

**STRATEGIES AND TACTICS TO ACCESS INTUITION:
A LOOK AT THE MOMENT OF SOLUTION**

by

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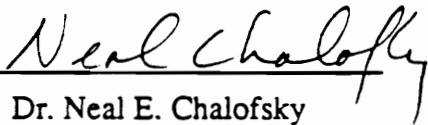
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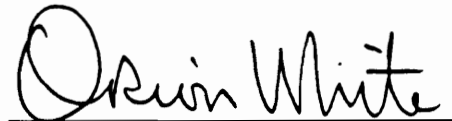
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(ABSTRACT)

This qualitative case study addressed the question, "What strategies and tactics do people use to access intuition in solving complex, ill-structured problems?" Such problems are not routine, well-defined, or solved by immediate application of well-known procedures or decision rules. A comprehensive literature review revealed a paucity of empirical data on accessing intuition during problem solving. Additionally, while some posited a relationship between ill-structured problems and intuitions, no studies existed linking the two.

This study explored people's specific actions at the moment when an overall solution becomes apparent to the problem solver. It focused on both the conscious actions people take to access their intuition (strategies) and on the conscious or unconscious skills, clusters of related skills, or procedures (tactics) they use (Gerber, 1983), as well as underlying tacit processes (Fischbein, 1987). Participants were 11 human resource managers. This group was chosen because its members frequently encounter complex, ill-structured problems or help others

focus on how to solve such problems. Specific individuals were recommended by colleagues who considered them to be articulate and interested in intuition. They completed journals to document the moment of solution and participated in follow-up, in-depth interviews. To ensure internal validity, participants acted in the role of “co-researchers.” They reviewed manuscripts, journals, and interviews for accuracy and reviewed written narratives to ensure that their statements had been understood. Two corroborated the process of category construction.

A qualitative content analysis of journal results indicated that in seven instances intuitions occurred when participants were with others and that these seven were listening in some fashion at the moment of solution. Further analysis, which incorporated the interviews, indicated that actions most frequently taken at the moment of intuition included immersion, searching, thinking—working on task, undirected thinking, making connections, and listening. Whether a given action was a strategy, tactic, or tacit process depended on how deliberately people acted and how aware they were of their actions. Results also showed that problems were ill-structured and that intuitions had characteristics consistent with those identified by Fischbein (1987). Finally, the study found that, for the participants in this case study, the dynamics of intuition can be summed up with the following proposition: A propelling concern to solve a complex problem leads to continuous search and spontaneous combustion.

Implications for future research suggest the need for a conceptual framework for studying intuition; extended research in the workplace and other

settings, examining especially instances when people are with others at the moment of solution; a more in-depth investigation of actions to access intuition, focusing on specific actions such as listening as well as the sequencing of all actions; and inquiry into how people's values and beliefs affect their actions. It is recommended that practitioners join in research efforts as well as engage learners in an exploration of their own actions to access intuition during problem solving.

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Judith W. Gauthier, Susan Roberts-LeBlanc and Mary L. McAndrew of Ernst & Young played key roles in developing tools for analyzing data and shaping the final document. Judith designed two software applications on HyperCard allowing me to easily label, sort, and combine literature review notes and data elements. These enhanced organization and saved significant amounts of time. Susan edited chapter drafts, making them more clear and succinct. Mary's help was invaluable. She organized the entire production process, designed charts and figures, and continually edited and proofread the manuscript.

I especially thank the eleven human resource development managers who participated in the study. These busy people, who will remain anonymous, took time out of crowded schedules to record and discuss their actions and intuitions. They made their personal reflections available so that we all might learn more about accessing intuition while problem solving.

Other scholars and researchers also contributed their time and reflections on intuitive processing. These included: Daniel Cappon and Malcolm Westcott, York University, Toronto; Lorna Catford, Institute of Transpersonal Psychology; Patricia Samuel, Boston University; and P. Ranganath Nayak, Arthur D. Little Company. Conversations with them, as well as reading the works of Bastick, Goldberg, Fischbein, Perkins, Simonton, Westcott, and others, helped provide a context for study synthesis.

My deepest thanks go to those at home and at work who provided an environment conducive to learning. My husband, John, consistently showed his support in tangible ways, playing a significant role in caring for our children during the years I pursued graduate studies. He also helped through equally important, but less defined tasks, such as listening to what must have seemed interminable discussions on the role of intuition in problem solving and bolstering my occasionally faltering courage. Each of my children, Christopher, Katherine, and Alan, has been patient and accepted our deferring individual or family activities until that magic moment in time “when I finish my dissertation.” All three exhibited their own commitment to learning and supported my undertaking.

Throughout my graduate career, I have been a more than full-time worker in Ernst & Young’s National Professional Development Group. The resulting balance between work and study

brought not only planning and practicality to school projects but also ideas and research to my job. I feel fortunate to have had this experience and am proud to be a part of Ernst & Young, which not only tolerates learning in the workplace, but fosters it. I am particularly thankful to the three people to whom I reported directly. Ernest E. Bartholomew provided early encouragement and helped me clarify my goals. Thomas W. Farley, a strong believer in creative thought and action, cheered me on. Finally, David A. Wilson, my current supervisor, provided continuous support throughout the dissertation process. Moreover, he shared helpful suggestions and reflections on the process from his own experiences, as student and professor.

In a time where life-long learning will be needed for professional advancement and business survival, such positive stances toward workplace learning as I experienced will need to be the norm, rather than the exception. The climate that has been established in the Professional Development Group at Ernst & Young is one worthy of emulation.

Dedication

To:

Barbara Louise Johnson Hanley

Martin Roquefort Hanley

and

Jean Schoonmaker Morris

My parents, Barbara and Marty Hanley, always assumed I would learn and expected me to do so. My husband's mother, Jean Morris, provided models of life-long learning and creative thinking. I love them greatly and miss them sorely.

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CHAPTER 1: THE MOMENT OF SOLUTION

Introduction

Despite the claims of many as to the centrality of intuitive processes to human thought, the definition of intuition and information on how people employ intuitive processes in problem solving remain murky. People use the term intuition to mean different things ranging from instinct, to insight, to inspiration. A better understanding of intuition, how it works, and how we access it is needed not only by adult educators, but by scholars and practitioners in a variety of disciplines.

While the study of intuition crosses many domains, there have been few empirical investigations concerning intuition, and these have approached the subject from many different angles. Moreover, a review of the literature indicates that while there is increasing interest in the role of intuition in problem solving, little data yet exist. This study investigates the query: “What strategies and tactics do people use to access intuition when solving complex, ill-structured problems?” Ill-structured problems are those which are not well-defined or routine and which cannot easily be solved with a set of standardized procedures (Silverman, 1985). The dissertation focuses on the particular moment in the problem-solving process that the solution becomes apparent to the solver. This moment, called by some the moment of breakthrough, I call the moment of solution. It is the discernable point in time that the problem solver feels certain that the problem is solved—even though many details may need to be worked out.

This chapter discusses intuition, its pervasiveness in thinking processes, and its importance in thinking, learning, and the field of adult education. It notes research about intuition and its use in problem solving, paying particular attention to the use of intuition in solving organizational and business problems. The chapter also shows how the question of how people access intuition fits into current research and practice and how it may connect with future efforts.

Intuition: A Powerful Pervasive Process

Fischbein (1985), Bastick (1982), and Harman and Rheingold (1984) are a few of many who detail intuition's role in problem solving and the creative process. According to Bastick (1982), "Insight or intuition is relevant to all fields of study and all walks of life. It is a universal experience, little understood but treasured and sought after by all." Bastick's (1982) comprehensive literature review notes that:

. . . intuition is a powerful human faculty, perhaps the most universal natural ability we possess. Newton and the apple, Archimedes in the bath, Pythagoras gazing at his tiled wall and the many other legends of intuition illustrate the power of this ability (p. 2).

Referencing such scientists and theorists as Lorenz, Poincaré, Bruner, and Clinchy, and others, Bastick goes on to claim that not only has intuition been a factor in the great mathematical and scientific discoveries, works of poetry, music, and art of humankind, but that it also is used frequently in our everyday lives. Indeed, he points out

that, according to Neisser, “mental processes of this kind seem to be common wherever there are situations too complex for ready logical analysis” (Bastick, 1982, p. 3).

Harman and Rheingold (1984) reviewed the reflections of the creative processes of such people as composers Puccini, Strauss, Mozart, Stevenson, Tartini, Beethoven, Tchaikovsky, and Wagner; writers and poets Shelley, Keats, Sand, Elliot, Goethe, Wordsworth, Longfellow, Coleridge, and Kipling; mathematicians Gauss, Poincaré, and Ramanujan; and scientists Bohr, Loewi, and Kekule. They state that those members of society “designated by such terms as artist, inventor, genius, visionary, and so forth—the great creative thinkers and originators” (Harman and Rheingold, 1984, p. 4) have almost invariably experienced some type of breakthrough insight and provide examples of the types of experiences these scientists and artists underwent. Harman and Rheingold (1984) state that these breakthroughs involve tapping into the unconscious mind. They write:

Between the most ordinary creative manifestations of the “hidden mind” and the “higher” unseen spectrum lies the middle ground, the recognized “visible” part of the creative rainbow. Among the names we give to some of the more familiar creative hues are *intuition, inspiration, imagination, insight, vision, talent, foresight* (p. 2).

Harman and Rheingold ask if the talents of inventors and artists are possessed only by the very few, or if they are innate capacities we all possess and lack only the knowledge or training to make proper use of them. Harman and Rheingold and others believe we all have the capacity to use our “unconscious” mind as a resource for problem

solving. I agree. This belief underlies my look at the hue called intuition and the strategies and tactics people employ to access it in problem-solving situations in the workplace.

Gaining perspective

One of the difficulties in understanding intuition is the lack of a clear, precise definition. Put another way, there are multiple definitions that have developed over time and in different disciplines.

Webster's *New Riverside University Dictionary* defines intuition as the "act of knowing without the use of rational process: immediate cognition, knowledge applied by the use of this faculty, acute insight." The *American Heritage Dictionary of the English Language's* (1973) first meaning is very similar to Webster's and its second connects intuition with insight. *American Heritage* indicates that intuition comes from the Latin *intueri*, to look at or toward, to contemplate. Indeed the *Oxford English Dictionary* (1978) lists as its first definition "the action of looking upon or into; contemplation inspection a sight or view." It further describes intuition as the "spiritual perception of immediate knowledge, ascribed to angelic and spiritual beings, with whom vision and knowledge are identical" (drawn from scholastic philosophy) and as the "immediate apprehension of an object by the mind, without the intervention of any reasoning processes" (modern philosophy).

In the *International Encyclopedia of Education*, synthesizing from key research studies, Fischbein (1985) points out that the meanings attached to intuition vary widely.

Some describe it as an unreliable common sense source of knowledge. Descartes and Spinoza, on the other hand, assert that intuition is the primary source of all true knowledge. Fischbein indicates that, in education, intuition is used in a way similar to “sensorial knowledge” meaning that the learner has to first sensorially know the objects to which a concept is related. According to Fischbein, in mathematics and science, intuition refers either to the moment of “illumination” in a problem-solving process or to a self-evident statement.

To Fischbein (1985), intuitive knowledge is both self-evident and extrapolative: that is, it is immediate knowledge felt certainly and is also a minitheory which exceeds the data at hand. Thus, Fischbein (1985) asserts that intuition possesses two basic groups of properties:

one group is shared with the domain of sensory perceptions (self-evidence, globality, immediacy), and a second group is shared with the domain of logical inferences (extrapolative capacity, final stage of an [implicit] sequence of inferences, feeling of certitude). It is the synthesis of these two apparently contradictory groups of features which confers on intuition this specific feeling of immanent necessity, of evident certitude (p. 2690).

