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Event- and outcome-driven explanations of entrepreneurship

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Abstract

Aldrich [J. Manag. Inq. 10 (2001) 115] importantly points out that not all forms of process research are equal or the same. He emphasizes the need to distinguish between outcome-driven and event-driven research. We build upon Aldrich's distinctions, arguing that event-driven and outcome-driven explanations represent different kinds of process and variance theories that are based on fundamentally different ontological assumptions. We examine and compare these variance and process theory assumptions in order to sharpen our understanding of process theory as distinct and not derivable from variance theory. We conclude by arguing that variance and process theories must be evaluated on their own items.

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1. Introduction

Howard Aldrich has made significant contributions to understanding processes of entrepreneurship¹ and organizational change from an evolutionary theory perspective. He has been a steadfast advocate for process-oriented theorizing and research in order to better understand dynamic organizational processes. Aldrich (2001) importantly points out that not all forms of

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¹ Following Aldrich (1992), Davidsson and Wiklund (2001), Low and MacMillan (1988), Van de Ven (1992a), and Venkataraman (1997), we define entrepreneurship as new business creation in any organizational form or context, such as new start-ups, internal corporate venturing, and joint interorganizational ventures.

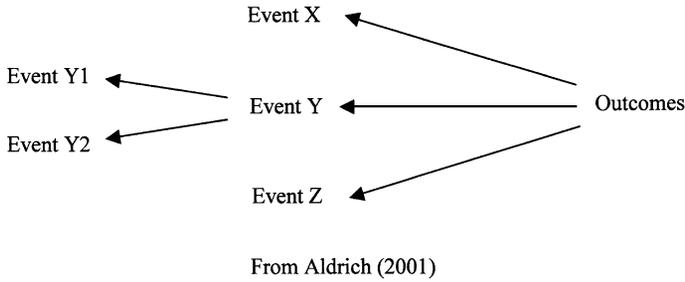


Fig. 1. Outcome-driven explanations.

process research are equal or the same. He emphasizes the need to distinguish between outcome-driven and event-driven research as follows:

Outcome-driven explanations are built backward, from an awareness of observed outcomes to prior causally significant events. Two related problems are introduced with his strategy. First, it often leads to investigators’ selecting on the dependent variable, a well-known research bias. Second, even though we might include all organizations—those that have experienced the event and those that have not—we still observe them at only one point in time. Fig. 1 gives a graphic example of an outcome observed at Time 1 that is then linked backward to events occurring earlier (Aldrich, 2001, p. 118).

In contrast to outcome-driven explanations, event-driven explanations are built forward, from observed or recorded events to outcomes. Researchers pick certain kinds of events a priori and then record their occurrences over time. No simple rules exist for such designs, and some events can figure in more than one narrative. Moreover, most events we observe probably have no obvious consequences, thus requiring that researchers have strong a priori theoretically grounded notions of the expected causal process. Fig. 2 gives a graphic example of events observed over time, which are then linked forward to outcomes occurring later. Note that later outcomes are themselves events, with subsequent consequences (Aldrich, 2001, p. 119).

Aldrich (2001) notes that researchers often do not make explicit distinctions between event-driven and outcome-driven studies of organizational and entrepreneurial processes. In

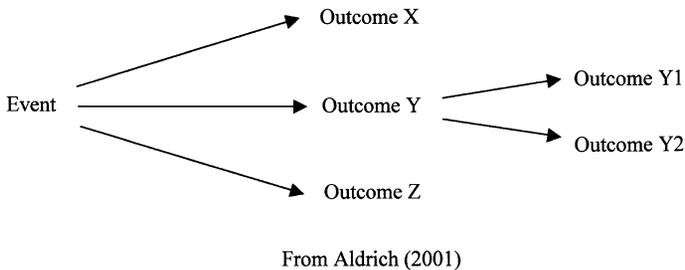


Fig. 2. Event-driven explanations.

addition, two different definitions of “process” are often used in the literature: (1) a category of concepts or variables that pertain to actions and activities and (2) a narrative describing how things develop and change (Van de Ven, 1992b). When the first definition is used, process is typically associated with a “variance theory” (Mohr, 1982) of change, where an outcome-driven explanation examines the degrees to which a set of independent variables statistically explain variations in some outcome criteria (dependent variables). The second meaning of process takes an event-driven approach that is often associated with a “process theory” explanation of the temporal order, and sequence of change events occurs based on a story of historical narrative (Abbott, 1988; Pentland, 1999; Poole et al., 2000). In this usage, the issue of “how change unfolds” is addressed by narrating the temporal sequence of events that unfold in an institutional arrangement.

In entrepreneurship research, an example of outcome-driven research is a study by Schoonhoven et al. (1990). They applied event-history analysis to examine differences in the speed with which new ventures in the U.S. semiconductor industry ship their first products for revenues. Schoonhoven et al. found that organizations that undertook lower levels of technological innovation, that had relatively lower monthly expenditures, whose founding organization structures included both a manufacturing and a marketing position, that had more competitors in the marketplace, and were founded in the Silicon Valley region of the United States shipped their first product for revenues significantly faster than other new ventures.

