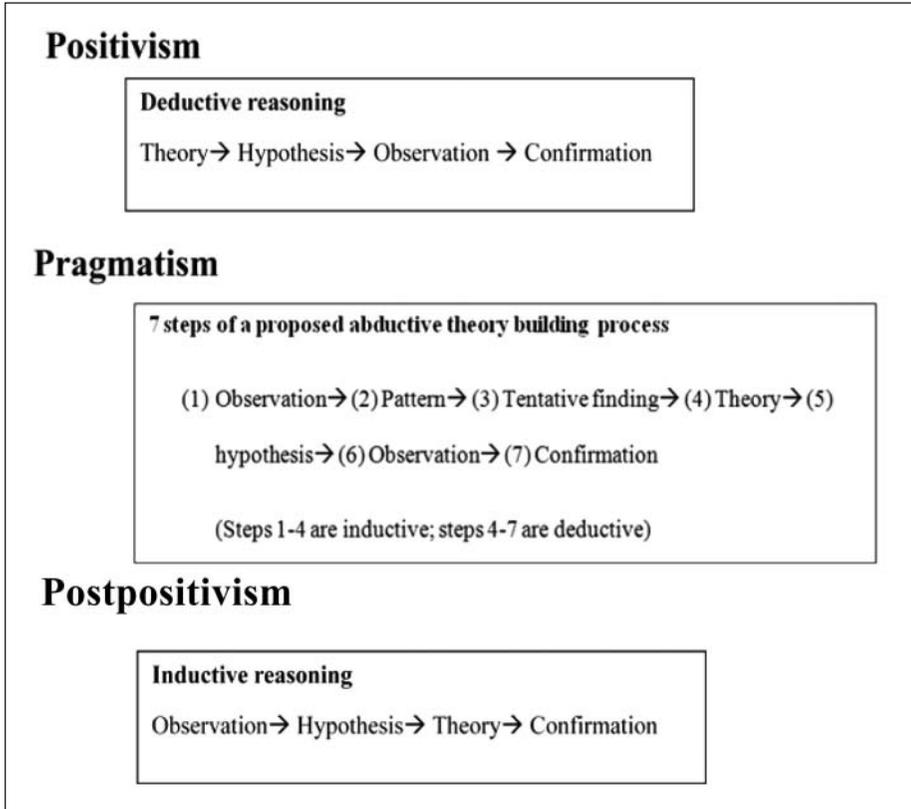
Figure 2. Reasoning process related to theory building

process could be used not only for mixed-methods research, but also more broadly for complex adaptive systems and other emerging approaches to complexity research such as phenomeno-semantic complexity (Erikkson, 2007) and heterogeneous agent-based computational modeling (McKelvey, 2004).

Although there are potentially several ways to operationalize an abductive theory-building process, including developing analogical models by finding a similar theory from an external paradigm and structuring the new model in a similar manner (Haig, 2008), or building causal maps which stakeholders can review and revise, from which microworld simulations may be subsequently built (Woodside, 2006), I believe that one of the easiest ways to operationalize the abductive approach is simply to combine the inductive and deductive approaches. More specifically, I believe that an effective abductive theory-building process may begin by using induction borrowed from Strauss and Corbin's inductive process. Although there are two dominant, and very useful, approaches to inductive theory building, Strauss and Corbin's model (Corbin & Strauss,

1990; Strauss & Corbin, 1990) provides greater structure and clarity in terms of offering a rigid step-by-step process which may better match the largely postpositivistic milieu of the field of HRD, rather than Glaser's less structured, and more constructivistic approach (Cresswell, 2007; Fendt & Sachs, 2008; Glaser, 1992; Suddaby, 2006).

Strauss and Corbin's (1990) model proposes that induction proceeds through the following process:

1. Begin with open coding, organizing data into major categories
2. From this coding, axial coding emerges in which the research identifies one open coding category on which to focus
3. The researcher prescribes types of categories which surround the core phenomenon (i.e., causal conditions, strategies, intervening conditions, consequences) and puts it in a visual model

Second, I propose that abductive theory building not stop with induction, but proceed through abduction by applying a deductive reasoning approach. An initial model produced through induction may next be coded into quantitative terms, and tested using a more classical deductive reasoning approach, exemplified by Dubin's theory-building process (Dubin, 1976; Lynham, 2002).