Intuitions connect previously unarticulated or unrealized perceptions with a framework for articulation. Intuitions are frequently expressed as metaphors, analogies, and models. A step away from “concrete” reality, they structure and frame perceptions, and are vehicles for inference. Intuitions also link the past, the present, and the future and provide “behavioral certainty” for ideas (Fischbein, 1987). Thus, intuition seems poised

between sensory perception and logical analysis. It is not in opposition to logic, as many believe (Bastick, 1982). Rather it is a bridge—or in today's vernacular, an interface.

Fischbein tentatively classifies intuitions into four categories: *affirmatory*, *conjectural*, *anticipatory*, or *conclusive*. The basis of this categorization is the role intuition plays in the problem-solving process. With affirmatory intuitions, both the problem-solving activity and solution are implicit from the problem solver. Affirmatory intuitions can be thought of as mental models. The individual affirms or claims something and accepts interpretation of facts as self-evident or certain. Affirmatory intuitions are divided into primary and secondary groups. Primary intuitions develop naturally without instruction and are developmental phenomena changing slowly with age. Secondary intuitions are an effect of instruction. Conjectural intuitions are assumptions about future events. As with affirmatory intuitions, the individual is not explicitly attempting to solve a problem.

Anticipatory and conclusive intuitions are called problem-solving intuitions, and appear when individuals are engaged in the process of solving a problem. Anticipatory intuitions occur when a problem solver has a global view of the solution and a feeling that it has been reached but has not yet completed an analytical detailed solution. Conclusive intuitions summarize in a global, unique, internally-structured view the strategy which has been used for solving the problem. This dissertation identifies the strategies and tactics people use to access intuition in problem-solving situations; thus, its focus is on anticipatory problem-solving intuitions.

Intuition's Importance

Since intuition plays such a pervasive and powerful role in thinking processes, educators at all levels have an interest in discovering more about this phenomenon. Through such understanding educators can help learners either develop or release their intuitive capacities. Moreover, those working in adult education and human resource development have a particular concern for identifying the strategies people use to access intuition during problem solving. Such information might help adults not only to understand themselves better but also to enhance their job performance.

Fischbein (1985) presents four reasons to “encourage the development of new intuitive interpretations and representations as an effect of systematic intellectual education” (p. 2692). They are:

1. Every productive mental activity—understanding, problem solving, creative ability—implies the participation of intuitive forms of knowledge. Every solving or creative attempt implies moments of plausible, extrapolative guesses. Such intuitive leaps and synthesizing endeavors have to be stimulated and systematically educated in school.
2. Affirmatory intuitions may be incomplete or wrong—and “controlling, refining, or shaping anew internal models of the learner is one of the main tasks of the teaching process.”

3. The learner has to be taught to analyze and control intuitions and to find explicit justifications for them.

4. Since affirmatory intuitions are a basic source of anticipatory intuitions, tentative solutions are inspired, directed, organized, or blocked by prior intuitive biases.

Bastick (1982) claims that intuition is basic to the educational process. "In both learning and teaching at all levels, the intuitive process should be employed." However, in an extensive review of the literature, he found that "little was known about how to train intuition" (p. 10). He quotes Bruner and Clinchy (1966) who claim that "nothing is known about the training of intuition and that very likely we are still too unclear about what is intended by the word to devise proper educational procedures" (p. 10). Since then, other writers and researchers (for example, Vaughan, 1979; Brown and Wolf, 1986; and Goldberg, 1983) have discussed techniques to train intuition. They do not, however, closely link techniques to particular strategies people use to access or employ intuition while solving complex, ill-structured problems.

Several (Agor, 1986; Catford, 1987; Chinen, Spielvogel, and Farrell, 1985; Goldberg, 1983; Herrmann, 1982; Luconi, Malone and Scott Morton, 1986; Mintzberg, 1976; and Silverman, 1985) discuss the use of intuition in problem solving by professionals. Mintzberg (1976), Agor (1986), Silverman (1985), and Luconi, Malone, and Scott Morton (1986) all see a primary role for intuitive processing in management decision making. Mintzberg (1976) speculated that there may be "a fundamental difference" between formal planning and informal managing. He contends that managing involves synthesizing and holistic thinking and describes it as intuitive and experimental.

Noting the then heavy emphasis on analytic skills in business schools, Mintzberg called for a new balance between the analytic and intuitive in our schools and the use of role play and simulations as tools to develop these skills.

Agor (1986) provides more specifics about where intuition is used in problem solving. In a detailed survey of 100 executives, he asked them the question, “When using your intuition, have you found it functions best only with *certain* problems/issues/circumstances, or do you use it freely to help guide *all* your major decisions?”

The executives indicated that they believed intuition serves them best under the following circumstances:

- Where there is a high level of uncertainty
- Where there is little previous precedent
- Where variables are less scientifically predictable
- Where facts are limited
- Where facts do not clearly indicate the direction to take
- Where analytical data are of little use
- Where there are several plausible alternative solutions to choose from, with good arguments for each
- For negotiations and personnel decisions

Such circumstances produce situations where problems are ill-structured (Silverman, 1985).

Luconi, Malone, and Scott Morton (1986) suggest an even more clearly significant role for intuitive processes in the future. In their discussion of expert systems, expert support systems, and decision support systems, they emphasize that although many computerized systems now exist to solve structured problems, managers will continue to face ill-structured problems. For example, despite advances in computer technology, in some cases it is impossible or impractical to encode all the relevant knowledge experts need to solve ill-structured problems. In such a situation, humans can use expert support systems to inspect and control the problem-solving process. People can use machines to manipulate the data and their minds to see patterns and choose strategies. The development of pattern-finding skills and goal-setting skills combined with our more advanced computer technologies should react synergistically for greater advances in productivity.

This expanded attention to intuition's role in problem solving suggests that training and development professionals will need to know more about intuition and its use. Right now, while there are a number of lists of intuitive strategies, techniques, or exercises to encourage intuitive or creative problem solving (Agor, 1986; Goldberg, 1983; and Herrmann, 1982), there is little beside anecdotal data to attest to the specific use and value of each technique. More information on the specific strategies people use to access intuition during the problem-solving process in the workplace can help us learn more about intuition and problem solving. In the long term, it may contribute to development of specific training and development activities.

Building on and extending existing research

This dissertation builds on and extends existing research on the topic of intuition. The literature review provides a foundation for an analysis of written and oral reports on the strategies and tactics people use to access their intuition when they solve problems. Based on study results, implications for future research are suggested.

Existing Research

Westcott (1968, 1984), Bastick (1982), and Fischbein (1987) provide overviews of the literature on intuition in many different domains. They, as well as Simonton (1980), Goldberg (1983), and Vaughan (1979), also provide overviews of research and theory about intuition and problem solving. Others—Agor, (1986); Catford, (1987); Chinen, Spielvogel, and Farrell, (1985); and Silverman, (1985)—present information about a few specific empirical studies and theoretical works that also address the role of intuition in problem solving.

There are a number of lists of techniques or exercises to encourage intuition in problem solving—Agor, (1986); Goldberg, (1983); and Herrmann, (1982). However, there is little beside anecdotal data or personal opinion to attest to the specific use and value of each technique. Agor (1986); Chinen, Spielvogel, and Farrell (1985); Goldberg, (1983); and Silverman, (1985) attest to the fact that business people and other professionals use their intuition and suggest approaches or techniques. However, these scholars do not provide concrete and detailed information about the use of specific strategies to access intuition.

Despite a growing attention to intuition in psychological and educational journals, a review of the research on intuition, as it relates to the problem solving, provides no definitive answers about intuition and its role in the problem-solving process. Indeed, the research is scattered, with different researchers focusing on different aspects of intuition and either using different definitions or using the common usage definition from the dictionary.

Both Catford's (1987) analysis of problem-solving strategies and Chinen, Spielvogel and Farrell's (1985) phenomenological research provide some concrete data on intuition used in problem solving. Also, questionnaires like those developed by Agor (1986) and Herrmann (1982) provide additional data. However, the lack of observational data on intuition and its use in problem solving limits understanding of what people do when they use their intuition. This, in turn, constrains adult educators' ability to determine how to assist people to develop or release their intuition.

This study

This study examines the strategies and tactics people use to access intuition to solve complex, ill-structured problems. It focuses specifically on the anticipatory problem-solving intuitions people experience at the moment the solution becomes apparent or breaks through (Fischbein, 1987). In these instances, problem solvers believe they have found the problem's solution, even though they have not spelled out all the details. This study differs significantly from previous investigations into the role of intuition in problem solving. Differentiating characteristics of this study include: 1)

examining the role of intuition vis-a-vis ill-structured problems; 2) focusing on Fischbein's (1987) anticipatory intuitions and the specific moment in time the solution becomes apparent to the solver; and 3) addressing strategies and tactics used to access intuition in workplace problems.

Silverman (1985) has made the linkage between ill-structured problems as defined by information theorists Newell and Simon (1972) and the type of problems Agor (1986) and others see management using intuition to solve. However, no other studies have specifically addressed the function of intuition in the solution of these complex, ill-structured problems. Similarly, while anecdotal data and diaries describe the moment of solution where Fischbein's anticipatory intuitions appear, no other studies have used Fischbein's classification as the basis of investigation. Finally, the emphasis on strategies and tactics focuses this study specifically on the behaviors people use to access intuition to solve problems in the workplace. Moreover, each participant chose his or her own problem to report on.

Integration with current and future efforts

Interest in research on intuition and its use in problem solving is increasing. A clearer understanding of what strategies people use to access their intuition to solve problems will contribute directly to these larger efforts. Additionally, the existing research on intuition is in what Kuhn (1970) would call a pre-paradigmatic state: that is, the research consists of facts, anecdotal material, and suspicions but no strong, elegant theory. Thus, additional research into its definition and its use in problem solving can aid in developing testable hypotheses.

Fischbein (1985), citing the works of Fischbein, Tall, Viennot, and diSessa, reports that in the latter half of the 1970s there was a renewed interest in the role of intuitive forms of knowledge in relation to mathematical and scientific thinking. Bastick (1982), Vaughan, (1979), and Harman and Rheingold (1984) are additional researchers and theorists currently focusing on intuition. Agor (1986), Catford (1987), Goldberg (1983), Herrmann (1982), and Simonton (1980) have all addressed the use of intuition in organizational and business settings. Both Harman and Rheingold (1984) and Luconi, Malone, and Scott Morton (1986) project an increased interest in the topic in the future. They mention our potential for using intuition as well as such forces as increasing globalization and technological developments as driving factors.

There is evidence of increased interest in this topic by both practitioners and researchers in the field of adult education and in related fields. For example, sessions on this and related topics held at the American Society of Training and Development (ASTD) national conference over the last several years have drawn large numbers of interested practitioners, and the ASTD “Brain Trainers’ Network” has grown to 1,200 members in only six years. Since 1988 the National Conference of the National Society for Performance and Instruction has featured a Human Possibilities Track that includes sessions on intuitive problem solving.

At the international level, the International Management Institute (IMI), in Geneva, has launched a global network to explore the role intuition plays in our work life. The network is exploring such questions as what is intuition, how we experience it, and how we can best access, evoke, and develop skills in intuition. This network is

establishing “nodes” of researchers on four continents. Parikh (undated), in an IMI research proposal which outlined the lack of existing research and the direction of the network's efforts, identified major gaps in the existing knowledge of intuition. One of the four areas relates specifically to questions about where intuition could be used or applied in the field of business and what could be the learning/teaching processes related to the use of intuition in business.