Gersick (1994) is an example of an event-driven study designed to understand the developmental process among change events. She developed a grounded theory of how a start-up company regulates its development strategy over time. Gersick analyzed key decisions, events, and strategies in this start-up over time based on monthly interviews with start-up leaders and venture capitalists and board meeting observations. Gersick found two forms of temporal pacing that regulate momentum and change in an organization’s strategy. One form of pacing is time based, with reorientations initiated at temporal milestones, the other is event based, with actions initiated when the right event occurred. These two pacing types fostered systematically different patterns of momentum and change in the new start-up.

Aldrich argues that more event-driven process research such as the Gersick (1994) study is needed to develop explanations of entrepreneurial dynamics. Aldrich’s calls for more event-driven process research on entrepreneurship have been echoed by several other researchers including Low and MacMillan (1988), Davidsson and Wiklund (2001), Van de Ven (1992a), and Shane and Venkataraman (2000). Despite such appeals for more event-driven process research, outcome-driven research based on cross-sectional variance methods remains the dominant approach in entrepreneurship research.

According to a review of the entrepreneurship literature by Chandler and Lyon (2001), 80% or 233 of 291 empirical entrepreneurship studies published from 1989 to 1999 in the top-tier academic journals were cross-sectional. Only 20% or 58 of these 291 empirical studies were longitudinal. The majority of these longitudinal studies, 39 of 58, were retrospective case studies in which organizational members were interviewed to reconstruct past situations and events. Only 19 of these 58 studies were truly longitudinal, involving data collection at two or more points in time, real-time case analysis, or multiyear analysis of financial or other data from archival sources. A mere 8 of the 58 longitudinal studies, or 2.7%

of the 291 empirical studies reviewed by Chandler and Lyon (2001), involved analysis of real-time data on entrepreneurial process events.

Why do we see so little event-driven process research in entrepreneurship when so many cite the need to develop better understanding of entrepreneurship processes? Several possible reasons may explain the dominance of outcome-driven methods in entrepreneurship research. Some relate to methodological difficulties in conducting event-driven process research in entrepreneurship. They include inability to access research sites willing to participate in longitudinal field research, inability to access reliable archival documents, and difficulty in identifying new ventures at early stages of development. Some relate to the lack of knowledge in the management research community about process research methods. Doctoral training programs often focus on variance theories and cross-sectional methods with less attention to process theory and event-driven or longitudinal methods. Students and early career faculty are often advised not to do longitudinal research. Lacking training and experience in process theory and methods, subsequent generations of management researchers perpetuate the cycle of continued focus on variance theory and methods.

Poole et al. (2000) point out,

While the variance approach offers good explanations of continuous change driven by deterministic causation, this is a very limited way to conceptualize change and development. It overlooks many critical and interesting aspects of change processes. However, because most organizational scholars have been taught a version of social science that depends on variance methods, and because methods for narrative research are not well developed, researchers tend to conceptualize process problems in variance terms. One can see the ‘law of the hammer’ in operation here: Give a child a hammer, and everything seems made to be hit; give a social scientist variables and the general linear model and everything seems made to be factored, regressed, and fit (p. 29).

Taken together, these factors have culminated in a fundamental lack of understanding in the research community about what constitutes a “good” process theory and a tendency to evaluate process theories in terms of variance theory criteria, hence limiting our progress in developing theories to explain and predict organizational and entrepreneurial dynamics. To partially address this lack of knowledge, we will now examine the distinct assumptions upon which variance and process theories are based. Our discussion relies heavily on Poole et al’s (2000) chapter on process theories and narrative explanation.

2. Process and variance theories

Several scholars have elaborated a distinction between two very different approaches to social science. Mohr (1982) first distinguished variance and process theories in the explanation of organizational behavior. In developing formalism for the representation of social action, Abell (1987) contrasted variance and narrative approaches. Abbott (1984, 1990) compared stochastic and narrative explanations in sociology. Polkinghorne (1988) presents a general introduction to theories of narrative in the human sciences in which he highlights

differences between narrative explanation and traditional social science. Poole et al. (2000) elaborate and discuss narrative process and causal variance theorizing. They point out the different assumptions, implicit or explicit, that scholars make when they adopt each approach to explain organizational change. The common thread running through these works is the difference between scientific explanations cast in terms of independent variables causing changes in a dependent variable, and explanations that tell a narrative story about how a sequence of events unfolds to produce a given outcome. We will refer to these divergent explanations as variance and process explanations, respectively. They constitute the foundation of the variance and process approaches to the study of change and development.

The *variance approach* seeks explanations of continuous change driven by deterministic causation, with independent variables acting upon and causing in dependent variables. Consider an alternative to the variance approach. History conceives of the past in terms of successions of events. Successions are explained by historical process narratives that indicate the significance of the events and the forces—human and otherwise—that influenced them. Whereas some causal forces operate continuously, others influence the sequence of events only at particular points in time (Poole et al., 2000).