4. Make deductions about the model in operation
5. Test propositions of the model
6. Convert each proposition whose test is sought into an empirical indicator of the term
7. Substitute the appropriate empirical indicators in the propositional statement to generate a testable hypothesis, which may be tested against a data set. At this point, patterns may or may not emerge.

Since inductive theory building is usually used for developing a theory, whereas deductive reasoning is often used to test a theory (Donmoyer, 1990), combining these two processes into a single process may logically be used to develop and test a single theory. Although Positivism has generally advocated splitting the development and testing of theories into two parts, part of the theory–practice gap (Short, 2006) in HRD may be due to this split in the production and testing of research. By reintegrating two halves of the theory-building processes, it may be hoped that more practically applicable research could be produced.

Boilerplates

Because the three epistemologies differ in terms of four key factors—namely, how they frame the relationship between observer and world, the purpose of models, the questions that they ask, and their approach to logic—it logically follows that research emerging from each of the three epistemologies should differ in terms of their outcomes,

or *boilerplates*. To retain comparability between the three epistemologies, I elected seven criteria to define each epistemology. For Positivism and Postpositivism, these criteria were defined by others as being good criteria. For Pragmatism, the criteria were elected from exemplary definitions of what Pragmatism, systems dynamics, mixed methods, or other related research processes are. Although there are likely to be criteria for research quality which are common to all forms of research—Positivist, Pragmatic, and Postpositivist—to avoid confusion by readers, I have selected to focus more narrowly on what is specific and unique to each form of research, when selecting seven criteria to represent each boilerplate.

Each boilerplate list has been structured in terms of bullet points, rather than by using extended examples, both to be concise, and to allow researchers and reviewers to immediately apply the boilerplate. I envision that researchers reviewing a particular piece of research might be able to use the boilerplates as a sort of a job aide, reading a piece of research, and cross-checking the research with the bullet points like a checklist to determine which set of standards it might be best by which to judge the quality of a particular piece of research. In this way, I hope that this research may be made more active and its impact made more immediate. As research methods become more complex and innovative, having simple aides may be increasingly helpful.

As the complexity of workplaces today far exceeds the ability of any one form of research to capture its reality, each epistemology has its place in helping to advance research in the field of HRD. Yet while boilerplates are relatively established for Positivism and Postpositivism (see boilerplates summarized as bulleted items below), no research boilerplate has yet been proposed for Pragmatic research. For a discipline like HRD to lack criteria on which to judge mid-range Pragmatic research is to close the door on an entire way of thinking about the world and perhaps to close itself off to research done for an entirely different purpose. Therefore, I have gathered a set of definitions of Pragmatic research proposed by other authors, suggest that these definitions be held up as *criteria*, and suggest that this set of criteria may be used as an interim measure by which to judge the quality of Pragmatic research.

Positivistic Research Boilerplate

Although there exist a range of criteria on which scholars and practitioners judge the soundness of Positivistic research, the range is a relatively narrow one, representing substantial agreement. Indeed, Positivism, having been established for the longest time period has the most well-defined criteria. This may reflect the lengthy time period which Positivism has had in which to germinate, since time affords opportunity to critique, evaluate, and dispute—processes that may ultimately lead to consensus (Guba, 1990). In general, Positivistic research:

- Separates the context of discovery from the context of justification and design from implementation (Guba, 1990)

- Is parsimonious and can be described in a brief space, often utilizing mathematical syntax (Boisot & McKelvey, 2010)
- Is assumed to be free from personal biases and as objective as possible (Guba, 1990)
- Is discrete and cannot be described by another theory (Brookfield, 1992)
- Tends to look at discrete individual units (Barabasi, 2003) such as individuals
- Is presumed to be replicable by others in other contexts (Cresswell, 2007)
- Relies on deductive logic (Browaeys & Baets, 2003; Meyer et al., 2005)

The agreement upon Positivistic criteria, and even dominance of these criteria, are reflected in the journals of many research and practitioner communities; however, it is unfortunate that research not adhering to Positivistic logic is often judged by Positivistic criteria (Pratt, 2008).