Research approach

Investigating intuition

Part of the challenge of investigating intuition is to determine what is possible to study. As discussed above, there is no consensus in the literature on what intuition is or how we use it. Some see intuition as a way of knowing (Vaughan, 1979), others as a personality attribute or style as did Jung, still others as a process of thought (Bastick, 1982). One reason for this lack of consensus is that intuition involves our thought processes and therefore is difficult to study. Another reason seems to be based on the presumption that intuition is an irrational process and thus not knowable in a scientific way. Bastick (1982), for example, points out that the most prevalent characteristic he identified about intuition was that it was in contrast to rational thought. Dreyfus and Dreyfus (1984) claim that by stating that intuition was not rational, scholars have fallen into the trap of putting it beyond the knowable.

Our ability to study thinking and behavior and to perceive that intuitive processes can be better understood seems to be increasing. On one hand, technology and research

approaches are being developed to better understand both the physical aspects of human nature and to interpret human behavior in a variety of systematic and objective ways. Thus, such vehicles as computers and ethnographic or anthropological techniques are now available for use. On the other hand, perspectives are shifting, enabling people to see the possibility of investigating a more complex array of systems which may be non-linear and non-rational. Harman and Rheingold (1984), for example, point out that science neglected to study intuition in the past. But they claim that Karl Popper's categorization of science into physical, life, and human sciences may provide the perspective needed for future exploration.

The approach

Thus, growing interest, more available tools and techniques, and a more open perspective make the topic more accessible. But how does one proceed?

The approach used in this dissertation is a qualitative case study which employs written journal entries and in-depth, focused interviews to gather data. Data analysis includes a variety of content analysis techniques and the constant comparison method (Glaser and Strauss, 1967). The focus is on description and interpretation.

The study's emphasis is on identifying strategies and tactics people use to access intuition, not on the process of intuition itself. Ericsson and Simon (1984) in *Protocol Analysis* argue convincingly that analysis of verbal data is much stronger when people are reporting on something they can identify or describe (such as their actions) than when they provide information on something about which they may have little explicit

awareness (which could be the case with intuitive processing). Thus, people were asked to describe the specific actions they took immediately prior to and during the time they experienced an anticipatory intuition.

This study looks at the actions of a specific group of people—Human Resource Development (HRD) professionals with extensive experience in the field. In addition, most of the participants played some type of management role in their organization. This group was chosen because the work of an HRD management professional usually includes complex, ill-structured problems, ones which Agor (1986) and others claim involve intuitions. Also, the group is considered able to articulate the issues and to have an interest in participation.

Some definitions of intuition

The following definitions of intuition, anticipatory intuition, problem, problem solving, strategy, and tactics are used in the study. The definition for intuition was included in the Participant Instruction Booklet (*Appendix A*). Terms such as anticipatory intuition, strategies, tactics, and ill-structured problems discussed below do not appear in the Participant Instruction Booklet (*Appendix A*) to avoid presenting too much jargon to the participants. However, during each of the initial interviews with study participants, the types of complex problems appropriate for participants to focus on were discussed.

Intuition—A type of immediate cognition. As described by Fischbein (1987), intuition has the characteristics of self-evidence, extrapolativeness, coerciveness, and globality.

Anticipatory intuition—This study focuses on what Fischbein (1987) calls *anticipatory intuitions*. According to Fischbein, anticipatory intuitions occur when a problem solver has a global view of the solution and a strong feeling the solution has been reached, but has not yet completed an analytical detailed solution. Anticipatory intuitions occur at the *moment of solution*.

Problem—As defined by Bastick (1982, p. 376), a problem is a “situation which contains discordant stimuli tending to give conflicting responses.” These discordant stimuli are some of the elements that form the problem. Each element evokes a different emotional set in us. In every day situations, we may not be aware of differences in these emotional sets. However, in problems which loom larger, we are more aware of the discordance.

Problem solving—Problem solving is moving from a situation where a person has no solution to a concern/issue to a state where a solution is visible/apparent. Bastick (1982) contends that the problem is solved when the original dissonance we feel is resolved. The “solution” enables us to resolve the dissonance and all problems are categorized in one context with its emotional set having concordant, consistent responses.

Strategies—Strategies refer to specific *conscious actions* people take to access their intuition. According to Gerber (1983), a strategy is most usefully understood as the skillful, deliberate, and coordinated use of problem-solving tactics.

Tactics—Gerber defines tactics as “skills, clusters of related skills, or expeditious procedures associated with solving specific types of problems” (p. 256). Tactics are specific actions people take to access intuition. Unlike strategies, these are not planned, but they may be habitual.

The dissertation focuses particularly on strategies used to access intuition to solve *ill-structured problems*. Silverman (1985) and others argue that managers use intuitive processes to solve ill-structured problems. Ill-structured problems have the following characteristics: they are not routine and well-defined with standard conditions; they are not easily solved by immediate application of well-known procedures or decision rules. According to Silverman, executive decision making and diagnostic evaluations by project managers are examples of the type of ill-structured problems found in the workplace.

The question

The primary question of the study is: “What strategies and tactics do people use to access intuition when solving complex, ill-structured problems?” The research design requests participants to focus specifically on *complex problems* when answering the question, and the Participant Booklet provides some examples of areas where human resource development professionals/managers could find complex, ill-structured problems.

Summary and organization of the study

Thus, intuition is a central factor of our lives and one which we can profit from learning more about. Scholars and scientists have pursued their understanding of what *Webster's New Riverside Dictionary* calls "the act of knowing without the use of rational process: immediate cognition, knowledge" applied by the use of this faculty, acute insight. Indeed, investigation of intuition especially in the business sector is on the rise.

This study grew from a desire to better understand the phenomenon of intuition. The study query is related to the broad question, "What can human resource development professionals do to enhance the use of intuition in problem solving?" The study examines actions 11 human resource development managers took to solve complex, ill-structured problems. In doing so, it adds a small piece of empirical research to the recently growing body of literature on intuition. The study is distinctive in that it approaches the issue of intuition's use in problem solving from an information processing perspective developed by such researchers as Newell and Simon (1972). Thus, participants were specifically asked to report on actions to solve the complex, ill-structured problems considered more likely to require accessing intuition (Agor, 1986; Silverman 1985). The study is also differentiated by its focus on real world situations rather than laboratory cases. Hence, the use of qualitative case study analysis (Merriam, 1988).

This chapter introduced the topic and identified the need for investigation. Chapter 2 examines existing research and links this study to past and current exploration efforts. Chapter 3 describes the method. In Chapter 4, a series of vignettes documents findings on a case-by-case basis. Chapter 5 is divided into three parts: Part 1 reports

findings from participants' journals comparing data across cases; Part 2 incorporates findings from a content analysis of both journals and interviews; and Part 3 presents an analysis of the dynamics of accessing intuition. Finally, Chapter 6 presents a summary of results and a discussion of implications.

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

Intuition is a topic that has been discussed by many throughout the ages, but it has been addressed from many different perspectives. One of the difficulties in studying it has been the lack of a precise, coherent meaning (Westcott, 1968; Fischbein, 1987). Moreover, its very definition, “the act of knowing without the use of rational process” (*Webster’s New Riverside Dictionary*), has, to some extent and for some thinkers, put it outside the boundaries of that which can be known (Dreyfus and Dreyfus, 1984). Thus, the literature on intuition has been pervasive but not precise. Additionally, there are few studies of intuition focusing on its use in problem solving.

Thus, while there is a recognition that intuition exists and plays some role in problem solving, the lack of consensus on what intuition is and how it works, as well as how it can be studied, has resulted in a paucity of detailed research. At the same time, however, demand for information on how we use intuition in problem solving accelerates (Goldberg, 1983; Isenberg, 1984). This study’s focus on the tactics and strategies people use to access their intuition provides empirical data that can be used as part of ongoing research on intuition and its use in problem solving.

The literature review delves into a number of different fields of study and brings together many different perspectives. While it unearths no other studies specifically addressing this question, it provides a background on intuition and its role in problem solving. The review also evidences an increasing interest in understanding how intuition

works as well as a belief by some that problem solvers may be able to influence the use of intuition to a greater extent than was formerly believed possible.

Literature review process

Past research efforts

To explore the use of intuition in problem solving, I conducted an extensive literature search, building on the work of Tony Bastick (1982). In April of 1978, Bastick made an exhaustive computer-assisted literature search of five conglomerate files seeking articles with the word intuition as a title or description: *Eric* from 1966; *Biosis Previews* (Biological Abstracts and Bioresearch Index) from 1972; *Ismec* (Information Services and Mechanical Engineering) from 1973; *Psychological Abstracts* (American Psychological Association) from 1967; and *Comprehensive Dissertation Abstracts* from 1861. Bastick's scan covered the titles and descriptions of 2,692,000 articles, reports, and theses for the word intuition. Only 91 had the word intuition in the title or as a descriptor, and only 24 were studies of intuition.

In April of 1987, I retraced some of Bastick's steps, finding more than 400 citations. I examined the nine-year period from 1978 to 1987 looking in *Eric* and *Psychinfo*, and *Social Sci-Search*. Using the word "intuition" as the search key to be found in either the title or descriptor words, in *Eric*, 92 citations were located. The search in *Psychinfo* yielded 203 cites with the word "intuition" in either the title or the descriptor words in *Social Sci-Search*, (p. 109). To select materials for review, I combined the cites

for “intuition” with the words “problem solving,” with “business,” and with “manage” or “management.”

Extended literature review

During the fall and winter of 1988, I extended my literature review in a variety of ways. First, a comprehensive, computer-assisted survey of relevant databases was conducted. Databases included were: *Eric* from 1966 to November 1988; *ABI/Inform* from 1971 to November 1988; and *Psychinfo* from 1967 to September, 1988. Descriptors included intuition, or meta-cognition, combined with problem solving, or decision making. The abstracts generated (*Eric*, 217; *ABI/Inform*, 131; and *Psychinfo*, 71) were then reviewed and categorized. The following criteria were used: how directly they related to this topic of intuition and problem solving, how recently they had been written, whether or not they had been written by an authority in the study area or another area, and whether I knew the work itself to be a seminal piece. On the basis of these criteria, I established six categories: Not related, not sure about relationship, somewhat related, definitely worth a look, appears closely related, and “a find.” The articles in the last three categories then served as the foundation for this extended review. Those in the next two categories were re-examined, and some of those works were then included in my extended review.

A similar process was followed in searching dissertation abstracts from 1861 to the present and in using the Library of Congress Information System for relevant dissertations and books. A limitation of this search is that the computerized database for books at the Library only includes titles entered before 1968 and does not include the most recent works. However, key citations in more recent works have lead to books written before

1968. In addition, I have kept up-to-date on recent publications through, for example, reading specialized newsletters such as the *Brain-Mind Bulletin*.

Intuition's many faces

One of the most fundamental issues emerging from this investigation is the lack of a clear consensus of the definition of the term “intuition.” To clarify such issues as how intuition works and how it is developed or released, consensus on a more precise definition is needed. Words like inference, insight, and vision are often used interchangeably with intuition. Moreover, people view intuition in a variety of diverse ways. Is intuition a way of processing information—an activity of the “right brain” that stands in opposition to the analytical function? Is it so compelling as to be a personality style, and is its use restricted—relying or depending on some inner preference? Is intuition a way of knowing? A domain of knowledge?

This lack of an overriding and clear framework of intuition causes confusion. This occurs especially when comparing or contrasting perspectives or when trying to generalize from the research. Completing that framework and clarifying the definition is beyond the scope of this paper. However, some perspective is needed. Others (Westcott, 1968; Vaughan, 1979; Simonton, 1980; Bastick, 1982; Goldberg, 1983; and Fischbein, 1987) have provided comprehensive overviews on the literature on intuition and interested readers may find their works particularly helpful. An overview of the principal themes gleaned from their work and others is presented here.