For example, Van de Ven et al. (1999) describe the succession of events that led to the forming of Qnetics, a computer software and hardware business. The history of Qnetics includes two independent gestation periods. The first involved the independent parallel events that led two individual entrepreneurs to leave their employing organizations for different reasons in 1979, create their own companies, and recognize limitations in making their independent companies commercially viable businesses. The second gestation period began with the coincidental meeting of the two entrepreneurs through a common acquaintance. Their subsequent interactions led them to recognize potential synergies and opportunities to obtain venture capital support by merging their fledgling companies in November 1983. These gestation events were not planned to initiate a new business in the form that subsequently unfolded. Instead, it is more reasonable to conclude that the events undertaken by the entrepreneurs and their organizations sent them on courses of action that often by chance intersected with the independent courses of others. These intersections provided occasions for interaction, which led the actors to recognize and access new opportunities and potential resources. And where these occasions were exploited, the actors modified and adapted their independent courses of action into independent joint actions and agreements to initiate their new business.

As this example suggests, in addition to continuity and calculus, our theories of change and development must be able to encompass discrete events, qualitative difference, conjunctions, context, intermittent causality, and formative influences. The *process approach* employs narrative explanation to note what the contribution actions and events make to a particular outcome and then configures these parts into a whole episode (Polkinghorne, 1988). This enables researchers to describe and explain both qualitative and quantitative aspects of development and change. Narrative process explanation involves fundamentally different assumptions about the relationships among constructs and the nature of explanation than does variance explanation.

The next section summarizes the different assumptions underlying variance and process theorizing. These assumptions are illustrated in Table 1 and are discussed at greater length in

Table 1
Comparison of variance and process approaches

Variance approach	Process approach
Fixed entities with varying attributes	Entities participate in events and may change over time
Explanations based on necessary and sufficient causality	Explanations based on necessary causality
Explanations based on efficient causality	Explanations based on final, formal, and efficient causality
Generality depends on uniformity across contexts	Generality depends on versatility across cases
Time ordering among independent variables is immaterial	Time ordering of independent events is critical
Emphasis on immediate causation	Explanations are layered and incorporate both immediate and distal causation
Attributes have a single meaning over time	Entities, attributes, and events may change in meaning over time

From Poole et al. (2000).

Poole et al. (2000). We will apply them to entrepreneurship research in order to highlight the distinctive characteristics of event-driven narrative explanations versus outcome-driven variance explanations.

2.1. The variance approach

This perspective explains outcomes as the product of independent variables acting on dependent variables. The underlying causal process that generates the outcomes is presumed to operate continuously over time. Variables are defined and carefully distinguished from one another both in theory and in the operations used to measure them, and the character of the variables themselves is assumed to remain constant over time. Any unexplained variance is assumed to result either from misspecification (the omission of important independent variables or improper specification of relationships among variables) or from random error.

For example, a researcher using a variance approach in studying new business growth might define one dependent variable as the number of customers served per month. The next step would be to define independent variables that influence the number of customers served, for example, customer responsiveness. These variables might be measured at one, two, three, or more points in time, depending on the design. Regardless of when the measurement occurred, the assumption would be that the same thing is being measured, that customer responsiveness, for example, meant the same thing at Time 3 as it did at Time 1. Moreover, although the action of the independent variables on the dependent variable may change in level or degree, there is an assumption that this does not change the character of the dependent variable. Once defined and measured, the meaning of customers served is the same regardless of how much it has been affected by the independent variable, regardless of which independent variable influenced it, and regardless of when it was influenced by the independent variable. This approach regards unexplained variance in clients that served as the result of measurement unreliability, other random errors, and mistakes in the hypothesized causal model.

Poole et al. (2000) discuss seven key assumptions underlying the variance theory approach to the study of change and development:

V1. *The world is made up of fixed entities with varying attributes.* In the variance approach, the basic units of analysis are entities that maintain a unitary identity through time. These entities possess a fixed set of variable attributes that are assumed to reflect any significant changes in the entity (Abbott, 1990). For example, in the study of new business start-ups, the new business is taken as the basic entity. The focus of the research is on characteristics attributes of the business and the process of their initiation, such as whether they have a planning policy board, their structural complexity, and whether and how they involve experts in business design. Changes in these variables represent the essential changes in the new business, and the goal of research is a satisfactory theory representing relationships among these and other variables.

The question of whether the new business per se undergoes a qualitative change over time is not important; the variance approach assumes that any significant changes are captured by the variables. These entities are, in effect, settings within which the variables act. To form a proper explanation, it is necessary to identify the variable attributes that are essential to the process under study. Variables constitute the primitive terms used in theories. Hence, both causes and outcomes of change and development must be framed as variables. Employing this mode of explanation requires one to “variabilize” the world, that is, to view the order underlying observed phenomena as comprised of variables standing in relationship to each other.

V2. *Necessary and sufficient causality is requisite for explanation.* As Mohr (1982) argues, the ideal variance explanation identifies conditions necessary and sufficient for the outcome. The canonical form for such an explanation is a causal account of how the independent variables influence the dependent variable. For example, an individual who initiates a new small business could be causally linked to a set of variables necessary and sufficient to lead to this outcome such as entrepreneurial orientation, access to resources, and a precipitating event such as job loss. In overdetermined cases—that is, when several sets of variables sufficient to bring about the effect can be identified—the ultimate goal of theory and research is to cut through this morass to the few critical factors that are necessary and sufficient conditions for the effect. Hence, parsimony is the final arbiter among competing theories.