Postpositivistic Research Boilerplate

There exists a wide range of opinions among scholars and practitioners as to what criteria makes for good Postpositivistic research, perhaps reflecting the variety of voices and languages that mediate the relationship between observer and world. These criteria range from interpreting Postmodernist criteria as highly similar to Positivistic criteria (Lincoln & Guba, 1985) to viewing research as a lens for activism (Roman & Apple, 1990). Nevertheless, it may generally be stated that good Postpositivistic research:

- Uses thick description and has insightfulness (Charmaz, 2006; Lincoln & Lynham, 2011)
- Is linguistically accessible to a broad audience (Roman & Apple, 1990)
- Displays a mutuality of concepts and descriptive logic—that is, the descriptive and explanatory framework (concepts, logic, and propositions) are made clear (Lincoln & Lynham, 2011; Pratt, 2008)
- Draws conclusions that are verifiable (Krueger & Casey, 2009), and that can be supported by the data (Lincoln & Guba , 1985) or by knowledgeable others (Eisner, 1994)
- Uses a process of inquiry that is systematic (Krueger & Casey, 2009)
- Tends to focus on groups rather than individuals (Barabasi, 2003)
- Uses inductive logic (Suddaby, 2006)

Proposed Pragmatic Research Boilerplate

As there has not yet been a discussion of developing a set of research criteria for the Pragmatic research lens, I have assembled the following set of criteria based on definitions that other researchers have provided about Pragmatic or systems dynamics research. Although these criteria were not described by the original authors as *criteria* for judging the quality of research, I believe that these definitions are exemplary, useful,

and helpful in delineating Pragmatic research from other approaches. I therefore propose that these definitions be elevated and held up as *criteria* for judging the quality of Pragmatic research.

The following list, collected and organized into a *boilerplate*, is only meant to elicit a discussion; none of these criteria are definitive, and the list is in no way meant to be exhaustive. Doubtless, the list would be enriched by additional perspectives and debate. It is hoped that by the formation of an initial set of Pragmatic criteria, that scholars and practitioners may be encouraged to venture into Pragmatic research projects, reviewers might become more comfortable with the Pragmatic lens and encouraged to review such research on its own terms, rather than in Positivistic terms, and further, that the field of HRD might be enriched by the additional voices entering the professional conversation. In general, quality abductive research:

- Uses abductive logic (Haig, 2008) and allows for the creativity of the abductive process and discontinuity of insight (Dew, 2007), rather than requiring extensive description of literature search and logic approach which is commonly a feature of quality Postpositivistic research (Lincoln & Lynham, 2011; Pratt, 2008), and may inadvertently reward incrementalism rather than discontinuous change
- Examines interconnections between units, rather than the discrete units themselves (Barabasi, 2003; Eoyang, 2004)
- Integrates the theory-generation and theory-testing processes (Haig, 2008)
- Pairs description with images (Mandelbrot & Hudson, 2006)
- Produces outputs which may take the form of patterns (Wheelan & Williams, 2003), microworlds (Woodside, 2006), computational models (McKelvey, 2004), or mixed-method outputs (Cresswell, 2009; Fielding, 2010) to the extent that these mixed-methods designs actually combine deductive and inductive reasoning approaches or use a specifically abductive approach, rather than relying solely on deductive or inductive reasoning (thus being more properly evaluated by Positivist or Postpositivist boilerplates)
- Uses analogy to aid understanding (Gibson, 2008; Haig, 2008), as a thing may not be understood in terms of itself, but in terms of its connection with other things
- Exhibits a dual focus on both the *means* and *ends* (McKelvey, 2004)

Summary and Conclusion

This article proceeded by way of analogy, contrasting the differences between Positivist and Postpositivist epistemologies to arrive at a better understanding of the Pragmatic epistemology. First, this article highlighted the substantive differences between the three maximally different epistemologies in terms of four factors: how they frame the relationship between observer and world, what they presume to be the purpose of models, the differing questions that they ask, and their approach to logic. These epistemologies differ in several aspects, which are summarized in Table 1 (See Table 1).

