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Where Ideas Come From: A Systematic View of Inquiry

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Abstract

For the most part, models and theories about idea generation and creativity can be divided into three types: theories about individual characteristics conducive to generating ideas, theories about the contexts in which ideas flourish, and theories about the processes by which ideas are developed. The reductionist nature of the contingency theories and their neglect of intertwined causality limits their usefulness in helping us to understand ideation. People do not come up with ideas in complete isolation, nor do contexts alone determine whether or not ideas will emerge. The process theories disregard the possibility of equifinality-different combinations of contextual and personal characteristics may result in different but equally effective processes. Rather than studying idea generation in terms of lists of categories, continua of characteristics, or details about process, we explore its systemic nature and investigate the inter-relatedness of idea generation, problem solving and inquiry. We propose that Churchman's interpretation of the philosophies of Leibniz, Locke, Kant, Hegel and Singer provides insight into idea generation archetypes that reflect managers' dominant approaches. The analysis of interviews with fifty-two executives demonstrates the utility of this approach and supports a model of creativity based on patterns rather than indicators of behaviour.

Keywords: Inquiry, idea generation, problem solving

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Where Ideas Come From: A Systematic View of Inquiry¹

There is general agreement that an idea is a concept or plan formed by mental effort and that creativity is the mental effort that results in the production of novel and useful ideas² (Newell, Simon & Shaw 1962). But where do ideas come from? And what does it take to increase their frequency and improve their quality? Does it take the perfect confluence of information, experience and luck (Campbell 1960) or are good ideas nothing more than intellectual productivity, the straight forward extension of earlier work (Weisberg 1993)?

Many theories about and models of creativity and idea generation have been put forward. For the most part, they can be divided into three types: theories about personal characteristics conducive to generating ideas, theories about the contexts in which ideas flourish, and theories about the processes by which ideas develop. Theories about contextual and personal characteristics suffer from the shortcomings of all contingency research: they are reductionist in nature. They presuppose that possibly relevant factors affect people with different dispositions and situations in the same way, or that *ceteris paribus* can be created for purposes of testing. In addition, they neglect the intertwined causality of structuration. People do not come up with ideas in complete isolation, nor do contexts alone determine whether or not ideas will emerge. The process theories disregard the possibility of equifinality--different combinations of contextual and personal characteristics may result in different but equally effective processes. Similarly, they disregard the likelihood that the same process with different actors and a different context may have entirely different results.

Over our life times, we create a complex web of understanding based on our genetics and experiences. This web constrains the options open to us and what we are likely to consider next (Kiesler & Sproull 1982). Rather than viewing idea generation as lists of categories, continua of characteristics, or details about process, we chose to describe archetypes consisting of combinations of personal characteristics, processes and the nature of probable outcomes. These archetypes illustrate both the complexity and interrelatedness of idea generation components.

The remainder of this paper describes this point of view and the empirical work we have undertaken to assess its appropriateness and utility. In the next section we describe the archetypes, based on classical philosophy, that we believe help us to understand ideation. Then we review the results of the analysis of fifty-two executive interviews which we undertook to explore the validity of the archetypes. Finally we discuss the implications of our point of view and outline further research in this area.

¹ We would like to thank Richard Boland for his significant contributions to this research.

² In this paper, the notions of creativity and idea generation are used interchangeably.

Ideas, Problems and Information

Idea Generation

The literature on creativity and idea generation is large and diverse. Its essence is that of many models and approaches that neither rival nor complement each other, but seem to overlap and intersect in a patchwork of understanding.

One of the earliest of the process models of creativity is the Wallas (1926) stage model. According to him, there are four steps in the creative process: *preparation*, in which a deficiency or a gap in knowledge is sensed; *incubation*, in which information is acquired, ideas are explored and solutions begin to be formulated; *illumination*, in which there is a flash of insight or the birth of a new idea; and *revision*, in which the options are evaluated and the most promising is selected. The concept of illumination is closely related to a stream of research that attributes creativity to intuition, when reasoning is not part of the process of formulating an idea (Glaser 1995). A third stream of research focuses on Darwinian natural selection. According to Campbell (1960) "a blind-variation-and-selective-retention process is fundamental to all inductive achievements, to all genuine increases in knowledge" (p. 380). His basic premise is that creativity is a process of natural selection whereby random variations are generated and selected on the basis of how well they fit with the problem being solved.

Another widely held view is that the essence of the act of creativity is bisociation-- combining idea elements from two or more entirely unrelated domains (Koestler 1964). Famous examples of bisociation include the development of the telephone, the invention of microprogramming and the invention of the airplane (Dasgupta 1996).

Woodman, Sawyer and Griffin (1993) describe a theory of organizational creativity with the main proposition that "the creative performance of individuals in a complex social setting is a function of salient individual characteristics (biographic background, personality, cognitive factors and knowledge), social influences that enhance or constrain individual creativity (e.g. group norms) and contextual influences that also enhance or constrain individual creativity (e.g., reward structure)" (p. 310).

Voss and Means (1989) and Weisberg (1993) view the creative process as the solving of an ill-structured problem. They do not consider creativity to be any different than other types of thinking, nor do they think that it is a special capability that only some people have. However, they do recognize individual differences in creativity and attribute them to mental functioning of cognitive and affective mechanisms.