V3. *Efficient causality is the basis of explanation.* Aristotle distinguished four causes—literally, *aitia*, “answers to the question” of why change occurs (Aristotle, 1941; Randall, 1960)—material, formal, efficient, and final. Respectively, they indicate that from which something was made (material cause), the pattern by which it is made (formal cause), that from which comes the immediate origin of movement or rest (efficient cause), and the end for which it is made (final cause) (Ross, 1949). The modern scientific enterprise is most explicitly concerned with efficient cause, tending to downplay other sources of change. Mohr (1982) explains, “An efficient cause is a force that is conceived as acting on a unit of analysis (person, organization, and so on) to make it what it is in terms of the outcome variable (morale, effectiveness, and so on) or change it from what it was. It may be thought of as a *push-type* causality” (p. 40). For example, organizational rewards encouraging

innovative behavior, top management team support, and an entrepreneurial climate act on an individual to increase the likelihood that the person will initiate a new corporate venture. Each necessary and sufficient cause in a variance theory is assumed to function in the manner of an efficient cause. Other types of causality, such as final causality that posits that phenomena are influenced by the ends to which they are tending, are now regarded as valid generative mechanisms.

V4. *The generality of explanations depends on their ability to apply uniformly across a broad range of contexts.* One criterion for evaluating variance explanations is their generality. In the variance view, the generality of causal mechanism refers to the domain of cases and contexts in which it is able to operate uniformly and consistently at all levels of both independent and dependent variables. The broader this domain, the more general the explanation provided. Causes are assumed to operate “at equal speed” and in the same way across all cases (Abbott, 1990). The generative mechanism is also assumed continuously efficacious across time; independent variables are always operating on dependent variables in a continuous fashion as the process unfolds. When causal relationships between independent variable and dependent variable is not uniform over cases or time, researchers search for additional variables in the context that may account for the unexplained variance. For example, when relationships between entrepreneur personality variables and new venture performance proved unstable, entrepreneurship researchers began to search for other variables to explain new venture performance.

V5. *The temporal sequence in which independent variables influence the dependent variable is immaterial to the outcome.* When several independent variables are included in a model, the time order in which the variables come into operation makes no difference in the level of the outcome, so long as the theory employs a time frame in which they can all operate or trigger. The level outcome variable Y is the same whether variable X occurs before variable Z or vice versa, so long as their influence is fully brought to bear on Y . This is consistent with the general linear model, which employs linear combinations of independent variables to predict dependent variables. This combinatorial process yields equivalent results no matter which independent variable operates first.

Variables that act in grossly different time frames are commonly separated into two different explanatory theories, distinguished as “macro” and “micro” levels. For instance, variables affecting new business initiation might be partitioned into three sets on the basis of temporal duration—variables that influence individual creativity and innovation in business, variables that influence business planning, and variables that influence initiation and diffusion of business in society. Initially, the focus would be on developing a theory or model for each level, and once this has been accomplished, the interrelationship of the levels is addressed.

A minimal time unit is also assumed. Because many variance models assume causation to operate continuously over time, the existence of variables that require time to be partitioned into bits of definite length presents a thorny conceptual problem (Abbott, 1990; McGrath, 1988). For independent variables to be in continuous operation on a dependent variable, all variables—-independent and dependent, nominal or continuous—must all be susceptible to measurement at the same point in time, and the temporal unit of measurement must be equal

for all variables. Otherwise, variables of different statuses are included in the same model, a logical error. As temporal units grow finer, the model breaks down because eventually, the unit is so fine that at least one variable cannot be realized in the time frame, and measurement becomes impossible.

V6. *Explanations should emphasize immediate causation.* Causal relationships in variance model can be described as “shallow,” because at each point in time, the variables in the model contain all the information needed to estimate their values at the next point in time (Abbott, 1990). The variance approach reduces development and change to a sequential list of the results of a deterministic or stochastic model: “A set of initial values faces the model and produces new values that in turn face the model and so on; the immediate past is perpetually producing the future . . .” (Abbott, 1990, p. 146). The basic assumption of this approach is that extended narratives or accounts involving long sequences of actions are not required for a valid explanation. It is not necessary to know the particular twists and turns of an entity’s history to explain it, because any effects of the past that matter in the present are represented in the immediate past state of the entity. For example, founding team characteristics that matter to new venture performance at Time 3 are assumed predictable from the state of the venture at Time 2. The possibility that unique effects of founding team characteristics could interact with the state of the venture at later points in time in ways unpredictable from previous states is not considered by the variance approach.

V7. *Attributes have one and only one causal meaning over the course of time.* Because variance models operate continuously and uniformly over time, they treat each variable as though it has the same status or meaning throughout the process. A variable such as entrepreneurial orientation is required to have the same meaning and place in the model at Time 100 as it had at Time 1 for the model to be “fittable.” This assumption is a logical result of variance model Assumption 1, in that entities can only remain fixed if the attributes that make them up retain a unitary identity and meaning over the course of time.