Westcott's landmark study (1968) discusses the concept of intuition as presented in philosophy and psychology, defines intuition, and presents an empirical study identifying different styles of use. Vaughan (1979) presents a conceptual psychological perspective and suggestions for developing the use of intuition. Bastick's (1982) review of the literature from 1968 to 1978 delineates the characteristics of intuition and Bastick's theory on how intuition works during problem solving. Goldberg's *The Intuitive Edge*, (1983), argues for the development of the use of intuition in management decision-making, synthesizes much of the literature into a format for popular consumption, and, building on Vaughan, provides suggestions for individuals to develop its use. Simonton (1980) reviews the literature and describes the intuitive process, again focusing on intuition as a style of thinking. Finally, Fischbein (1987) provides a well thought-out framework for classifying intuition, links his framework to earlier research, and presents a theory about why intuition continues to be important to human thought and behavior.

Indeed, the most consistent theme in the literature is that intuition as a concept stands the test of time (Fischbein, 1987). A topic considered by the ancient Greek philosophers, intuition still intrigues philosophers, psychologists, and logicians alike. According to Plato, "induction operating on the sensory world can yield conceptions, intuition operating on conceptions can yield ideas." (cf. Westcott, 1968, p. 3). Fischbein (1987) contends that intuition has been used to understand, to learn, to know, and to solve problems; and that its most significant value might be the creation of a certitude of thought about mental constructs or ideas necessary for human beings to be able to pursue those concepts. The meaning of intuition has changed over time, and is also dependent upon the particular field of the thinker. Today, both earlier and more recently developed meanings are evident in the literature. But, in general, a shift can be seen from a concept of intuition

as a mysterious way of knowing, toward a view of it as a human function that may be observable and that may be developed or released.

Pre-1968 perspectives

Early thinkers dealt with intuition from an epistemological viewpoint. They saw intuition as a way of knowing. Westcott (1968) identified two philosophical schools concerned with intuition. He called the first group, illustrated by Bergson, Spinoza, and Croce, *classical intuitionists*. These *classical intuitionists* were concerned with finding ultimate truth. They saw intuition as a “special method for attaining special truth.” To them intuition was independent of, or even opposed to, reason or intellect, and truth reached by intuition can never be reached by reason. Thus, reason could never verify or refute intuition. The second group, *contemporary intuitionists*, sees intuition as “immediate apprehension of justifiable belief.” Represented by Stocks, Ewing, and Bahm, these philosophers saw intuition more allied with reason and asserted that while reason cannot prove the truth of intuition, it can support the intuition.

These two viewpoints can be aligned to the two differing views of the world labeled intuitionism and empiricism. Philosophers, as well as psychologists, split along a very fundamental question, “Is there one reality or are there multiple realities to be discovered?” In the growing field of psychology, intuition fell prey to the battle between the intuitionists who viewed every human situation as unique, and the psychometrists who believed in describing and interpreting behavior on the basis of shared characteristics. According to the intuitionists, we understand personality by way of direct, holistic, interpretative observation of one human being by another; psychometrists would employ the

measurement of separate single aspects of an individual under controlled impersonal conditions (Westcott, 1968). Thus, in the 1930s, the goal of the institutionalists was *verstehen*, or global understanding; psychometrists were intent on prediction.

This conflict in scientific approach seems to have held sway to the present. Witness the frequently heated debates about the merits of quantitative versus qualitative research or statistical versus phenomenological studies! Indeed, Goldberg (1983) asserts that for over three centuries the prevailing model for gaining knowledge in the Western world has been *scientism*. According to scientism, the right way to approach knowledge is with a rigorous interchange of reason and systematically acquired experience. He claims:

This philosophy, developed as a hybrid of rationalism and empiricism, holds essentially that the experience of the senses is the only reliable basis for knowing. Rationalism contends that reasoning is the prime avenue to truth. In science, empirical information and reason are supposed to work in tandem, each acting as a check on the other's shortcoming. Since experience can be deceptive, information is scrutinized with vigorous logic; since reason is not entirely flawless, tentative conclusions—hypotheses—are put to the empirical test with controlled experiments subject to repeated verification. For the most part, . . . intuition has been only a peripheral concern in the West (p. 17).

Westcott claims that, with the exception of Carl Jung, most early psychologists did not even use the word intuition and that the reader must look at such topics as perception, interpersonal judgment, and personality style to investigate psychological perspectives. Jung proved a major exception, embedding his concept of intuition as a function within his

general theory of personality. To Jung, intuition is one of four functions people use to perceive and act on reality. Intuition is the process of perceiving immediately and unconsciously the possibilities and potentialities of the objects which are the focus of attention, internal or external. Other functions are *sensing*, *thinking*, and *feeling*. This view of intuition as a process of perception linked to personality style remains a powerful concept in today's world. Moreover, the development of the Myers-Briggs Type Indicator and its widespread use has created both a body of research and a popular culture in some organizations which use the instrument. For many in the training field, for example, the word intuition is associated with Jung's and Myers-Briggs Type Indicator's interpretation of intuition as a perceptual function.

While Jung linked intuition to a special kind of perception, other psychologists have viewed it in terms of unconscious inference or in terms compatible with such a position (Westcott, 1968). Westcott concludes that psychology sees intuition as a special use of inferential thinking, a position not inconsistent with the views of Bastick (1982), Simonton (1980), and Fischbein (1987). His own definition is that intuition is "reaching conclusions on the basis of less explicit information than is ordinarily required to reach that conclusion" (p. 98).

Westcott's series of 11 studies over 10 years involved 1,097 subjects and is considered to be the most extensive empirical research on intuition (Goldberg, 1983). Westcott asked college students to solve pre-established problems involving series and analogies for which each had a single correct answer. For example, the problems asked subjects to complete a series of ratios. Looking at two variables, how many clues the subjects required, and how correct the conclusions were, Westcott found differences in the

subjects' ability to reach accurate conclusions on conceptually inadequate information and related these differences to personality style. He identified four styles of intuitive behavior that correspond quite closely with Jung's styles. They are:

1. Intuitive thinkers: little information, highly successful in finding solutions.
2. Wild guessers: little information, but typically unsuccessful.
3. Cautious successes: excessive information, and highly successful.
4. Cautious failures: unsuccessful despite excessive information.

Thus, Westcott found that there were differences associated with personality characteristics in people's ability to reach accurate conclusions on what is conceptually inadequate information. As the first major empirical research on intuition and as a thought-provoking history and conceptualization of the topic, Westcott's 1968 work, *Toward a Contemporary Psychology of Intuition*, remains unsurpassed.

The past 20 years

The past 20 years have seen an increase in the sheer volume of works written on intuition. Movement towards more precise and more comprehensive definitions of intuition has occurred. Interest in the role of intuition in problem solving and decision making

mounts. Westcott (1968) reported finding less than 65 references to intuition in *Psychological Abstracts* from 1927 to 1968. Most were philosophical discussions. Bastick (1982), searching *Eric Previews* and ISMEC in addition to *Psychological Abstracts* from 1968 to 1978, found 91 citations on intuition and 24 studies. A 1987 search through much of the same data, and with a 1978 begin point, yielded about 400 citations with intuition in either the title or descriptor words. Thus, the total number of references is increasing. Westcott found less than 65 from 1927 to 1968. Bastick found 91 more in the next decade, and I located 400 in the ensuing nine years.

In studies since 1968, writers and researchers have discussed the value of intuition in problem solving, investigated its characteristics, developed varying precise definitions in behavioral terms, and created different types of classifications of the term. For example, Mintzberg (1976), Silverman (1985), Agor (1986), and Isenberg (1984) have attested to the value of intuition in business decisions. Mintzberg pointed out that “key managerial processes seem to be more relational and holistic than ordered and sequential, and more intuitive than intellectual” (p. 53). Silverman noted that one of the characteristics of successful NASA project managers is a well-developed sense of engineering judgment or intuition. Agor’s study of 3,100 top managers shows that they relied on their intuition much more than mid-level managers.

Bastick (1982) attempted to find a precise meaning of the terms “intuition” and “insight” but found none. Quite the contrary, he identified many. Some definitions were metaphysical, some mystical. Some even defined intuition as something that can’t be defined. One of Bastick’s contributions was to analyze the existing theoretical and common usage descriptions to identify the properties commonly associated with intuition.

He discovered what people perceived intuition to be. He enumerated 20 properties. These were then compared to the literature on intuition and insight. Based on the number of references to each property, using rank order correlation, he decided priority of the property within a category.

Table 1 lists the properties Bastick identified by the number of references he found within the literature he reviewed. Those properties he found with 10 or more references included: contrast with abstract reasoning, logic, or analytic thought (16); sense of relations (16); recentering (13); influence by experience (12); emotional involvement (10); and preconscious process (10).

As a result of this research, Bastick saw intuition as a process of thought and behavior which involved such properties as emotion, a sense of relations, and preconscious or infraconscious mental processes. Simonton (1980) similarly saw intuition as process. In his view, intuitive thoughts are “behavioral adaptations to the environment which tend to be unconscious, ineffable, and essentially probabilistic in character” (p. 6).

Both Isenberg (1984) and Goldberg (1983) grouped the types of activities in which people engage intuition. Isenberg, after spending from 1 to 25 days per executive in an in-depth study of 12 executives, found five types of situations in which executives use their intuition. They are:

1. To sense when a problem exists
2. To perform well-learned behavior patterns rapidly

Table 1

Properties of Intuition

<u># Refs</u>	<u>Name of Property</u>
16	Contrasting w/abstract reasoning, logic, or analytic thought
16	Sense of relations
13	Recentering
12	Influence by experience
10	Emotional involvement
10	Preconscious process
8	Subjective certainty of correctness
8	Global knowledge
7	Transfer and transposition
6	Understanding by feeling
6	Empathy, kinesthetic or other
5	Preverbal concept
4	Quick, immediate sudden appearance
4	Associations with creativity
4	Intuition need not be correct
3	Associations with egocentricity
3	Hypnogogic reverie

(table continues)

Table 1

Properties of Intuition (continued)

2	Innate, instinctive knowledge or ability
2	Incomplete knowledge
1	Dependence on environment

Source: Bastick, T. (1982). *Intuition: How We Think and Act*. N.Y.: Wiley.

3. To synthesize isolated bits of data into an integrated picture
4. As a check on the results of more rational analysis
5. To bypass analysis and to come up with a solution

Goldberg's six-group categorization of the functions of intuition has some similarities to Isenberg's (see Table 2). The categories of discovery, creativity, and evaluation are consistent with Isenberg's third and fourth categories.

Vaughan (1979) and Condon (1987) provide internal classifications of intuition. Vaughan, building on the work of R. Gerard (Vaughan, 1979), suggests that we experience intuition on four levels: physical, emotional, mental, and spiritual. At the physical level, intuition is associated with bodily sensations; at the emotional level, with feelings; at the mental level, with images and ideas; and at the spiritual level, with mystical experiences. Condon (1987) bases a classification of intuition on the focus of the intuition, which may be personal, interpersonal, or transpersonal. His classification evolved from his experience as a therapist and from interviews with people from many walks of life who use their intuition successfully and routinely. According to Condon, personal intuition is knowledge from the personal unconscious that has been taken in, stored, and synthesized. Interpersonal intuition is information about other people derived from unconscious observation of their non-verbal behavior. Condon indicates that transpersonal intuition (also known as ESP), paranormal, or psychic phenomena, are intuitive information about situations, places, and people unknown to the personal unconscious.