It is not possible to reconcile these diverse viewpoints into a holistic theory of creativity and problem solving. Researchers who advocate a particular approach or key to successful idea generation may be describing what works for some people, or what works some of the time, but are unlikely to be describing what works for everyone all the time.

Information and Inquiry

Information, inquiry and knowledge are fundamental to problem solving and creativity. Some believe that effective problem solving in domains that are rich in information depends on possession of deep knowledge or expertise (Prietula & Simon 1989, Dasgupta 1996) and that

engagement in cognitive activities such as problem definition, environmental scanning, data gathering and generation of alternatives is necessary for creative responses to emerge (Shalley 1995). Others believe that ideas require minimal information. People search for and use facts only to support or refute their ideas (Rosak 1986). In fact, Adams (1974) believes that the worst enemy of creativity is too much knowledge about existing solutions.

A third point of view combines the first two by focusing on different requirements for different stages of the process. According to Fiol (1995), both knowledge depth and knowledge breadth are required at different phases of the creative process. Knowledge depth is defined as vertical thinking, fluency, and a constrained problem definition. Knowledge breadth is defined as lateral or metaphorical thinking and an expanded problem definition. Similarly, Saunders and Jones (1990) propose that different information sources and media are required or used at each point in the decision making process.

A final point of view is one of "anything goes." New information can lead to new ideas, but a recombination of old information can also lead to new ideas (DeBono 1967).

O'Reilly et. al (1987) believe that we must understand both how information is acquired and how it is processed in order to understand idea generation and problem solving in organizations. They call for the integration of message flow and decision making research. Antecedents of message flow lead to communication, which leads to antecedents of decision making, which lead to decision making, which leads to consequences. We follow their advice in the development of a systemic view of inquiry.

A Systemic View

The lack of clarity about the role of information and inquiry, and the interrelatedness of idea generation, problem solving and information acquisition point to the systemic nature of our thinking processes. Given the myriad combinations possible, it is not surprising that so many conflicting theories survive. The mind is the result of the interaction of influences that structure thought (Harre & Gillett 1994). It is controlled as much by pleasure, passion, love, morality, beauty, mysticism and curiosity as by reason and logic (Logan 1995). The confluence of our personalities and the contexts we have experienced and in which we find ourselves determines our methods of inquiry. The nature of the inquiry process employed determines the nature and range of the ideas we generate and explore. We change our environments and our environments change us (Giddens 1979, Gadamer 1975).

In this research, we do not presume that there is an ideal process or set of factors that ensures creativity or the generation of good ideas. Instead, we believe that it may be more fruitful to identify different approaches and strategies and to delineate the benefits and drawbacks of each. It is not the purpose of this paper to explain how humans' systems of inquiry emerge, but rather to describe the classical archetypes of inquiry. We illustrate these archetypes with examples of senior managers' approaches to information and thoughts about the sources of their ideas.

Churchman (1971) defines inquiry as the activity which produces knowledge, and knowledge as the ability to adjust behaviour to changing circumstances. In other words, knowledge is the ability to react to and find solutions for the problems we create and encounter.

He looked to the ideas of Locke, Leibniz, Kant, Hegel and Singer to determine how to design a system of inquiry. These philosophers were some of the great thinkers of Western civilization. Inspired by notions of rationality and spirituality, they spent their lives contemplating the essence of thinking. Their introspection and observation provide a believable basis for identifying patterns of problem solving, idea generation and inquiry that we might well expect to see today. We propose that Churchman's interpretation of each of these philosophers provides insight into an inquiry archetype. Focusing on archetypes rather than processes, individual characteristics, and contexts provides a systemic view of problem solving and idea generation. It puts meat on the bones of intelligence, design and choice (Simon 1965).

There is a great deal of support for strong inquiry predispositions. Decision makers are unresponsive to materially significant differences in the quality and cost of information, they display slow or no learning in repeated trials, and different experts use different information in making judgements. In experimental situations, subjects' "way of doing things" tends to overshadow what is considered to be the best way, in spite of clear advice and specific training (Connolly & Thorn 1987).

Many categorizations and continua of personal characteristics have been devised to help us understand the thinking process. Examples include Jungian personality types in which people are situated in four dimensions, two of which are relevant to inquiry and creativity: how individuals perceive or sense the world and how they evaluate or judge it. Kolb's (1984) learning styles are another example of situating people in a two dimensional space to understand how they learn and the kinds of mechanisms that might best support their individual styles. A continuum-based evaluation was developed by Kirton (1976). He believes that "everyone can be located on a continuum ranging from an ability to 'do things better' to an ability to 'do things differently'" (p. 622).