2.2. *The process approach*

Given its prevalence, it is easy to presume that the variance approach represents the basic, objective approach of social science. However, as we have seen, variance research is based on a certain way of constructing the object of study, a certain way of cutting up the world into researchable pieces. The variance approach works perfectly well for examining research questions about comparisons among entities or relationships among variables. However, in the study of change and development, its assumptions prove too restrictive. An alternative scientific approach that has been articulated in recent years is much better for addressing process research questions.

As Table 1 illustrates, the narrative approach offers a model of scientific explanation that differs in several ways from the variance model. These differences can be characterized by several assumptions in contrast to those of variance theories:

P1. *The world is made up of entities that participate in events. These entities may change over time as a result.* The unit of analysis in the narrative approach is an evolving central subject that makes events happen and to which events occur (Abbott, 1988). While attributes

of an entity (central subject) may change, the entity itself may also change through a number of processes—through transformation into a different type of entity, merger with another entity, division into two different entities, and death or dissolution. For example, the temporal development of a new business may entail qualitative changes, including being merged with another company, split up, spun-off, or terminated during the course of study. These processes cannot be represented adequately in a set of variables because they have to do with qualitative change in the entity. “Entity processes” (Abbott, 1992) are enacted through sequences of events and can themselves be coded as macro-level events, that is, as discontinuous occurrences that represent qualitative shifts.

While discriminating choice of variables is important in forming variance models, process explanations hinge on discerning essential central subjects and the types of events and characteristics that mark qualitative changes in these subjects. Central subjects are individual entities (people, groups, organizations, machines, and other material artifacts) around which the narrative is woven. It is important to note that the term *subject* does not refer to human subjectivity, but rather to the subject(s) participating in the narrative.

Events are the natural units of the social process; events are what central subjects do or what happens to them. The process perspective explicitly focuses on events rather than variables because of the inherent complexity of developmental processes (Abbott, 1990). The variance approach would regard events as a combination of particular values of many variables. Abbott (1990) states,

The narrative analyst views events as the natural way to simplify the social process. Rather than disassembling complex particulars into combinations of supposedly independent variable properties . . . such an analyst views direct conceptualizing of the observed events as the best way to simplify the complex flow of occurrences” (p. 142).

We might add that the process approach also views events as the most valid representation of what occurs in development and change processes.

P2. *Necessary causality is requisite for explanation.* Process theories focus on critical events and conjunctions of events to explain development and change, and hence they hinge on necessary causality. Each causal event imparts a particular direction and moves the developing subject toward a certain outcome. This influence is necessary for development and change to proceed down a particular path. However, subsequent events, conjunctions, and confluences also influence the subject, and may alter the direction imparted by earlier events. Because causal influences come to bear “event wise”—through one or more events—rather than continuously, no cause can be sufficient in narrative explanation. Only the entire set of forces that influence the developmental span, in the particular order and combination in which they occur, is necessary and sufficient to explain a narrative. An entrepreneur may start a new business, only to discover later that the market has changed and that the initial product is no longer in demand. To maintain a viable business, the entrepreneur must change paths and develop new products to match the new market demand conditions, fundamentally changing the nature of business.

P3. *Final and formal causalities, supplemented by efficient causality, are the basis for explanation.* Narrative explanation employ efficient causality to explain the influence

imparted by particular events and, often, to explain the mechanics of transitions between events and between more macro-level units, such as phases. However, narrative explanation also admits other forms of causality, especially final causality and formal causality. While micromoves from event to event and even some larger transitions are explicable in terms of efficient causes, to explain why larger patterns evolve requires a broader causal scheme. In Mohr's (1982) terminology, narrative explanation requires a "pull-type causality: X (the precursor) does not imply Y (the outcome), but rather Y implies X " (p. 59). In Sarasvathy's (2001) terminology, a pull-type causality relies upon "effectuation" processes that are more general and ubiquitous than causation processes. Final and formal causalities, or effectuation, of new venture performance may occur when the entrepreneur adopts systems and structures expected by venture capitalists such as detailed performance goals. Desire to be seen as a legitimate new business may pull the entrepreneur toward developing goals valued by venture capitalists, which then may pull the entrepreneur toward the set of systems and structures needed to reach these goals.

P4. *The generality of explanations depends on their versatility.* Like variance theories, process theories are evaluated on their potential generality. The generality of a narrative explanation, however, stems not from its uniformity and consistency but from its versatility, the degree to which it can encompass a broad domain of developmental patterns without modification of its essential character. The broader its domain—the greater the variety of cases, contexts, events, and patterns to which the theory can be applied—the more general the explanation. A key difference between process and variance explanations hinges on the use of terms such as "encompass" and "adapt" as opposed to "uniform and consistent operation." These terms capture a basic quality of narrative process explanation, which attempts to discern a common process in a range of complex and seemingly disparate events and sequences.