Table 2

Goldberg's Functions of Intuitions

1.	Discovery	Here intuition reveals verifiable facts or supplies answers to a specific problem, or a more general need. Sometimes it is an insight, not a solution.
2.	Creativity	Dynamics similar to discovery, but deals with alternatives, options, or possibilities (not necessarily verifiable). Generates ideas that may be, more or less, appropriate; some alternatives are more suitable than others.
3.	Evaluation	Binary kind of go/no-go advice; works on specific question, also on the other products of intuition; writers and artists use; prompts feeling of certitude and self-evidence.
4.	Operation	Form of intuition that operates like a sense of direction and guides and prompts us to take certain actions; attractions can often be described logically, but are not logically derived; responsible for what seems like luck.
5.	Prediction	Explicit or implicit feeling about outcome of event or decision.

(table continues)

Table 2

Goldberg's Functions of Intuitions (continued)

6.	Illumination	This
	category transcends other five functions; has been called transcendence, self-realization, samadhi, satori, nirvana, cosmic consciousness, union with God; subject/object duality is dissolved; "transcendence can be viewed as the exemplar to which all other forms of intuition can be related."	

Based on: Goldberg P. (1983). *The Intuitive Edge: Understanding and Developing Intuition*. Los Angeles: Jerry P. Tarcher.

A major contribution

While Westcott (1968) brings the study of intuition to the surface of the field of psychology, Fischbein's *Intuition in Science and Mathematics* (1987) presents an integrated and comprehensive framework for continued study. Fischbein's work, completed after more than ten years of study, research, and teaching at the University of Tel Aviv, is based on an extensive literature review as well as on empirical investigations. His contributions to the research include a discussion of the characteristics of intuition (see Table 3), as well as a comprehensive classification (see Table 4). Fischbein points out that intuitive processing can be used to understand, to learn, to know, and to solve problems, and that these purposes influence our perspective on how intuition functions.

His work directly addresses use of intuition in the problem-solving process. One of the bases for Fischbein's classification of intuition is on the relationship between an intuition and the solution to a problem (see Table 4). If a problem is implicit, the related intuition is *affirmatory*. If the intuition is related to a problem solution but a person is not explicitly engaged in problem-solving activity, the intuition is *conjectural*. If both the solution moment and the problem-solving activity are explicit, the intuition is *anticipatory*. And if the problem solver has moved beyond an analytical search of a possible solution, the intuition is labeled *conclusive* (Fischbein, 1987). He also classifies intuitions by whether they developed without instruction (*primary*) or were acquired through educational activity (*secondary*).

Table 3

Fischbein's Characteristics of an Intuition

Self-evidence	Appears as directly acceptable, without the need for extrinsic justification or a formal proof.
Intrinsic certainty	Appears as certain; People express confidence that the idea is true (even when it may be erroneous).
Perseverance	Stable; resistant to alternative interpretations.
Coerciveness	Exerts a coercive effect on the individual's reasoning strategies; immature attitudes may survive even after individual has been provided with adequate representations and solutions.
Theory status	Expresses a general property perceived through a particular experience; is a theory expressed in a particular representation using a model.
Extrapolativeness	Extrapolates from immediately accessible data to information which exceeds observable facts.

(table continues)

Table 3

Fischbein's Characteristics of an Intuition (continued)

Globality	Is a structured cognition which offers a unitary global view; selection process tends to eliminate the discordant clues and organizes others in conformity with unitary compact meaning.
Implicitness	Based on complex mechanism of selection, globalization, and inference; are surface structure of tacit processes; tacit character explains the difficulty of controlling and influencing them.

Based on: Fischbein, E. (1987). *Intuition in Science and Mathematics*. Dordrecht, Holland; D. Reidel Publishing Company.

Table 4

Fischbein's Classification of Intuition

<u>Type</u>	<u>Definition</u>	<u>Example</u>
I. Based on roles—relationship between intuition and solution		
A. Affirmatory intuitions (<i>solution element is implicit</i>)	Representations or interpretations of various facts accepted as certain, self-evident and self-consistent; one affirms, claims something.	Two points determine a straight line.
Can be:		
<i>Semantic</i>	Refers to meaning of concepts which differs depending on context.	In behavioral terms, a "straight line" is the shortest distance between two points; in a physical sense, a light beam.
<i>Relational</i>	Expresses apparently self-evident, self-consistent statement about relationships, some correct, others not, but we tend to accept all as self-evident.	The whole is bigger than its parts; a heavier object falls faster than a lighter one.
<i>Inferential</i>	Logical inference where relationship between premise and conclusion is accepted as self-evident.	

(table continues)

Table 4

Fischbein's Classification of Intuition (continued)

<u>Type</u>	<u>Definition</u>	<u>Example</u>
<i>Inductive</i>	Intuitively generalizing; affirm whole category of elements possesses property.	
<i>Deductive</i>	Deducing directly as a self-evident conclusion.	
<i>Ground</i>	All basic representations and interpretations which develop naturally in a person; shared by all members of a certain culture.	Space and time represent actions; causality.
<i>Individual</i>	Personal representations related to people's life and activity.	"I don't believe x's promises."
B. Conjectural <i>(solution aspect is explicit, but not involved explicitly in a solving endeavor)</i>	Expresses assumptions about future events; must be associated with a feeling of confidence.	
These are:		
<i>Lay</i>	Based on everyday experience, not expertise.	"This child will be a brilliant mathematician."

(table continues)

Table 4

Fischbein's Classification of Intuition (continued)

<u>Type</u>	<u>Definition</u>	<u>Example</u>
<i>Expert</i>	Specialists convert apparently obscure, non-salient aspects of a situation into relevant messages; may be done automatically before systematic analysis.	
C. Anticipatory <i>(problem solving; both the solution moment and the problem-solving frame-work are explicit)</i>	Represents preliminary global view which precedes the analytical, fully-developed solution to the problem; appears as a discovery and the (apparently) sudden result of a previous solving endeavor; conjecture appearing as a plausible truth.	Moment of scientific discoveries, i.e., DNA.
D. Conclusive <i>(problem solving; individual already beyond the analytical search effort which has followed the initial anticipatory intuitive flash, and solution appears</i>	Summarizes in a global, structured vision, the basic ideas of the solution to a problem previously elaborated.	

(table continues)

Table 4

Fischbein's Classification of Intuition (continued)

<u>Type</u>	<u>Definition</u>	<u>Example</u>
D. Conclusive (continued)		
<i>intuitively closed and intrinsically, directly acceptable)</i>		
II. Based on origins (concerns mainly affirmatory intuitions)		
A. Primary	Develops independently of any systematic instruction as an effect of personal experience.	
Can be:		
<i>Ground</i>	All basic representations and interpretations which develop naturally in a person; shared by all members of a certain culture.	Space and time represent actions; causality.
<i>Individual</i>	Personal representations related to people's life and activity.	"I don't believe x's promises."
They are:		
<i>Pre-operational</i>	Appreciation is intuitive, global, without hesitation, based on configurations rather than operational criteria.	Child believes that by altering the form of clay, one alters quantity, weight.

(table continues)

Table 4

Fischbein's Classification of Intuition (continued)

<u>Type</u>	<u>Definition</u>	<u>Example</u>
<i>Operational</i>	New intuitions based on the composability and reversibility of intellectual operations; in many situations, interpretations appear self-evident although the operational structure has become essential texture.	Notions of numbers and cardinality; class relationships, related order, and seriation.
B. Secondary	Acquired through some educational intervention; often inconsistent with the corresponding primary intuition relating to same concepts.	Principle of inertia.

Based on: Fischbein, E. (1987). *Intuition in Science and Mathematics*, Dordrecht, Holland; D. Reidel Publishing Company.

Fischbein's framework, while not addressing every issue in the literature about intuition, is comprehensive enough to provide a framework that incorporates, or is not inconsistent with, other findings. For example, he discusses lay and expert intuition as do Dreyfus and Dreyfus (1984) but differentiates between conjectural and problem-solving intuitions, allowing us to study the two separately. His theory on intuition posits that intuition is a process allowing human beings to obtain in the world of ideas a sense of certainty and self-evidence that makes ideas and problem solutions behaviorally meaningful. He sees the concept of intuition as expressing a fundamental and consistent tendency—quest for certitude. To Fischbein, intuition is a special type of cognition characterized by self-evidence and immediacy.

Intuition and problem solving

As Fischbein indicates (1987), intuition as a human behavior occurs within a context or setting. This study addresses intuition within the context of problem solving. Moreover, the study's approach can be more associated with an information processing perspective. Additionally, it focuses on using strategies and tactics to access intuition within a particular setting—that of an ill-structured problem.

Problem solving and problems

This study looks at problem solving from an information processing perspective and at problems as occasions where a person is confronted with dissonance that requires resolution (Bastick, 1982) or, for example, with a situation in which he wants something and does not know immediately what series of actions to perform to get it (Newell and

Simon, 1972). Problem solving is moving from a situation where a person has no solution to one where a solution is apparent. It involves the resolving of discordance and the categorization of all problem elements in the same emotional set (Bastick, 1982).

Information processing

The information-processing model is one of three basic psychological models used to study problem solving (Moskol, 1980). The other two models are operant-behaviorism and Gestalt-cognition. Operant behaviorists analyze problem solving in terms of discrimination learning, emphasizing trial and error behavior, habit-family hierarchies, operantly conditional responses, chains of associations, and response transfer (Davis, 1973; Moskol, 1980). Gestalt-cognitive psychologists such as Wertheimer, Dunkner, and Bruner, view problem solving as a process of organizing previous learning to gain insight (Moskol, 1980).

Information-processing theorists began emerging as a separate group after World War II, drawing on the gestalt-cognitive tradition and the development of formal logic and cybernetics (Newell and Simon, 1972). According to Newell and Simon (1972), the logician's contribution has been to demonstrate that the manipulation of symbols can be described in terms of specific concrete processes. This makes symbols tangible, and, as Fischbein does, creates a language to describe problem solving and decision making. Cybernetics, beginning in the post-World War II period, introduced such elements as information theory, the concept of feedback systems, and the electronic computer.

Information-processing theory views problem solving as an interaction between a human or an information-processing system (IPS) and a task environment—the situation in which a goal, problem, or task is perceived by the IPS (Newell and Simon, 1972). According to Newell and Simon, the information-processing system operates primarily in a serial fashion and has a limited short-term memory, yet has access to a virtually unlimited, associatively organized long-term memory (Moskol, 1980).

Well- and ill-structured problems

Problem solving involves taking physical, perceptual, and mental actions to reach a goal. It involves creating mental representations in a “problem space” and using specific strategies or heuristics. In many cases, problems are broken into sub-problems.

Some problems are well-defined—a test exists performable by the information-processing system that will determine whether a proposed solution is in fact a solution. Such well-defined problems have been called puzzles (Churchman, 1971). Note that “puzzles are mental exercises concocted so that one model or way of thinking, is the appropriate pathway to the solution (p. 144).”

Puzzles or well-defined problems differ significantly from ill-structured problems, both in the way they are knowable and in the decision-making procedure required to solve them (Kitchener, 1983). “All the elements for a puzzle are knowable and known and there is an effective procedure for solving it” (p. 224). Puzzles do not require considering alternative arguments, seeking out new evidence, or evaluating the reliability of data and sources of information. They contrast with “the richer problems of every day life . . .

(where). . .one of the most difficult aspects of problem solving is the discrimination of whether or not a solution has occurred. . .in social problems like pollution and poverty, there is no authorized source for terminating the inquiry” (Churchman, 1971, p. 144). Solving ill-structured problems, however, involves determining which set of theoretical assumptions best fits a problem or redefining a problem in such a way that opposing perspectives are synthesized into a framework (Rescher, cf. Kitchener, 1983).

Linking intuition and ill-structured problems.

An important feature of this study is that it links an investigation on intuition to its use in the setting of ill-structured problems rather than well-defined ones. This linkage has been implicitly and explicitly made by others (Westcott, 1968; Agor, 1986; Silverman, 1985; and Luconi, Malone, and Scott Morton, 1986).