While these categories and continua provide insight into the different ways that humans think, we find that they do not provide enough dimensionality for deep understanding and explanation. In addition, all these schemes rely on self-scoring, so describe espoused preferences rather than actual inclination and behaviours. Nevertheless, it is tempting to use the notions of endpoints and opposites to distinguish the archetypes along various dimensions such as base of knowledge, principle sources of information, principle approaches to incorporating new information, and so forth. We resist in order to avoid the arbitrariness of the end points. In the five descriptions that follow, the focus is on the important characteristics of each archetype, not necessarily how it fits along a continuum.³

Leibniz

Leibnizian inquirers place a great deal of importance on what they already know. They evaluate new information on the basis of how well it fits with their existing mental models. As a consequence, Leibnizians value experience and skill. They link facts together into coherent "fact nets" using chains of reasoning to arrive at a single, internally consistent and usually strongly held point of view. They are uncomfortable with contradiction and always on the lookout for a

³These summaries have been created based on the writings of Churchman (1971) and Boland et al. (1994)

right answer. When information is encountered, it is typically classified according to their pre-existing understanding. Leibnizians typically seek confirmation rather than diverse viewpoints.

Leibnizians are experience-based decision makers. When faced with a decision, they will usually attempt to call on a similar situation for guidance. If they are faced with a new issue that is not similar to their past experiences, they will consult familiar sources for advice and information. Leibnizians also make predictions about future events based on their past experience. Typically, they have spent a great deal of their careers in a particular industry and often with a particular company. Their pride in this accomplishment is manifested by the frequency with which they mention the number of years of relevant experience they have.

Leibnizians are slow to change. For example, if a Leibnizian reads, in a source that he or she deems credible, that inflation is rising, this fact will elicit a reaction consistent with the script for responding to rising inflation. If inconsistent information is received, e.g., inflation is rising, but supplier costs are declining, the Leibnizian will try to reconcile the two. If this is not easily done, the information whose source is perceived as less credible will be discarded.

Leibnizians typically confine their information searches to a fixed number of sources that they have found useful in the past and rarely move beyond that set. For example, they usually prefer regular meetings with the same participants. Leibnizians tend to take control and direct others. They often view themselves as educators, or the most knowledgeable person available and regularly express their strongly held points of view.

What would creativity theorists think of Leibnizians? Most would probably consider them to be unimaginative and bereft of innovative ideas. However, goals and preparation are the Leibnizian's forte. If one concurs with Rosak (1986), Einstein and Infeld (1938), or Hayes (1989), Leibnizians may be the most successful generators of workable, low-risk solutions.

Locke

Lockean inquirers are concerned with consensus. They ask others to generate ideas, but are not usually active generators of ideas. Similarly, they do not actively attempt to change their environment, unless the change creates harmony and unanimity. Rather than checking to see if new information fits within existing understanding, they check for agreement within the relevant community. If there is unanimity, new information is incorporated into their personal understanding. For example, action will be taken on the inflation described above only after verification with others that the conclusion and behaviour are appropriate. Information is used only when it is deemed appropriate by the group, and the search for information is limited to those sources that the group has approved of. Woodman *et al.* (1993) and Amabile (1988) seem to be concerned with Lockeans in their descriptions of the importance of social and contextual influences to the creative process.

Creativity theorists would probably consider Lockeans to suffer so excessively from groupthink that they would be unlikely to generate good ideas. Nevertheless, their focus on consensus will probably lead to implementation rather than abandonment.

Kant

Kantian inquirers employ a network of information sources. They are very broad in their search. They are not concerned with consensus, but rather, with objectivity. They search out differing points of view and are comfortable with inconsistency and multiple perspectives. Kantians easily accept new information into their existing mental models, and revise or discard models when they are no longer appropriate. They recognize change in their environments and the opportunities it presents, seeing change as progress. Kantians engage in active idea generation and brainstorming strategies. They argue to resolve rather than to win over. Their decisions are based on the synthesis of ideas, rather than on past experience or consensus.

Kantians would probably be considered creative by those theorists who subscribe to the notion that a well-prepared mind is more likely to be a creative mind, and that the essence of creativity is the act of bisociation.

Hegel

People who employ Hegelian systems of inquiry use values, beliefs and emotions in addition to logic. They care deeply about ethics. They theorize and create thought experiments to understand. Inquiry takes place through strong internal debate. The Hegelian executive constructs alternate perspectives from his or her own understanding, and then frequently has difficulty choosing among them. Using our example of inflation, the executive may believe that raising the price of the company's products is an appropriate decision. The executive would then construct an argument to support the opposing perspective. Hegelians' mental models are much like a set of building blocks. They use the same basic blocks, consisting of values, emotions and facts, to build different structures. Hegelians believe that a better solution emerges from debate and the dialectic process. They are likely to think beyond the boundaries of standard rules and approaches. Hence, they are more likely to have ideas that can be characterized as leaps, but they have difficulty reaching decisions because of their endless internal debate.

To creativity theorists, Hegelians and Kantians are probably quite similar in terms of creative potential. However, Hegelians have a much harder time coming to a decision and are more likely to employ lateral thinking.

Singer

Singerians employ all systems of inquiry. They are characterized by frequent, dramatic, and unpredictable change. Convergence or consensus does not indicate progress to a Singerian. Rather, it indicates that is time to revisit. Finding an answer is less important than finding a better question. Singerians alternate between making things simpler and making them more complicated. They are comfortable with a myriad information sources. Bruner's (1965) description of idea generation as a heuristic rather than algorithmic process fits most closely with the Singerian model. Singerians find the optimum mix between commitment to a problem and detachment, between passion for it and decorum or reflection about it, and between deferral and immediacy.

Singerians are constantly assessing. They do not take anything for granted; everything is open for inspection at all times. They constantly question and work very hard at remaining bias-

free.