A defining feature of process narratives is their inherent complexity. The events that comprise them are complicated. Process narratives with the same "plot" often differ considerably in specific sequences due to the particular conjunctions of causes and contextual factors operating in specific cases. Narrative causality is "loose" in that it specifies only the pattern or form that arranges events in space and time; therefore, it does not exert the deterministic influence over events that efficient causes exert in variance theories. Moreover, in process theories, efficient causation is event centered and hence may be intermittent and uneven over time. As a result, narratives explainable in terms of the same theory may vary considerably in the nature and patterns of events that transpire. For instance, a life cycle theory of new venture development may posit a general set of stages through which all new ventures pass, but the exact sequence of stages experienced by a particular new venture or the observed length of time a new venture spends in each stage may vary considerably.

P5. *The temporal sequence of independent variables is critical.* Process approach Assumption 4 implies that the order in which causal forces come to bear is crucial in narrative accounts. The order in which events occur in narratives determines when efficient causes come into play, while the duration of events and the continuity across events determines how long these causes operate. Differences in order can make large differences

in outcomes. Stage-wise models of development posit that differences in order can make large differences in outcomes.

In group decision making, for example, if groups start with solutions, the solution orientation acts to narrow their frame of reference, and later attempts to define the problem will generally be constrained by the frames implied in the solutions first entertained. On the other hand, groups that start with a broad search for understanding the problem are not so constrained and therefore may consider a much wider range of solutions during subsequent solution phases. The order in which the events “solution development” and “problem diagnosis” occur brings different causal forces to bear. In the case of the solution-oriented group, there is a strong framing effect. The problem-oriented group is driven by forces enabling and constraining search behavior, and only later experiences solution-framing effects. The different temporal orderings result in quite different outcomes (Maier, 1970).

P6. *Explanations should incorporate layers of explanation ranging from immediate to distal.* If variance theories are “causally shallow,” process theories are “causally deep” (Abbott, 1988). They explain the state of development at any point in terms of the prior history of events and associated causal influences. In process theories, history cannot be encapsulated in the immediate past state of the entity (as it is in variance theories), because the ordering and context of previous events are critical to narrative explanation. Within the same narrative framework, the particular histories of individual cases may lead them to take different paths to different outcomes. To subsume these differences under a common theory, it is necessary to show how the sequence of events for each case resulted in a unique causal history that caused the narrative to unfold in different ways.

This creates an interesting situation: Whereas a particular cause may operate for only a limited time in a narrative, in a sense it never ceases to influence the entity because it forms part of the entity’s history. A new venture start-up founded to commercialize a technological innovation that is subject to a strict regulatory regime, such as federal approval of a new drug or safety device, bears the influence of this regime long after regulatory requirements have been satisfied. The particular characteristics of the product and its ultimate success or failure are shaped by its history and the measures taken in response to regulation.

P7. *An entity, attribute, or event may change in meaning over time.* As noted before, the process approach presumes that the unit of analysis may undergo metamorphosis over time. So the entity, for example, a new business, may be fundamentally transformed into a different type of unit, merge with another unit, or go out of existence over the course of the narrative. In the same vein, an attribute of the entity may change in essential meaning as the entity develops; what strategic planning is will be fundamentally different for a small start-up than for the larger firm it grows into. Finally, events may also change in meaning for the narrative. The event “denied funding” is likely to mean very different things to a nascent product development team than to the project team that has shepherded an innovation through several years. To a young new venture team, denial of funding is likely to constitute a catastrophe that threatens the very life of the project; to the experienced team, it represents an unfortunate but survivable event and sets in motion plans for obtaining interim funding from “soft” sources. This does not represent different interpretations of the same event but rather fundamentally different meanings for the two events.

3. Discussion

Different research questions require different methodologies. Entrepreneurship studies tend to focus on two general questions:

- What are the antecedents or consequences of entrepreneurship?
- How does the entrepreneurship process unfold over time?

The variance approach is appropriate for the first kind of question; the approach is necessary to address the second kind of question. Although most scholars agree with this conclusion, the fact remains that the vast majority of entrepreneurship research to date has focused on the first question. Moreover, most of the relatively few entrepreneurship researchers who attempt to address the second question do so with the wrong methodology. That is, they employ variance theory methods to study the second question that should be studied using narrative process methods.

We concur with Aldrich in encouraging entrepreneurship scholars to devote more research attention to the second question. The “how” question is concerned with describing and explaining the temporal sequences of events that unfold in the development of entrepreneurial ventures. Process studies are essential for gaining an appreciation of dynamic organization life and developing and testing theories of entrepreneurship dynamics.

Having distinguished between the two general types of questions posed by variance and process theories, it is important to see their complementary relationship. The two types of questions are highly related and both are important for understanding organizational change. To answer the “what” question, one typically assumes or hypothesizes an answer to the “how” question. Whether implicit or explicit, the logic underlying an answer to a variance theory is a process story about how a sequence of events unfolds to cause an independent (input) variable to exert its influence on a dependent (outcome) variable. For example, to say that R&D investment and entrepreneurial orientation causes new corporate venture start-ups is to make important assumptions about the order and sequence in which R&D investment, opportunity recognition, and new venture start-up events unfold in an organization. Thus, one way to significantly improve the robustness of answers to the first (variance theory) question is to explicitly examine the process that is assumed to explain why an independent variable causes a dependent variable. To do so requires opening the proverbial “black box” between inputs and outcomes, and to take the process seriously by examining temporal sequences of events.