Although Westcott (1968) used a “puzzle” as the task for his empirical investigation, he clearly saw the type of complex problems that Newell and Simon labeled ill-structured as appropriate grist for intuition. Asking the question, “When is the ability to act intuitionally a virtue?”, he replies that we must look to “situations in which information, explicitness, and redundancy are just not available” (p. 191). For example, he suggests we look to the frontiers of knowledge where the ability to solve problems on minimal information is the only way that problems can be solved:

As long as detail, redundancy, and explicit information are necessary to an individual, he will be incapable of going beyond the frontiers. The “major

breakthrough” can be seen as the solution to a problem for which apparently only insufficient information is available (p. 191).

Westcott calls for the study of the generality of intuitive thinking in a variety of “real world” situations.

Agor (1986), again not directly using the word ill-structured, lists the type of situations in which executives report using intuition. These circumstances include situations where facts do not clearly indicate the direction to take, where trends are emerging, where several alternative solutions exist, and where there is uncertainty and little precedent.

Silverman (1985) not only explicitly makes the connection between ill-structured problems and the use of intuition, but provides specific examples. These include innovation, executive decision making and diagnostic evaluations by project managers, or “any other situation where neither the goal nor the procedure for accomplishing the goal are well understood at the outset” (Silverman, 1985, p. 29). He asserts that in ill-structured problem settings, the intuitional thought processes associated with expertise are being “deleteriously affected by formalisms such as rigid organizational structures, strictly logic-oriented education programs, and analytical problem aids.”

Luconi, Malone, and Scott Morton (1986) suggest an even more clearly significant role for intuitive processes in the future. In their discussion of expert systems, expert support systems and decision support systems, they emphasize that although computerized systems now exist to solve structured problems, managers will continue to face

ill-structured problems. Figure 1 illustrates their view of how people and computers might be integrated in the problem-solving process:

- Data processing systems can solve Type I or fully-structured problems.
- Decision support systems can deal with less fully-structured, Type II problems, with computers doing part of the work (for example, applying standard procedures) and humans other parts (choosing the procedures).
- For Type III problems where expert systems are used, computers can use flexible problem-solving strategies when all the relevant knowledge can be programmed into them. However, it is impossible or impractical to encode all the relevant knowledge experts need to solve unstructured problems.
- In Type IV problems, expert support systems help human users who can easily inspect and control the problem-solving process.

Then, ill-structured problems, because they involve insufficient data and cannot be solved by applying a set of rules, may be particularly suited to evoke intuitive processing. By their nature, they may be able to provide situations which call on people to access their intuition.

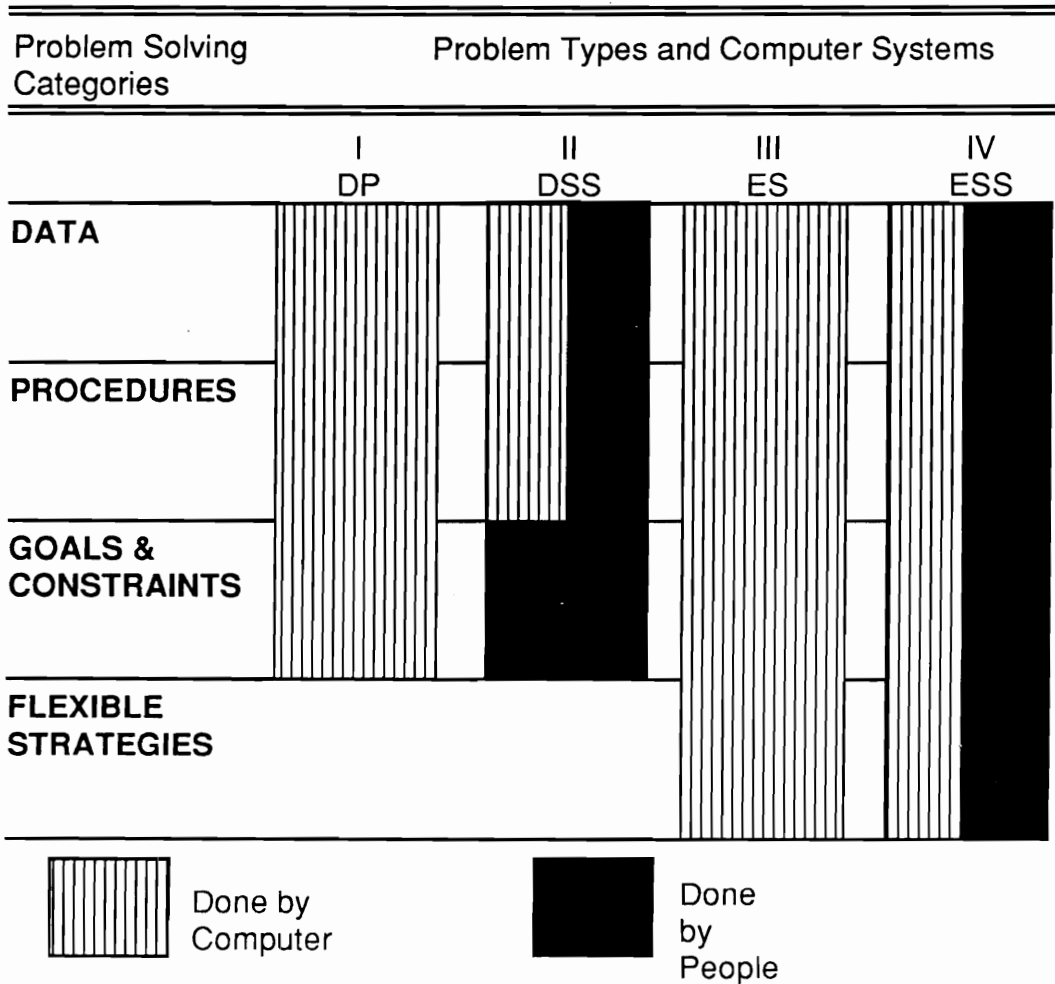


Figure 1

COMPUTER - HUMAN INTERACTION IN PROBLEM SOLVING

Reprinted from Expert Systems: The next challenge for managers by Luconi, F. L., Malone, T. W. and Scott Morton, M. S., *Sloan Management Review*, 27 (4), 1986, 3-14 by permission of the publisher. Copyright 1986 by the Sloan Management Review Association. All rights reserved.

Intuition as a problem-solving process

Central to gaining an understanding of the strategies people use to access their intuition is a familiarity with intuition as a process. Reviewing the literature from this perspective, two key questions emerge: What is the relationship between intuition and emotion? What is the relationship between intuition and consciousness?

The relationship between intuition and emotion

Bastick (1982) understood intuition as a fundamental process of thought and behavior that results from the way people encode or decode information. He claims that people encode information emotionally. Thoughts and behaviors are the decoded versions of this information “which, associated by their continuous common feelings, tend to be recalled when we experience these emotions.” He further states:

Thought and behavior change as the subject drifts from one emotional stage to the next. The next emotional set occupied by the subject will tend to be the one which most overlaps the present emotional set. During the change, the duplicated response tendencies will be reinforced making the path of drift more probable in the future (p. 354).

This overlapping creates *redundancy* or duplicated information. In problem solving, the mind seeks to decrease the anxiety that comes with dissonance and to increase redundancy. Thought and behavior use redundant information which is encoded by the stimuli and responses that make up our feelings and is duplicated by our senses. Bastick

sees intuitive thought as *directed primary process thinking*, the result of combining highly redundant emotional sets. (Secondary-process thinking results from the combination of sparsely redundant emotional sets.) He sees the intuitive process working in three very different ways, depending upon three types of incubation periods.

1. *Hierarchical embedding.* This method occurs when we immediately intuitively solve problems by generalization. Given conflicting data about two different, but similar situations (or emotional sets), we might create a third situation (or set) that encompasses the two. For example, a child might have trouble adding three apples and two pears until she finds a new emotional set (fruit) which contains both (see Figure 2).
2. *Combining by continued drifting.* In this method, intuitions arise at the end of a *continuous period of work*. Problem solvers pass through a series of emotional sets. They retain the problem stimuli and look at it from different perspectives. As they drift, they also retain solution responses and drop irrelevant responses. Anxiety continually decreases and the problem solvers feel that they are working toward a solution even though it is unknown (see Figure 3).
3. *Drastic recentering.* This represents the third type of incubation situation. In this case the problem solver reaches a point where the problem can't be solved, leaves it, and later comes upon it. At that

point, an emotional set occurs that is so similar to the original set that the solution appears from out of the blue in a “Eureka” response (see Figure 4).

Bastick places strong emphasis on the use of both empathy and the will in using intuitive and creative thought. He claims that the organization of information by emotional sets requires the use of empathy to evoke feelings subjectively appropriate to the information and that empathetic projection is needed. He also claims that there is a “fundamental” difference between people—intuitive people have more highly redundant emotional sets open to them, and also need to be emotionally self-sensitive. Bastick believes intuition allows environmental stimuli to evoke conflict/response tendencies through empathy, and that creative people have an ability to change their ego states. He states that they can move from secondary processing to primary processing to resolve dissonance, and back again to analyze and verify the data they obtain.

Bastick’s theory seems supported by and/or consistent with other thinkers. For example, intuition has often been viewed as a spontaneous leap—the “Aha” phenomenon in which, like Athena from the mind of Zeus, an idea jumps fully formed from the void after a period of incubation. But Simonton (1980) found that intuition yields a slow gradual curve of knowledge acquisition prior to verbalization. Bastick’s concepts of *combining by continued drifting* (Figure 3) and *drastic recentering* (Figure 4) provide a framework for both occurrences. Furthermore, Bastick’s theory of *combining by continued drifting* explains the phenomena Simonton (1980) also discussed.