Table 1. Comparison of Epistemologies

	Positivism	Pragmatism	Postpositivism
Type of reasoning	Deduction	Abduction	Induction
Location of observer	Outside phenomenon of interest	Within phenomenon of interest	Within phenomenon of interest
Unit of interest	Individuals	Interconnections between individuals and groups	Groups
Research should	Be parsimonious	Seek patterns or simulations	Use thick, rich description
Relationships between observer and world	Linear, direct	Complex, interacting	Nonlinear
Asks questions	"Knowing that" questions	"I know" questions	"Know how" questions
Purpose of models	Predict and control	Anticipate	Describe

Next, a specifically abductive theory-building process was proposed for use in the field of HRD. This theory-building process contrasted with deductive and inductive theory-building processes that are familiar yet combined the strengths of each method. As deductive reasoning is frequently used to test theories, and inductive reasoning is often used to develop them, the combination of both methods was logically needed to develop a more holistic theory-building process for the developing and testing of models.

Finally, possible criteria for judging Pragmatic research were proposed. As Pragmatism is an emerging perspective, much Pragmatic research—including complex adaptive systems research— may be rejected on the basis of its nonconformity to dominant Positivist or Postpositivist standards. By better defining research criteria on which Pragmatic research may be judged, and by being clear about what criteria may be appropriate, more informed judgments about Pragmatic research may be made, and more high-quality Pragmatic research may find its way into publications and practice. Because all research perspectives enrich the body of research as a whole, by promoting the establishment of research criteria for one lens, the entire body of HRD research should be enriched by the expansion of perspectives.

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References

Alvesson, M., & Deetz, S. (1996). Critical theory and postmodernism approaches to organizational studies. In S. R. Clegg, C. Hardy, & W. R. Nord (Eds.), *Handbook of organization studies* (pp. 191-217). Thousand Oaks, CA: SAGE.

Anderson, P. (1999). Complexity theory and organization science. *Organization Science, 10*, 216-232.

Andreewsky, E., & Bourcier, D. (2000). Abduction in language interpretation and law making. *Kybernetes, 29*, 836-845.

Aristotle. (1960). *Physics.* (W. D. Ross, Trans.). Oxford, UK: Clarendon.

Arlbjorn, J. S., & Halldorsson, A. (2002). Logistics knowledge creation: Reflections on content, context, and processes. *International Journal of Physical Distribution and Logistics Management, 32*(1), 22-40.

Barabasi, A. (2003). *Linked: How everything is connected to everything else and what it means*. New York, NY: Plume.

Bell, J. S. (2004). *Speakable and unspeakable in quantum mechanics* (2nd ed.). Cambridge, UK: Cambridge UP.

Berlin, I. (1966). The concept of scientific history. In W. Dray (Ed.), *Philosophical analysis and history* (pp.5-53). New York, NY: Harper & Row.

Boisot, M., & McKelvey, B. (2010). Integrating modernist and postmodernist perspectives on organizations: A complexity science bridge. *Academy of Management Review, 35*, 415-433.

Bornstein, R.F. (2009). Heisenberg, Kandinsky, and the heteromethod convergence problem: Lessons from within and beyond psychology. *Journal of Personality Assessment, 91*(1), 1-18. doi:10.1080/00223890802483235

Brookfield, S. (1992). Developing criteria for formal theory building in adult education. *Adult Education Quarterly, 42*, 79-93.

Browaeys, M., & Baets, W. (2003). Cultural complexity: A new epistemological perspective. *Learning Organization, 10*, 332-339.

Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis: Elements of the sociology of corporate life*. London, UK: Heinemann.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis.* Thousand Oaks, CA: SAGE.

Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology, 13*(1), 3-21.

Cresswell, J. W. (2007). *Qualitative inquiry and research design.* Thousand Oaks, CA: SAGE.

Cresswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: SAGE.

Danermark, B. (2001). *Explaining society: An introduction to critical realism in the social sciences.* Florence, KY: Routledge.

Dew, N. (2007). Abduction: A precondition for the intelligent design of strategy. *Journal of Business Strategy, 28*(4), 38-45. doi:10.1108/02756660710760935

Donmoyer, R. (1990). Generalizability and the single-case study. In E. W. Eisner & A. Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate* (pp. 175-200). New York, NY: Teachers College Press.

Draman, R. H. (2004). Organization/business, management, people, and complexity—an approach to their integration. *Human Systems Management, 23*(2), 101-110.