These five inquiry styles can be summarized in terms of the idea possibilities that emerge. Leibnizians take small steps. Their ideas consist of incremental changes. Lockeans are focused on consensus; hence, their ideas are usually the lowest common denominator, but they do not usually focus on ideas per se. Kantians' are searchers. Their ideas result from associations and combining information from diverse places. Hegelians construct ideas through internal debate of all the factors. They and the Kantians are typically the people that we consider creative. Finally, Singerians do it all. While many executives would like to believe they are this flexible, it would seem that few really are. Table 1 summarizes these reflections.

| Archetype | Descriptor | Indicators |
|------------------|--------------------|--|
| Leibnizian | Incrementalist | Takes small steps; ideas are usually modest changes |
| Lockean | Consensus Builder | Focuses on agreement among stakeholders rather than ideas per se |
| Kantian | Searcher | Combines information from diverse places; ideas result from unusual associations |
| Hegelian | Debater | Argues with him or herself to develop ideas |
| Singerian | Renaissance Person | Seems to be infinitely objective and flexible |

Table 1. Inquiry Types

Churchman (1971) put forward the argument that these five archetypes portray an evolution from the primitive forms of inquiry systems to the more advanced. In other words, everyone is capable of and employs Leibnizian forms of inquiry, but higher forms such as Kantian, Hegelian and Singerian are not attained, nor even attempted, by many.

Research Method

This research was designed to understand the relationship between inquiry and ideas so that our notion of archetype could be explored. We chose to focus on executives for several reasons. Since executives have the greatest capacity to affect their organizations' behaviours, they also have the most control over the inquiry system that they personally employ. Upper-level managers interpret information for their entire organizations (Daft & Weick 1984). They influence their organizations by setting agendas for subordinates' activities consistent with their own personal problem formulations (March & Simon 1958). In addition, executives have the power to ensure the implementation of their preferred inquiry systems. Hence, focusing on

executives gave us the most unencumbered view of personal inquiry possible in an organizational setting.

Fifty-two executives each took part in an hour-long interview that was designed to elicit an understanding of their approach to inquiry and the sources of their ideas. (Appendix 1 contains the interview guide.) The interviews were taped and transcribed for subsequent analysis.

Our questions were designed to elicit critical incidents (Flanagan 1954) in order to understand how executives generate ideas, resolve issues and change their minds. The critical incident technique consists of a set of procedures for collecting incidents of human behaviour that have special significance to the phenomenon of interest. An incident is any activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act. To be critical, an incident must occur in a situation where the purpose or intent of the act seems fairly clear to the observer and where its consequences are sufficiently definite to have little doubt concerning its effects.

In its basic approach, the critical incident technique is not new. After all, people have been observing each other for centuries. The technique supplements these activities by providing a structured set of procedures for analyzing and synthesizing such observations into a number of relationships that can be tested by making additional observations under different conditions. In summary, the critical incident technique, rather than collecting opinions, hunches, and estimates, obtains a record of specific behaviours from those in the best position to make the necessary observations and evaluations.

In our research, three different types of incidents were collected to ensure that the behaviours we captured and coded were consistent across different contexts: generating an idea, resolving an issue and changing a point of view. Consistency among all three ensures that the archetype is intrinsic to the interviewee and not the context.

The incident types were chosen to provide different perspectives on inquiry and idea generation. Asking about a recent instance of idea generation is obvious. Recent instances of resolving an issue and changing a point of view may be less so. We used issue resolution as a critical incident because the themes of knowledge and problem solving run through all the models of and keys to creativity. In fact, Cyert and March's (1963) theory of choice and theory of search and Simon's (1965) process of intelligence, design and choice are used extensively by creativity theorists. Hence, asking executives how they solve problems provides an alternate window into their idea generation processes. Finally, because of the important distinction between the incremental approaches of Leibnizians and Lockeans and the expansiveness and flexibility of Kantians, Hegelians and Singerians, we asked interviewees about changing their minds.

Convenience sampling was used to select participants. They included members of a business school visiting committee, business associates, university alumni, and people suggested by interested colleagues. No attempt was made to find particularly creative or uncreative individuals.

A major challenge for this research was to develop a reliable and valid coding scheme to classify the subjects. First, based on the literature reviewed above, we developed an

understanding of the similarities and differences among the archetypes. The first twenty-five interviews were then categorized independently by two of the three authors. Table 2 provides examples of the sorts of interview quotes that led to each classification.