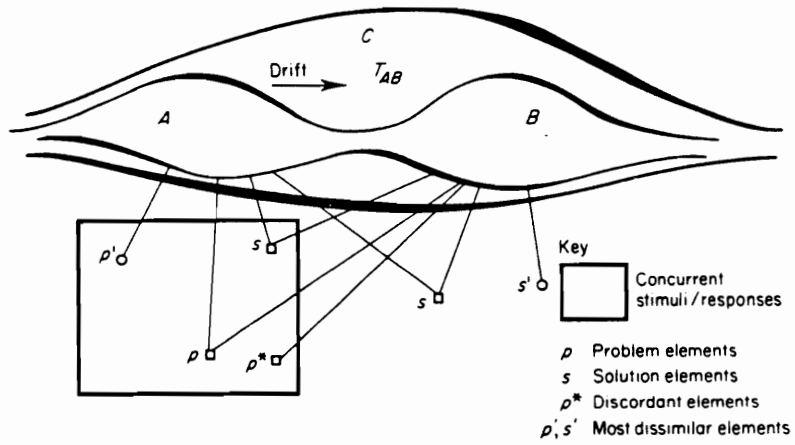


Figure 2

HIERARCHICAL EMBEDDING

Source: Bastick, T. (1982). *Intuition: How We Think and Act*.
New York: Wiley

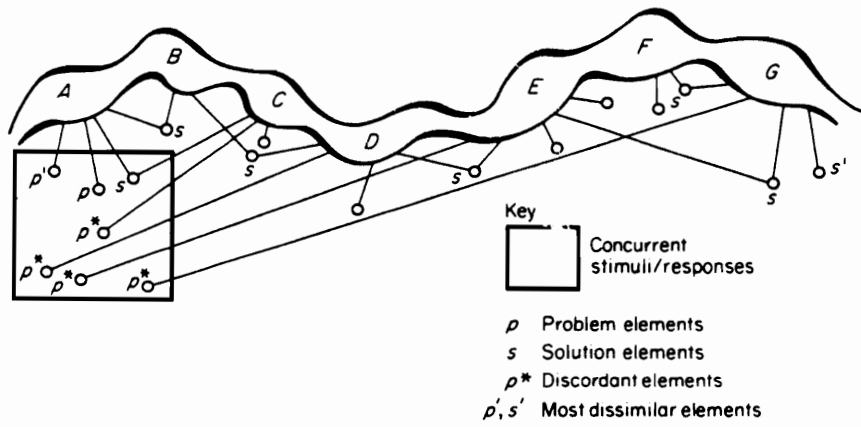
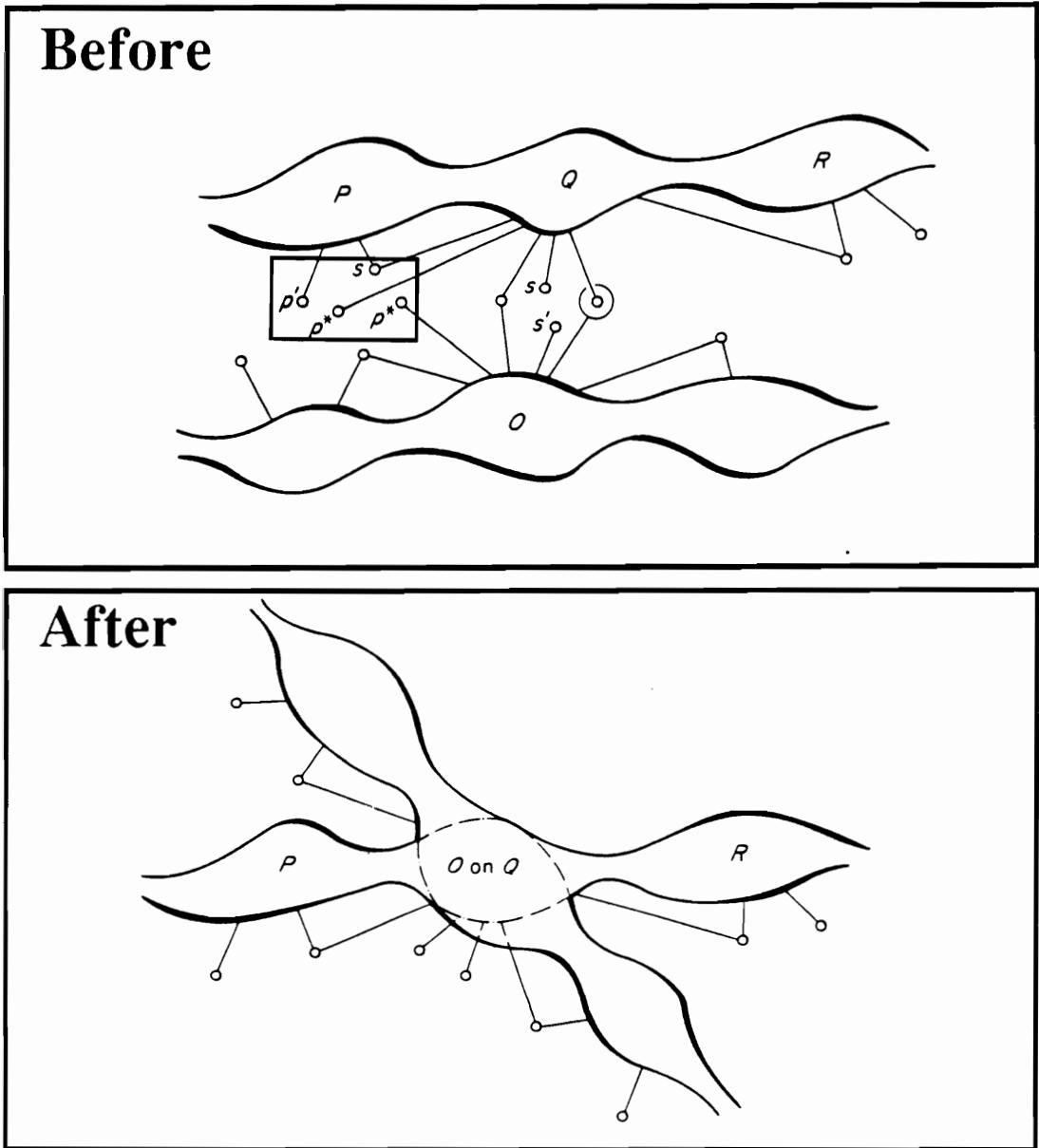


Figure 3
**COMBINING BY
 CONTINUED DRIFTING**

Source: Bastick, T. (1982). *Intuition: How We Think and Act*. New York: Wiley





- Key:
-  Re-experienced stimuli/responses contiguous with the present emotional set causing recentering
 -  Concurrent stimuli/responses
 - p* Problem elements
 - s* Solution elements
 - p** Discordant elements
 - p',s'* Most dissimilar elements

Figure 4
DRASTIC RECENTERING

Source: Bastick, T. (1982). Intuition: How we think and act. New York: Wiley.

Simonton posits two distinct forms of knowledge acquisition curves prior to verbalization, depending on the mode of information processing involved. According to him, the first mode of information processing—intuition—yields curves of continuous and gradual improvement, which would seem consistent with combining by continued drifting. The second, analysis tends to have curves of one or more discrete steps.

Others also discuss a significant role for empathy in intuition and the importance of the ability to change ego states. Slightly less than half of the 34 people Chinen, Spielvogel, and Farrell (1985) interviewed associated feelings with intuition and many correlated intuition with empathy. Some reported merger experiences. In one case a male analyst reported momentarily dissolving ego boundaries. Sinnott (in press) suggests, based on her observational research, that part of the adult's problem-solving repertoire might be the ability to create strange loops, a concept explored by Hofstadter and Dennett (1981) in *The Mind's I*. The premise is that the adult consciously decides to move to a higher level to deal with a problem, then moves down to a lower level to implement a solution.

The relationship between intuition and consciousness

Understanding the relationship between “conscious” and “nonconscious” thought seems critical to a fuller understanding of intuition. The idea of nonconsciousness implies that there is a barrier behind which people cannot go, and over which they have no control. One of the major blocks to using intuition and to conducting research in this area seems to be the assumption that intuition is unconscious or preconscious. A shift in perception here might open many avenues for use and research.

Chinen, Spielvogel, and Farrell (1985) found that while 94% of the 34 subjects they surveyed related that they used intuition in their work, they, particularly the women, were reluctant to voice intuitions explicitly. The researchers also found that individuals considered intuition to be normal, useful, and important to them personally, but slightly embarrassing, its use certainly not to be discussed. Their conclusion was that, "People use intuition to solve problems if they work alone and for themselves. In public, or for tasks another person has assigned them and to whom they are accountable, subjects use rational approaches: intuition shuns public exposure." (1985, p. 192.)

Chinen, Spielvogel, and Farrell go on to identify what they consider the chief cause of resistance:

To use intuition, we must attune ourselves to the indeterminate processes of the unconscious. This means giving up the distinctions we ordinarily use to organize our world. We therefore plunge into a realm where there are no definite objects or distinctions, like the world before creation. It is precisely that freedom which allows new connections to be made. However, surrendering our usual logical distinctions can be terrifying, and a dread of chaos seems to frighten many individuals away from intuition. (p. 195)

Simonton's work (1980) provides a framework for understanding, and venturing out into, the chaos Chinen, Spielvogel and Farrell mention. Based on a very thorough analysis of previous literature, Simonton claims there are four levels of human awareness, *attention, behavior, cognition, and habituation*, and that events or stimuli pass through the different thresholds discussed below to gain our attention or actions. Simonton contends,

as does Bastick (1982), that behavior and thought ultimately are associational. Simonton states that conditional probability—the ability to predict an event or actions when seeing another event—is a formal measure of associative processes. Associations may be strong or weak depending in part on the history of past events in the life of the individual. As a conditional probability increases in value, it passes through this series of thresholds that determine whether or not processes relegated to each successive layer can be enacted. Each layer has higher probabilistic requirements before an association can enter the corresponding level of processing. The thresholds and the key issues related to each follow:

1. *The threshold of attention.* Will the association between X and Y be strong enough to justify additional information processing? Low probability associations are ignored and are without phenomenological consequence; they stay buried and are “nonconscious.”
2. *The threshold of behavior.* Will the conditional probability be strong enough to have behavioral consequences? Reaching this level is the minimum requirement for perceptual expectancies, classical and operative conditioning, generalization or discrimination. This is the level of the “infraconscious”—associations that have more intensity and more prominence. This level of awareness is dominated by probabilistic relationships which may be the source of major innovations and pass into the cognition threshold as flashes of insight.

3. *The threshold of cognition.* Is the relationship strong enough to be consciously embodied as a symbol? The ability to so conceptualize and communicate our expertise constitutes a higher level of information processing and hence a more stringent probability level. Associations here are more intense, distinct, and augmented by symbols. Simonton labels this the “conscious” level. He states that once the infraconscious becomes conscious, gradual growth is replaced by logical, syntactic rules. Simonton contends that although the conscious processes are more conservative and more prone to be swayed, they can be shared and can generate novel hypotheses through the permutation of ideas. He feels that processings at this level tends to extend implications of what we know and that at times a cul-de-sac is reached where the initial set of givens is exhausted.

4. *The threshold of habituation.* Is the conditional probability so high that we act without more deliberation? This, according to Simonton, is the “ultraconscious” state we reach when we are in a blind rage.

By breaking down the unconscious or non-conscious into several levels and indicating how these levels might interact with what we call conscious thought, Simonton demystifies the unknown. He also provides a basis for differentiating between types of thought or experience that fall outside the boundaries of explicit conscious thought. Simonton believes that human information processing can be empirically differentiated into two levels—intuition and analysis—and that verbal processes are qualitatively different in the two information-processing levels. Verbal associations below the cognitive threshold are based on the physical, emotional, and cognitive relationships among words, whereas

verbal associations above the cognition threshold are based on denotative and syntactical relationships among words. Thus, the threshold of cognition becomes the bridge between apprehension and comprehension. Language imposes logic; patterns of both structure ideas. The ability to “attend,” according to Simonton, seems to mark the threshold of behavior and intuitive processing. The ability to articulate denotes passage into cognition and analytical processing.

Simonton sees a number of distinct differences between these types of information processing. He claims that intuitive processing involves a slow gradual curve, sidesteps the need of cognitive mediation by gradually accumulating the relevant conditional relationships, and is more effective than analysis for learning concepts (solving problems) that are ambiguous, complex, or novel. He claims:

As the stimuli becomes less easy, two things happen. First, it becomes increasingly difficult to retrieve germane information from the store of knowledge having passed the threshold of cognition—as stimuli increase in ambiguity, complexity, or novelty, it becomes even more difficult to affix verbal symbols to them. Much of the pertinent information will more likely reside in the infraconscious. Second, and even more critically, the cognition threshold, after all, presumably filters out all but the most clear, simple, and consistent meanings of our symbols. Since cognitive mediation becomes increasingly restricted as the stimuli become more ambiguous, complex, or novel, intuition should become even more viable as an information-processing alternative (p. 32).

Simonton states that analysis is more effective in learning intradimensional shifts and acquiring deterministic relationships and abstract concepts; intuition, on the other hand, is more effective in learning extradimensional shifts and acquiring probabilistic relationships. He also sees a relationship between arousal level and the types of processing and claims that analysis is more effective at moderate arousal levels and intuition at low arousal levels, an issue which may have some bearing on strategies or tactics people use to access intuition.