Dubin, R. (1976). Theory building in applied areas. In M.D. Dunnette (Ed.), *Handbook of Industrial and Organizational Psychology* (pp. 17-39). Chicago, IL: Rand McNally College Publishing.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*, 532-550.

Eisner, E. W. (1994). *Cognition and curriculum reconsidered.* New York, NY: Teachers College Press.

Eisner, E. W., & Peshkin, A. (Eds.). (1990). *Qualitative inquiry in education: The continuing debate.* New York, NY: Teachers College Press.

Eoyang, G. H. (2004). The practitioner's landscape. *Emergence: Complexity and Organization, 6*(1-2), 55-60.

Erikkson, D. M. (2007). Phenomeno-semantic complexity: A proposal for an alternative notion of complexity as a foundation for the management of complexity in human affairs. *Emergence: Complexity and Organization, 9*(1-2), 11-21.

Fendt, J., & Sachs, W. (2007). Grounded theory method in management research: User's perspectives. *Organizational Research Methods, 11*, 430-455. doi:10.1177/1094428106297812

Fielding, N. (2010). Mixed methods research in the real world. *International Journal of Social Research Methodology, 13*(2), 127-138. doi:10.1080/13645570902996186

Gibson, K. (2008). Analogy in scientific argumentation. *Technical Communication Quarterly, 17*, 209-219. doi:10.1080/10572250701878868

Glaser, B. G. (1992). *Basics of grounded theory analysis.* Mill Valley, CA: Sociology.

Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago, IL: Aldine.

Grossing, G. (2005). Observing quantum physics. *Kybernetes, 34*(1/2), 222-240. doi:10.1108/03684920510575816

Guba, E. G. (1990). Subjectivity and objectivity. In E. W. Eisner & A. Peshkin (Eds.), *Qualitative inquiry in education: The continuing debate* (pp. 74-91). New York, NY: Teachers College Press.

Haig, B. D. (2008). An abductive perspective on theory construction. *Journal of Theory Construction and Testing, 12*(1), 7-10.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105-117). London: SAGE.

Harkema, S. J. M. (2003). A complex adaptive perspective on learning within innovation projects. *Learning Organization, 10*, 340-346.

Holland, J. H. (1998). *Emergence: From chaos to order.* Oxford, UK: Oxford UP.

Istavan, R. L. (1992). A new productivity paradigm for competitive advantage. *Strategic Management Journal, 13*, 525-537.

Jayanti, E. B. (2011). *Human Resource Development Review, 10*(1_, 101-114. DOI: 10.1177/1534484310386753

Johnson, R. B., & Onwugbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Education Researcher, 33*(7), 15-26.

Kiessling, T., & Harvey, M. (2005). Strategic global human resource management research in the twenty-first century: An endorsement of the mixed method research methodology. *International Journal of Human Resource Management, 16*(1), 22-45. doi:10.1080/0958519042000295939

Kolko, J. (2010). Abductive thinking and sensemaking: The drivers of design synthesis. *Design Issues, 26*(1), 15-27.

Kovacs, G., & Spens, K. M. (2005). Abductive reasoning in logistics research. *International Journal of Distribution and Logistics Management, 35*(2), 132-144. doi:10.1108/09600030510590318

Kruger, R. A., & Casey, M. (2009). *Focus groups: A practical guide for applied research* (4th ed.). Los Angeles, CA: SAGE.

Kuhn, T. S. (1970). *The structure of scientific revolutions*. (2nd ed.). Chicago, IL: Chicago UP.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation.* New York, NY: Cambridge UP.

Lewis, M. W., & Grimes, A. J. (1999). Metatriangulation: Building theory from multiple paradigms. *Academy of Management Review, 24*, 672-690.

Lincoln, Y. S., & Guba, E.,G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: SAGE.

Lincoln, Y. S., & Lynham, S. A. (2011). Criteria for assessing theory in human resource development from an interpretive perspective. *Human Resource Development International, 14*(1), 3-22. doi:10.1080/13678868.2011.542895

Lynham, S. A. (2002). Quantitative research and theory building: Dubin's method. *Advances in Developing Human Resources, 4*, 242-276. doi:10.1177/15222302004003003

Mandelbrot, B., & Hudson, R. L. (2006). *The (mis)behavior of markets: A fractal view of financial turbulence.* New York, NY: Basic Books.