| Leibniz | Locke | Kant | Hegel | Singer |
|---|---|---|---|--|
| <ul style="list-style-type: none"> - <i>“If you've done it enough times, there's always a right answer.”</i> - <i>“That's what management is; it's moving other people-- getting them to think your idea was theirs.”</i> - <i>“I think I get my best ideas when I'm listening to something that someone is presenting and I'm clicking off what that means to me and what it means to my organization.”</i> | <ul style="list-style-type: none"> - <i>“They all thought that this was something that needed to be done.”</i> - <i>“My clients often convince me to go in different directions.”</i> - <i>“I look to others to see what works and what doesn't work.”</i> - <i>“I make sure we all agree on goals and objectives.”</i> | <ul style="list-style-type: none"> - <i>“I've always liked to push the envelope a little bit. When I push my people, it's more to push them to think and to ask a series of questions to make sure they thought about it thoroughly than it is to tell them my opinion.”</i> - <i>“I don't feel there is anything wrong with changing your mind.”</i> | <ul style="list-style-type: none"> - <i>“I read many books unrelated to business.”</i> - <i>“I place a great deal of importance on values and ethics.”</i> - <i>“It's valuable to at least theorize about throwing off the four walls of what you're doing today and determine how you might otherwise accomplish it.”</i> | <ul style="list-style-type: none"> - <i>“I'm constantly assessing. I don't take anything for granted. I have very few mental models that are sacrosanct. Everything is open for inspection at all times.”</i> - <i>“I never need somebody to tell me (when I'm doing a good job)-I work to my own. Standards”</i> - <i>“I question everything.”</i> |

Table 2. Interview Quotes

Ten of the interviews, that, in the opinion of two of the authors, clearly reflected the five archetypes were used by the remaining author to develop a formal coding scheme using thematic analysis (Boyatzis 1998). This led to four dimensions by which we could identify the archetypes: approach to information acquisition, approach to change, relationship to others, and idea generation/problem solving process. Once the dimensions and codes were established, concrete indicators of each were developed. These appear in Appendix 2 along with the definitions of each code. Table 3 lists the archetypes and their descriptions.

| | Leibniz | Locke | Kant | Hegel | Singer |
|--|-------------|------------|---------------|---------------|---------------|
| Approach to information acquisition | Searching | Searching | Scanning | Scanning | Scanning |
| Approach to change | Maintaining | Reacting | Initiating | Initiating | Initiating |
| Relationship to others | Directing | Mediating | Collaborating | Internalizing | Unpredictable |
| Idea generation/ problem solving process | Retaining | Converging | Diverging | Debating | Unpredictable |

Table 3. Archetype Characteristics

Unlike most previous schemes, and as mentioned above, we did not focus on end points or continua. Rather, the code identified distinguishing characteristics about each archetype. It was our belief that the four dimensions varied together to form the archetypes. As a consequence, there are a few overlaps in the descriptions, since some of the archetypes share characteristics with each other. Given the interdependence of the characteristics, this configurational approach (Meyer, Tsui & Hinings 1993, Miller 1987) yields a discrete set of empirically viable combinations enabling us to consider idea generation holistically, a marked improvement over assessing the unreasonably large number of combinations of individual characteristics, context variables and process alternatives that are possible.

Once the codes and indicators had been established, we used the second set of twenty-seven interviews to determine their precision. One of the authors reviewed the second group of transcripts in the same way that the first set had been evaluated, and another author used the codes to determine archetypes. We then compared these independent assessments to determine the validity of the coding structure.

Findings

Subjects in the first group of interviews ranged in age from thirty-three to seventy-seven with a median of forty-nine. Seventy-five percent had at least one graduate degree, and only one had not finished college. Educational backgrounds were varied. Arts, science, social science, business, law and engineering were all represented. Most participants were heads of their organizations or reported directly to the head. Only two reported to someone who reported to the president. Tenures in their organizations ranged from two years to thirty-six, with a median of twelve. Tenure in position ranged from one year to twenty-eight with a median of eight. Two participants were female. One of the interviews could not be classified because the interviewee was too brief in her responses to questions.

Agreement between the two coders of the first set of interviews was perfect. The sample

contained fourteen Leibnizians, three Lockeans, three Kantians, two Hegelians, and three Singerians.

Participants in the second set of interviews were not much different from the first set. Age ranged from forty to fifty-eight with a mean of forty-eight. Seventy-three percent had an advanced degree and many disciplines were represented. The group contained sixteen presidents and six who reported to the president of their organization. The remainder were one level below that. Tenure in the organization was between one and thirty-eight years with a mean of seventeen. Tenure in the position was between one and twenty-nine years with a mean of six. One of the participants was a woman.

Two of the interviews in the second group could not be coded because of poor quality transcripts. In nineteen of the remaining twenty-five the coders agreed. After discussion, the coders came to agreement on the coding of five more interviews. The group comprised twelve Leibnizians, three Lockeans, eight Kantians, no Hegelians and one Singerian. In one case, the two coders could not agree on archetype, even after discussion. Table 4 shows how the second group was evaluated. For each participant, it lists the number of times each of the indicators was coded and the resulting archetype.