By the same token, answers to process research questions tend to be meaningless to their users without an answer to their corresponding variance theory questions. For example, to propose that new start-ups proceed through a general set of life cycle stages but may do so in different sequences begs the question of what factors cause the different sequences observed. One way to improve the answers to process theory questions about how start-ups pass through life cycle stages is to search for start-up characteristics that influence differences in progression through such stages. As Pettigrew (1990) argues, theoretically sound and practically useful research on change should explore the contexts, content, and process of

change through time. Just as change is only perceptible, relative to a state of constancy, an appreciation of a temporal sequence of events requires understanding the starting (input) conditions and ending (outcome) results. In short, answers to both questions are needed to appreciate the inputs, processes, and outcomes of entrepreneurship.

The process and variance approaches emphasize different aspects of change and development. The variance approach captures the continuous variation in development and change with powerful mathematical representations, whereas the process approach includes the role of human agency in change and development. Deriving a variance theory requires the researcher to construct the development and change process in a particular way. This construction emphasizes those aspects of the phenomenon amenable to variabilization and may also require translation of concepts into variable forms. The variance approach portrays the process as driven by continuous efficient causality operating on and through stable entities. Methods used to test variance theory are based on cause–effect relationships between independent and dependent variables. The goal of variance theory methods is to produce context-free generalizations that lead to a reliable and valid prediction, explanation, and understanding of the phenomenon studied.

Developing a process theory requires a very different construction of development and change. The researcher must isolate meaningful elements that lead to the outcome and then derive a narrative process story that ties these elements into a coherent whole. As we move from surface observations of process events toward a process theory, we move from description to explanation. Explanation requires a story, and stories can be understood as process theories (Pentland, 1999). In narrative theory, the story is an abstract conceptual model; it identifies the generative mechanisms at work. At a minimum, this story must describe a progression or sequence of events. In narrative theory, however, the “story” includes a great deal more than just event sequence. In particular, a process theory should include the following features in the story (Pentland, 1999, pp. 712–712):

1. *Sequence in time.* Narratives should include a clear beginning, middle, and end . . . Chronology is a central organizing device. The events or actions referred to in a narrative are understood to happen in a sequence.
2. *Focal actor or actors.* Narratives are always about someone or something . . . There is a protagonist and, frequently, an antagonist as well. The characters may not be developed or even identified by name, but, along with sequence, they provide a thread that ties the events in a narrative together.
3. *Identifiable narrative voice.* A narrative is something that someone tells (Bal, 1985), so there should always be an identifiable voice doing the narrating. That voice reflects a specific point of view (Rimmon-Kenan, 1983).
4. *“Canonical” or evaluative frame of reference.* Narratives carry meaning and cultural value because they encode, implicitly or explicitly, standards against which actions of the characters can be judged . . . But even without any explicit moral, narratives embody a sense of what is right and wrong, appropriate or inappropriate, and so on.
5. *Other indicators of content or context.* Narrative texts typically contain more than just the bare events. In particular, they contain a variety of textual devices that are used to indicate

time, place, attributes of the characters, attributes of the context, and so on. These indicators do not advance the plot, but they provide information that may be essential to the interpretation of the events (e.g., knowing that the scene is a wedding changes the significance of the utterance “I do”).

Because variance and process theories are based upon fundamentally different ontological and epistemological assumptions, we cannot evaluate a process theory based on variance theory assumptions, and vice versa. Each type of theory must be evaluated according to the ontological and epistemological assumptions upon which it is based. Variance theories and methods allow us to explore “what” questions; process theories and methods allow us to explore “how” questions. If we are truly committed to expanding our knowledge of entrepreneurship and other management phenomena using event-driven process approaches, we must establish a research community that appreciates process theories as unique and not derivable from variance theories.

4. Conclusion

Aldrich (2001) cautions us that not all forms of process research are equal or the same. He distinguishes between outcome-driven explanations that start with an outcome and move backward to search for the events that explain that outcome, and event-driven explanations that start with observed events and move forward to outcomes. In this paper, we extend Aldrich’s distinction by arguing that event-driven and outcome-driven explanations represent fundamentally different kinds of process and variance theories based upon fundamentally different ontological and epistemological assumptions.

Of course, Aldrich’s call for more event-driven process research and our argument for understanding the fundamental differences between variance and process theorizing are not limited to entrepreneurship but apply to the social sciences in general. For instance, Bruner (1986) distinguished two basic types of human intelligence: the paradigmatic, logico-scientific mode of thought and the narrative mode of thought. He contrasts them as follows:

There are two modes of cognitive functioning, two modes of thought, each providing distinctive ways of ordering experience, of constructing reality. The two (though complementary) are irreducible to one another. . . . Each of the ways of knowing, moreover, has operating principles of its own and its own criteria of well-formedness. They differ radically in their procedures for verification (Bruner, 1986, p. 11).