Maruyama, M. (1980). Mindscapes and science theories. *Current Anthropology, 21*, 589-608.

Maubossin, M. J. (2009). *Think twice: Harnessing the power of counterintuition.* Boston, MA: Harvard Business Press.

McKelvey, B. (2004). Toward a complexity science of entrepreneurship. *Journal of Business Venturing, 19*, 313-341.doi:10.1016/S0883-9026(03)00034-X

Meyer, A. D., Gaba, V., & Colwell, K. A. (2005). Organizing far from equilibrium: Nonlinear change in organizational fields. *Organization Science, 16*, 456-473.

Mikulecky, D. C. (2010). An new approach to a theory of management: Manage the real complex system, not its model. In S. E. Wallis (Ed.), *Cybernetics and systems theory in management: Tools, views, and advancements.* Hershey, PA: Information Science Reference.

Miles, M. B., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: SAGE.

Mirowski, P. (1989). *More heat than light: Economics as social physics-Physics as nature's economics*. Cambridge, UK: Cambridge UP.

Nystrom, P. C., & Starbuck, W. H. (1984). To avoid organizational crises, unlearn. *Organizational Dynamics, 12*, 53-65.

Peirce, C. S. (1903). *The essential Peirce: Selected philosophical writings* (Vol. 2). Bloomington: Indiana University Press.

Poggi, G. (1965). A main theme of contemporary sociological analysis: Its achievements and limitations. *British Journal of Sociology, 16*, 283-294.

Potocan, V., Mulej, M., & Kajzer, S. (2006). Business cybernetics: A provocative suggestion. *Kybernetes, 34*, 1496-1516. doi:10.1108/03684920510614786

Pratt, M. G. (2008). Fitting oval pegs into round holes: Tensions in evaluating and publishing qualitative research in top-tier North American Journals. *Organizational Research Methods, 11*, 481-509. doi:10.1177/1094428107303349

Putnik, G. D., & Van Eijnatten, F. M. (2004). Chaordic systems thinking for learning organizations: Reflections and some suggestions for use. *Learning Organization, 11*, 491-494. doi:10.1108/09696470410548845

Robertson, D. A. (2004). The complexity of the corporation. *Human Systems Management, 23*, 71-78.

Ruona, W. E. A., & Lynham, S. A. (2004). A philosophical framework for thought and practice in human resource development. *Human Resource Development International, 7*, 151-164. doi:10.1080/13678860310001630665

Saviotti, P. P., & Mani, G. S. (1998). Technological evolution, self-organization, and knowledge. *Journal of High Technology Management Research, 9*, 255-270.

Shepherd, D. A., & Sutcliffe, K. M. (2011). Inductive top-down theorizing: A source of new theories of organization. *Academy of Management Review, 36*, 361-380.

Short, D. C. (2006). Closing the gap between research and practice in HRD. *Human Resource Development Quarterly, 17*, 343-350. doi:10.1002/hrdq.1178

Stacey, R. D. (2003). Learning as an activity of interdependent people. *Learning Organization, 10*, 325-331.

Stevenson, B. W., & Hamilton, M. (2001). How does complexity inform community, how does community inform complexity? *Emergence, 3*(2), 57-77.

Strauss, A., & Corbin, J. (1990). *Basics of grounded theory methods.* Beverly Hills, CA: SAGE.

Suddaby, R. (2006). What grounded theory is not. *Academy of Management Journal, 49*, 633-642.

Swanson, R. A. (1995). Human resource development: Performance is key. *Human Resource Development Quarterly, 6*, 207-213.

Wheelan, S. A., & Williams, T. (2003). Mapping dynamic interaction patterns in work groups. *Small Group Research, 34,* 443-467. doi:10.1177/1046496403254043

Woodside, A. (2006). Advancing systems thinking and building microworlds in business and industrial marketing. *Journal of Business and Industrial Marketing, 21*(1), 24-29. doi:10.1108/08858620610643148

Yin, R. (1984). *Case study research.* Beverly Hills, CA: SAGE.

Bio

Elizabeth Bechtel Jayanti is a Ph.D. student in the department of Organizational Leadership, Policy, and Development at the University of Minnesota. She is a Training and Development intern at St. Jude Medical. Her research interests include theory of HRD, complexity, and organizational learning.