| Respondent | Liebniz | | | Searching | Locke | | | Kant | | Scanning | Initiating | Hegel | | Archetype |
|------------|-------------|-----------|-----------|-----------|----------|-----------|------------|---------------|-----------|----------|------------|---------------|----------|-----------|
| | Maintaining | Directing | Retaining | | Reacting | Mediating | Converging | Collaborating | Diverging | | | Internalizing | Debating | |
| 1 | | | | 1 | 1 | | | 4 | 3 | 1 | 5 | 1 | 1 | Kant |
| 2 | | 2 | 2 | | | | | | | | | | | Liebniz |
| 3 | | 6 | 2 | 3 | | | | | | | | | | Liebniz |
| 4 | | 1 | 1 | | 1 | | | 1 | 1 | 4 | | | | Kant |
| 5 | | 4 | 2 | 1 | | | | | | 1 | | | | Liebniz |
| 6 | | 11 | 5 | | | | | | | | | | | Liebniz |
| 7 | 1 | 1 | | | | | | | | | | | | Liebniz |
| 8 | 3 | 2 | 6 | | | | | | | | | | | Liebniz |
| 9 | | 1 | | 2 | | | | 2 | 2 | 3 | | | | Kant |
| 10 | 1 | 2 | 2 | 1 | 1 | | | | | | | | | Liebniz |
| 11 | | 2 | 1 | 1 | | 2 | 1 | 2 | | 3 | | 5 | | Singer |
| 12 | 2 | 4 | 3 | 4 | | | | | | | | | | Liebniz |
| 13 | | 1 | | | 2 | 1 | | 6 | 1 | 3 | | | | Kant |
| 14 | | 4 | | | | | | 3 | 5 | | 1 | | | Kant |
| 15 | | | | | | | | 3 | 4 | 1 | 1 | | | Kant |
| 16 | 1 | 11 | 1 | 1 | 1 | | | | | | | | | Liebniz |
| 17 | | 1 | 5 | | 3 | 3 | 3 | | | | | | | Locke |
| 18 | | 1 | 2 | 4 | 2 | 5 | 3 | | | | | | | Locke |
| 19 | | 9 | 1 | 3 | | | | | | | 2 | | | Liebniz |
| 20 | 1 | 2 | | | | | 1 | 2 | 2 | 1 | 5 | 1 | | Kant |
| 21 | | 3 | 2 | | | | | | | | | | | Liebniz |
| 22 | 1 | 5 | 1 | 3 | | | | | | | | | | Liebniz |
| 23 | | 2 | 1 | 1 | | | | 2 | 1 | 2 | | | | Kant |
| 24 | | 1 | | 6 | 1 | 2 | 4 | | | | | | | Locke |

Note: One disagreement has been excluded from the table

Table 4. Respondent Coding

An alternate explanation to the intrinsic nature of archetypes is that they are merely a manifestation of demographics, industry or employment. Our data refute this possibility. While we do not have enough data to statistically determine correlations between the archetypes and various demographic factors such as age, tenure, position, and industry, visual inspection does not point to any particular relationships. Table 5 shows the relationships between archetype and industry and Table 6 shows the relationships between archetype and organizational position for all the interviews.

| | Liebniz | Locke | Kant | Hegel | Singer |
|----------------------|---------|-------|------|-------|--------|
| Manufacturing | 3 | 2 | 6 | 1 | 3 |
| Non-Profit | 9 | 0 | 2 | 0 | 1 |
| Financial | 8 | 2 | 1 | 1 | 0 |
| Service | 6 | 2 | 2 | 0 | 0 |

Table 5. Archetype by Industry

| | Liebniz | Locke | Kant | Hegel | Singer |
|-----------------------------------|---------|-------|------|-------|--------|
| CEO/President | 13 | 5 | 6 | 1 | 3 |
| One Level Removed | 9 | 0 | 4 | 1 | 0 |
| Two or More Levels Removed | 4 | 1 | 1 | 0 | 1 |

Table 6. Archetype by Organizational Position

Implications and Future Research

Our results indicate that recognizable inquiry archetypes emerge for most people. This leads to several implications for research and practice.

First, creating environments that are conducive to idea generation may not be as fruitful as employing people who have characteristics that are similar to those of the more creative archetypes. These archetypes (Kant, Hegel, Singer) were relatively rare in both our samples. It may be that Leibnizian tendencies are more appropriate for senior executives. However, it may also be that Leibnizians in positions of hiring authority tend to hire people like themselves, since they are less inclined to inquire outside their trusted fact net.

Second, it would seem that questions about information sources, ideas, problem solving, and changing point of view can be used in hiring and promotion decisions to help to determine

the nature of the creativity one might expect from an individual. For example, an organization that wanted to ensure that their programmers were Kantian, rather than Leibnizian in approach might ask them about what they read beyond what is required for work, and to describe their last idea for a software innovation. An organization looking for a “get it done” kind of leader might look to these questions to ensure that they found a Leibnizian.

Because the archetypes follow distinct patterns for the most part, seeing one part of a pattern might provide insight into the rest of it. Noticing that someone is truly a scanner in their information acquisition approach would lead one to believe that this person is more likely to be creative than someone who is a searcher. Someone who is dialectical or divergent in idea generation would make him or her more likely to scan information than someone who is a maintainer. Hence, he or she is more likely to use information scanning resources effectively. Unfortunately, more information or better scanning resources are unlikely to make Leibnizians and Lockeans more creative.

The most important task to be undertaken in this stream of research is to test the coding scheme on a larger, more diverse sample. In addition, it is important to investigate whether or not these archetypes are the most appropriate, or if more or fewer archetypes with different characteristics better capture idea generation. Then, future research could investigate whether or not there are relationships between the archetypes and more traditional measures such as those developed by Jung and Kolb. It could also investigate how combinations of archetypes work together in organizations, and the exact nature of the ideas that each archetype generates, evaluates and implements.

Using archetypes based on philosophy to provide insight into inquiry and ideas provides a new theoretically based approach to understanding creativity. It also provides a rationale for some of the inconsistencies in current creativity research, and the beginnings of a tool that can be used to understand creativity inclinations.