Bruner notes that we have relatively little knowledge about how narrative understanding works compared to the vast literature on paradigmatic thinking and its methods. Certainly, recent research in many fields is filling this void, but much remains to be done.

We believe that it is time to develop a process-based social science to complement the variance approach. It is time to exercise more fully, and in a systematic manner, the human ability to understand and to explain through narrative. The process approach has the potential to unlock a different, more fundamental level of understanding temporal processes.

References

- Abbot, A., 1984. Event sequence and event duration: colligation and measurement. *Hist. Methods* 17, 192–204.
- Abbott, A., 1988. Transcending general linear reality. *Sociol. Theory* 6, 375–392.
- Abbott, A., 1990. Conceptions of time and events in social science methods: causal and narrative approaches. *Hist. Methods* 23, 140–150.
- Abbott, A., 1992. The order of professionalization. *Work Occup.* 18, 355–384.
- Abell, P., 1987. *The Syntax of Social Life: The Theory and Method of Comparative Narratives*. Clarendon Press, Oxford.
- Aldrich, H.E., 1992. Methods in our madness? Trends in entrepreneurship research. In: Sexton, D.L., Kasarda, J.D. (Eds.), *The State of the Art Entrepreneurship*. PWS-Kent, Boston.
- Aldrich, H.E., 2001. Who wants to be an evolutionary theorist: remarks on the occasion of the Year 2000 OMT Distinguished Scholarly Career Award Presentation. *J. Manag. Inq.* 10 (2), 115–127.
- Aristotle, 1941. In: McKeon, R. (Ed.), 1941. *The Basic Words of Aristotle*. Random House, New York.
- Bal, M., 1985. *Narratology: Introduction to the Theory of Narrative*. University of Toronto Press, Toronto.
- Bruner, J., 1986. *Actual Minds, Possible Worlds*. Harvard Univ. Press, Cambridge, MA.
- Chandler, G.N., Lyon, D.W., 2001. Issues of research design and construct measurement in entrepreneurship research: the past decade. *Entrep. Theory Pract.* 25 (4), 101–113.
- Davidsson, P., Wiklund, J., 2001. Levels of analysis in entrepreneurship research: current research practice and suggestions for the future. *Entrep. Theory Pract.* 25 (4), 81–99.
- Gersick, C.J.G., 1994. Pacing strategic change: the case of a new venture. *Acad. Manage. J.* 37 (1), 9–45.
- Low, M.B., Macmillan, I.C., 1988. Entrepreneurship: past research and future challenges. *J. Manage.* 14, 139–162.
- Maier, N.R.F., 1970. *Problem Solving in Individuals and Groups*. Brooks/Cole, Monterey, CA.
- McGrath, J.E., 1988. *The Social Psychology of Time*. Guilford, New York.
- Mohr, L., 1982. *Explaining Organizational Behavior*. Jossey-Bass, San Francisco.
- Pentland, B.T., 1999. Building process theory with narrative: from description to explanation. *Acad. Manage. Rev.* 24 (4), 711–724.
- Pettigrew, A.M., 1990. Longitudinal field research on change: theory and practice. *Organ. Sci.* 1, 267–292.
- Polkinghorne, D.E., 1988. *Narrative Knowing and the Human Sciences*. SUNY Press, Albany, NY.
- Poole, M.S., Van de Ven, A.H., Dooley, K., Holmes, M.E., 2000. *Organizational Change and Innovation Process*. Oxford Univ. Press, Oxford, UK.
- Randall Jr, J.H., 1960. *Aristotle*. Columbia Univ. Press, New York.
- Rimmon-Kenan, S., 1983. *Narrative Fiction: Contemporary Poetics*. Routledge, London.
- Ross, D., 1949. *Aristotle*. Methuen, London.
- Sarasvathy, S.D., 2001. Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Acad. Manage. Rev.* 26 (2), 243–263.
- Schoonhoven, C.B., Eisenhardt, K.M., Lyman, K., 1990. Speeding products to market: waiting to time to first product introduction in new firms. *Adm. Sci. Q.* 35 (1), 177–207.
- Shane, S.A., Venkataraman, S., 2000. The promise of entrepreneurship as a field of research. *Acad. Manage. Rev.* 25 (1), 217–226.
- Van de Ven, A.H., 1992a. Longitudinal methods for studying the process of entrepreneurship. In: Sexton, D.L., Kasarda, J.D. (Eds.), *The State of the Art of Entrepreneurship*. PWS-Kent, Boston.
- Van de Ven, A.H., 1992b. Suggestions for studying strategy process: a research note. *Strateg. Manage. J.* 13, 169–188.
- Van de Ven, A.H., Polley, D.E., Garud, R., Venkataraman, S., 1999. *The Innovation Journey*. Oxford Univ. Press, New York.
- Venkataraman, S., 1997. The distinctive domain of entrepreneurship research: an editor's perspective. In: Katz, J.A., Brockhaus, R.H. (Eds.), *Advances in Entrepreneurship, Firm Emergence, and Growth*, vol. 3. JAI, Greenwich, CT.