Appendix 1

Guide For Initial Interview

Please tell me about yourself. What is your educational background? How did you get to where you are now? (Abbreviated life story.)

Please tell me about your job. What are your responsibilities? How do you spend your time? What type of information do you get and ignore?

Remember a recent instance when you came up with an idea. What was the idea? Can you recall why or how you got that idea?

How do you usually get ideas?

Remember an instance when you resolved an issue. What issue did you resolve? What enabled you to resolve it?

How do you usually resolve issues?

Please describe an instance of changing your mind recently. (Areas to investigate might include the future/values/cause-effect/goals/duties/ethics/profit/employees/superiors.) Who was involved? What caused you to change your mind? How did it feel?

How do you stay informed? How do you use information in your job? What kind of information do you use? (Computer reports, people inside the organization, outside the organization?) How do you decide what information to look at?

Appendix 2 Coding Indicators

Approach to Information Acquisition

Label: *Searching*

Definition: Searching for information with a pre-determined agenda and focus.

Indicators: Coded when the person:

- a. seeks specific information or information with specific characteristics and content
- b. looks at (evaluates, interprets) information from a pre-specified perspective
- c. seeks and/or receives information from similar, stable sources

Label: *Scanning*

Definition: Scanning for information with a broad agenda and view.

Indicators: Coded when the person:

- a. seeks diverse information or information with diverse characteristics and content
- b. looks at (evaluates, interprets) information from several perspectives
- c. seeks and/or receives information from various, diverse sources

Approach to Change

Label: *Reacting*

Definition: Initiating or considering change in reaction to a real or potential problem or issue.

Indicators: Coded when the person:

- a. is prompted by others about change
- b. triggers change in order to adapt to circumstances

Label: *Maintaining*

Definition: Initiating or considering change in order to maintain the status quo

Indicators: Coded when the person:

- a. initiates change only in the face of inevitabilities
- b. is slow or hesitant to initiate change
- c. triggers change to maintain consistency

Label: *Initiating*

Definition: Initiating or considering change in order to increase capacity, improve competitiveness, and/or influence the environment.

Indicators: Coded when the person:

- a. self-initiates change
- b. is prompted to change by opportunities and/or futuristic visions
- c. triggers change in order to take advantage of, contribute to, and/or participate in emerging situations or patterns

Relationship to Others

Label: *Directing*

Definition: Authoritatively directing others

Indicators: Coded when the person:

- a. maintains a strong personal point of view
- b. considers herself the most knowledgeable in her environment, and often takes the role of educator
- c. attempts to convince and/or manipulate others
- d. tells people what to do

Label: *Mediating*

Definition: Authorizing and/or empowering others to generate ideas, solve problems, and make decisions.

Indicators: Coded when the person:

- a. relies on the judgements and opinions of others
- b. invites and/or expects others to develop ideas and solutions
- c. creates and/or enacts processes/structures for others to develop ideas and solutions

Label: *Collaborating*

Definition: Joining with others to generate ideas, to solve problems, or to make decisions.

Indicators: Coded when the person:

- a. includes judgements and opinions of others
- b. asks and/or instructs others to develop ideas and solutions
- c. actively involves himself with others in the processes/structures of idea and solution development

Label: *Internalizing*

Definition: Attempting to resolve problems individually by playing through multiple scenarios.

Indicators: Coded when the person:

- a. assumes the role of others when considering the problem
- b. plays through multiple scenarios in her mind
- c. examines contingencies

Idea Generation/Problem Solving Process

Label: *Retaining*

Definition: Focusing on ideas, perspectives, and inputs that affirm and/or complement one's own approach.

Indicators: Coded when the person:

- a. takes personal control of idea and solution development efforts
- b. heavily relies on his/her own judgements and opinions
- c. seeks consistency and confirmation of personal viewpoint
- d. highly values and/or relies on past experiences

Label: *Converging*

Definition: Closing in upon ideas, perspectives, and inputs to find an agreeable solution and/or conclusion.

Indicators: Coded when the person:

- a. seeks consensus and agreement among approaches and ideas
- b. seeks synthesis of ideas and information
- c. clearly defines the boundaries and parameters for ideas and solutions

Label: *Diverging*

Definition: Considering and expanding upon many ideas, perspectives, and inputs in order to develop a specific solution and/or conclusion.

Indicators: Coded when the person:

- a. is comfortable with inconsistency
- b. seeks diverse experiences and input
- c. is flexible around the boundaries and parameters for ideas and solutions

Label: *Debating*

Definition: Debating several ideas, perspectives, and inputs in order to develop a specific solution and/or conclusion.

Indicators: Coded when the person:

- a. challenges and/or likes to be challenged by others' perspectives
- b. engages and/or likes to be engaged in dialectical debates and discussions
- c. experiences difficulty in choosing sides or reaching resolution in conflicting situations

References

- Adams, J.L. 1974. *Conceptual blockbusting*. San Francisco: W.H. Freeman & Company.
- Amabile, T.M. 1988. "A model of creativity and innovation in organisations." *Research in Organizational Behavior*, 10:123-167.
- Boland, R.J., R.V. Tenkasi, & D. Te'eni. 1994. "Designing information technology to support distributed cognition." *Organization Science*, 5(3): 456-475.
- Boyatzis, R.E. 1998. *Transforming qualitative information*, Thousand Oaks, CA: Sage.
- Bruner, J. 1965. "Some observations on effective cognitive processes." In G.A. Steiner (ed.) *The Creative Organization*, Chicago: University of Chicago Press, 106-117.
- Campbell, D.T. 1960. "Blind variation and selective retention in creative thought as in other knowledge processes." *Psychological Review*, 67(6): 380-400
- Churchman, C.W. 1971. *The design of inquiring systems: Basic concepts of systems and organization*, New York: Basic Books, Inc.
- Connolly, T & B.K. Thorn. 1987. "Predecisional information acquisition: Effects of task variables on suboptimal search strategies." *Organizational Behavior and Human Decision Processes* 39: 397-416.
- Cyert, R.M. & J.G. March. 1963. *A behavioral theory of the firm*, Englewood Cliffs, N.J.: Prentice Hall.
- Daft, R.L. & K.E. Weick. 1984. "Toward a model of organizations as interpretation systems." *Academy of Management Review*, 9 (2): 284-295.
- Dasgupta, S. 1996. *Theory of technological creativity*, New York: Oxford University Press.
- DeBono, E. 1967. *New think*, New York: Basic Books.
- Einstein, A. & L. Infeld. 1938. *The Evolution of physics*, New York: Simon & Shuster.
- Flanagan, J.C. 1954. "The critical incident technique." *Psychological Bulletin*, 51(4), 327-358.

- Fiol, M. 1995. "Thought worlds colliding: The role of contradiction in corporate innovation process", *Entrepreneurship theory and practice*, 19(3) 71-9.
- Gadamer, H.G. 1976. *Philosophical hermeneutics*, Berkeley, CA: University of California Press.
- Giddens, A. 1979. *Central problems in social theory*, London: MacMillan.
- Glaser, M. 1995. "Measuring intuition." *Research and Technology Management*, March-April: 43-46.
- Harre, R. & Gillett. 1994. *The discursive mind*. Thousand Oaks, CA: Sage.
- Hayes, J.R. 1989. "Cognitive processes in creativity." In J.A. Glover, R.R. Ronning & C.R. Reynolds (eds.) *Handbook of Creativity*, New York: Plenum Press: 135-145.
- Kolb, D.A. 1984. *Experiential learning, Experiences as a source of learning and development*, Englewood Cliffs, NJ: Prentice-Hall.
- Kiesler, S. & L. Sproull. 1982. "Managerial response to changing environments: Perspectives on problem sensing from social cognition." *Administrative Science Quarterly*, 27: 548-570.
- Kirton, M.J. 1976. "Adaptors and innovators: A description and measure." *Journal of Applied Psychology*, 61 (5): 622-629.
- Koestler, A. 1964. *The act of creation*, New York: Macmillan.
- Logan, R.K. 1995. *The fifth language*, New York: Stoddart Books.
- March, J.G. & H.A. Simon. 1958. *Organizations*. New York: John Wiley & Sons.
- Meyer, A.D., A.S. Tsui & C.R. Hinings. 1993. "Configurational approaches to organizational analysis." *Academy of Management Journal*, 36: 1175-1195.
- Miller, D. 1987. "The genesis of configuration." *Academy of Management Review*, 12: 686-701.
- Newell, A., H.A. Simon & J.C. Shaw. 1962. "The process of creative thinking." In H.E. Gruber, G. Terrell & M. Wertheimer (eds.) *Contemporary approaches to creative thinking*, New York: Atherton Press, p. 65-66.

- O'Reilly, C.A., J.A. Chatman and J.C. Anderson. 1987. "Message flow and decision making." In F. Jablen, L. Putnam, K. Roberts & L. Porter. (eds.), *Handbook of Organizational Communication*, Beverly Hills, CA: Sage.
- Prietula, M.J. & H.A. Simon. 1989. "The experts in your midst." *Harvard Business Review*, January-February: 120-124.
- Rosak, T. 1986. *The cult of information*, New York: Pantheon Books.
- Saunders, C. & J.W. Jones. 1990. "Temporal sequences in information acquisition for decision making: A focus on source and medium." *Academy of Management Review*, 15(1): 29-46.
- Shalley, C.E. 1995. "Effects of coaction, expected evaluation, and goal setting on creativity and productivity." *Academy of Management Journal*, 38(2): 483-503.
- Simon, H.A. 1965. *The shape of automation*. New York: Harper & Row.
- Voss, J.F. & M.L. Means. 1989. "Toward a model of creativity based upon problem solving in the social sciences." In J.A. Glover, R.R. Ronning & C.R. Reynolds (eds.) *Handbook of Creativity*, New York: Plenum Press: 399-406.
- Wallas, G. 1926. *The art of thought*, New York: Harcourt, Brace.
- Weisberg, R.W. 1993. *Creativity: Beyond the myth of genius*, New York: W.H. Freeman & Co.
- Woodman, R.W., J.E. Sawyer & R.W. Griffin. 1993. "Toward a theory of organizational creativity." *Academy of Management Review*, 18(2): 293-321.

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