Strategies to access intuition

As with the entire body of literature on intuition, two major themes appear in investigating the use of methods to access intuition. First, information on the topic is sparse and is primarily descriptive and/or anecdotal. Second, there seems to be a growing sense that people can decide and/or use particular strategies or tactics. Thus, the literature is moving from a concept of intuition as a passive activity over which people had no influence towards a process over which people can have some influence.

As with the term *intuition*, the term *strategy* is used in a variety of ways throughout the literature. This study incorporates Gerber's (1983) definition of *strategy* as a "skillful, deliberate, and coordinated use of problem-solving tactics" (p.256). *Tactics* are skills, clusters of related skills, or expedition procedures. In general, the literature does not yield such precise definitions. Yet information on what might be classified as methods, techniques, strategies, procedures, or habits may provide a useful context for interpreting this report.

Activities to encourage or enhance the use of intuition

Vaughan (1979), Goldberg (1983), and Harman and Rheingold (1984) all suggest ways in which individuals can increase or enhance their use of intuition. Vaughan's (1979) classic *Awakening Intuition* has served as one basis for others' perspective (Goldberg, 1983; Agor, 1986). She suggests three basic steps in training the mind for optimal development of creativity: quieting the mind (relaxation); focusing attention (concentration); and cultivation of a non-judgmental attitude (receptivity). Providing a number of exercises to achieve these states, she describes imagery and dreams as bases of gathering intuitive data, and provides the 17 guidelines in Table 5 for individuals wishing to enhance their skills that Agor (1986) later boiled down to 8: intent, time, relax, silence, receptive, honest, trust, and courage.

Goldberg's (1983) extensive list of techniques to encourage intuition can be grouped into four categories:

1. Specific mental/creative activities; for example, writing down goals and objectives, using analogies, clustering ideas, brainstorming.
2. Physical procedures such as yoga, breathing exercises, muscle relaxation.
3. Procedures to enhance incubation, including sleep, imagining, and meditation.

Table 5

Guidelines for Awakening Intuition

- | | |
|----------------|---|
| 1. Intention | The first requirement for consciously awakening intuition is a clear intention to do so. Intuition is already within you, but to awaken it, you have to value it and <i>intend</i> to develop it. |
| 2. Time | Your willingness to devote time to tuning in to your intuition, making a space for its unfolding in your life, is part of valuing and developing it. |
| 3. Relaxation | Letting go of physical and emotional tension gives intuition the space to enter your conscious awareness. |
| 4. Silence | Intuition flourishes in silence. Learning to quiet the mind is therefore part of the training for awakening intuition. Various meditative practices are useful in learning to maintain the necessary inner silence. |
| 5. Honesty | Willingness to face self-deception and to be honest with yourself and others is essential. Creating any kind of smokescreen interferes with clear vision. Giving up pretenses is a big step in awakening intuition. |
| 6. Receptivity | Learning to be quiet and receptive allows intuition to unfold. Too much activity or conscious programming gets in the way of intuitive awareness that emerges when a receptive attitude is cultivated. |

(table continues)

Table 5

Guidelines for Awakening Intuition (continued)

- | | |
|-------------------|--|
| 7. Sensitivity | Finely-tuned sensitivity to both inner and outer processes provides more information and expands intuitive knowing. Sensitivity to energy awareness and the quality of experience is particularly useful. |
| 8. Nonverbal Play | Drawing, music, movement, clay, and other forms of nonverbal expression done in a spirit of play, rather than for the purpose of goal-oriented achievement, provide excellent channels for activating intuitive, right-hemisphere functions. |
| 9. Trust | Trusting the process, trusting yourself, trusting your experience, are the keys to trusting and developing your intuition. |
| 10. Courage | Fear gets in the way of direct experience and often generates deception. Your willingness to experience and confront your fears will facilitate the expansion of intuition. |
| 11. Acceptance | A nonjudgmental attitude, an acceptance of things as they are, including self-acceptance, allows intuition to function freely. |
| 12. Love | Opening your heart to feelings of nonjudgmental love and compassion allows you to see into the nature of things. Emotional empathy and intuitive identification are facilitated by love and compassion. |

(table continues)

Table 5

Guidelines for Awakening Intuition (continued)

- | | |
|---------------------|--|
| 13. Nonattachment | The willingness to let things be as they are, rather than trying to make them be the way you would like them to be, or the way you think they should be, allows intuition to emerge. You can see things as they are only when desires and fears are out of the way. |
| 14. Daily Practice | Intuitive awareness grows with daily attention. If you discount or neglect it most of the time and only want it to perform occasionally, it may not respond. |
| 15. Journal Keeping | Keeping a record of intuitive flashes, hunches, insights, and images that come to mind spontaneously at any time of the day or night, can help stabilize and validate them. |
| 16. Support Group | Finding one, two, or more friends with whom you can share your interest in the development of intuition, as well as your successes, failures, hopes, and fears, can facilitate and accelerate the process of development. Sharing experience with someone who is willing to listen without judging or interpreting is very useful. |
| 17. Enjoyment | Following intuition does not always feel good. At times it may seem difficult and entail arduous work. At other times it may be effortless. Enjoying the creative resources of intuition is based on the intrinsic satisfaction of expanding consciousness, taking responsibility for your life, and surrendering to your own true nature. |

Source: Vaughan, Frances E. (1979), *Awakening Intuition*, Garden City, New York, Anchor Press/Doubleday

4. Visualization procedures that follow meditation such as making a mental journey, mental rehearsal, or asking yourself a question.

Like Frances Vaughan (1979), Goldberg considers the regular practice of meditation as the single most powerful means of increasing intuition. On the other hand, Harman and Rheingold (1984) see the development of psychological freedom as the key to our ability to increase the use of intuitive capacities.

Moskol (1980), Silverman (1985), Issack (1980), Agor (1986), Rockenstein (1988), and Markley (1988) address ways to encourage or enhance the use of intuition in problem solving and business. Moskol (1980) points out that among the first few applied approaches to problem solving in industrial and business settings were *brainstorming*, developed by Osborn, and *synectics*, the contribution of Gordon (Moskol, 1980). Brainstorming is a group technique that encourages people to generate a large number of alternatives in a free wheeling, relaxed atmosphere. Synectics calls for problem solvers to view a problem in three heuristic ways—as if it were something in nature; as if it were personal; and as if it were fantasy. Silverman refers to two principles of synectics—making the strange familiar and making the familiar strange—as strategies to encourage the use of intuition in ill-structured problem solving.

Building on the work of Osborn and Gordon, Issack (1980) suggests stimulating intuition by analogy generation, forcing a reversal of the conventional, random word stimulation, exposure to the irrelevant, opposites and contradiction or antitheses.

More recently Rockenstein (1988) and Markley (1988) suggest approaches for developing intuition as it relates to creative thinking and problem solving. Rockenstein's taxonomy has four levels:

1. Awareness—becoming aware of intuition through study, reflecting, and imaging.
2. Comprehension—integrating intuition as an integral part of creative thinking.
3. Development—using relaxation focusing, imaging, and dream exploration to develop the non-verbal reticulum of the mind.
4. Individualism—continuing development of individual's intuitive potential.

Among the four methods Markley (1988) suggests for using depth intuition in creative problem solving, psychotherapy, and future research are focusing techniques, and a procedure for experiencing and assessing alternative futures.

Towards a more active role for the problem solver

The traditional perspective on intuition as an unknown, perhaps unconscious process of problem solving, while still strong in the literature, is being questioned by some recent writers. This may reflect a move from looking at intuition through the lens of creative problem solving in the Gestalt tradition towards an information-processing approach. It may also be linked to the development of the concept of meta-cognition and/or

an increasing awareness that as human beings we may have abilities that were previously not apparent to us.

Herrmann (1982), Goldberg (1983), and Rockenstein (1988) are among the many who see intuition as a process that occurs during a particular stage in the problem-solving process. Their work, and much of the literature that has evolved around the concept of creative problem solving, is based on a four-stage model originally developed by Graham Wallas in 1926 (Davis, 1973). The stages are:

1. Preparation—collecting and organizing data.
2. Incubation—relaxing over a period of time.
3. Illumination—experiencing a sudden inspiration.
4. Verification—testing and evaluation.

In this model, incubation has been associated with intuition because incubation is said to operate in the sub-conscious mind. While the Wallas concept has endured more than 60 years and many currently ascribe to it, some differ. For example, Catford (1987) investigated problem-solving strategies placing them in groups based on the dimensions of the Myers-Briggs Type Indicator (i.e., sensing intuition, feeling, thinking). Among her intuiting strategies were visualizing success and letting go of expectations which could be viewed as preparation or data gathering exercises in the context of Wallas' model.

Additionally, both Goldberg (1983) and Isenberg (1984) list evaluation as a function of intuition. Within Wallas' model evaluation might be viewed as a verification task.

The second phase of the model, incubation, is generally viewed as time spent away from working on the problem, in relocation, in sleep or in some other activity. Goldberg (1983) raises questions about this perspective on incubation:

Whatever takes place during those long stretches of time might also occur instantaneously during microscopic diversions of attention. In a meeting, for example, while someone else is speaking, you might miss a word or two. While working intensely on a task, your mind might wander every so slightly. Such lapses, which we usually deplore, might actually represent momentary incubations, enough of an interlude to set up the right conditions for incubation (p. 67).

Catford (1987) and others have also raised the question of what goes on in the "black box" called incubation. Catford found that during what might be viewed as the incubation phase, people engaged in a variety of actions such as redefining a problem, generating ideas, and multiple solutions. Thus, the incubation phase may not be as static as it may seem. Simonton (1980) and Bastick (1982) also provided ground work for the idea that incubation is a process where continual thinking occurs.

Agor (1986) claims that the intuitive process can be a conscious one; while Harman and Rheingold (1984) claim that individuals can direct intuition more explicitly. Issack (1980) contends that even if people lack understanding of internal processes, they can influence outputs. Issack compares intuition to electricity. He notes that electricians do not

need to know what is in the black box but can concentrate on the input and output . “We can use implicit methods to prime the intuition without knowing how it functions” (Issack 1980, p. 75).

My study

Although my study is not a direct outgrowth of any other single work, it has grown from and can be linked to the body of research literature that discusses intuition and specifically intuition and problem solving. This study is based on one of Westcott’s (1968) premises that an empirical body of research on intuition is needed. It considers both the broad literature reviews of Bastick (1982) and Simonton (1980) and their view of intuition as a process. The perspective taken on problems and problem solving is drawn from the information-processing tradition. Thus the study focuses on the relation between the problem task, problem environment, and the problem solver. From information-processing theory also comes the concept of ill-structured problems, a way to define the type of problems most likely to require intuitive processing. Finally, a review of methods to develop or enhance intuition provides a backdrop to examine the specific activities people use to access intuition.

Despite a comprehensive search of the literature on intuition, I found no specific studies addressing the study question, “What are the strategies and tactics people use to access their intuition in solving complex, ill-structured problems?” The closest study, Catford (1987), investigated problem-solving strategies using interviews and journals as the means of data gathering. My study differs significantly from Catford’s. Catford looked at problem-solving strategies and segmented them into one of four groups:

intuition, sensing, feeling, thinking. This study looks at actions used to access intuition. It describes specific actions taken and discusses them as strategies and tactics.

This study contributes to the small body of empirical research related to intuition and problem solving. By focusing on the strategies and tactics used to access intuition, it addresses a topic for which verbal reports are an appropriate form of data gathering (Ericsson and Simon, 1984). Moreover, it studies intuition in the context of the type of everyday situations that Westcott (1968) suggested be investigated. Such ill-structured problems, may better highlight strategies and tactics used to access intuition than laboratory situations. The result is one small piece of research that links with a developing body of study.

Conclusion

This literature review has provided an overview of the literature on intuition in general and has focused on specific intuition and problem-solving intuition as a problem-solving process and on strategies to develop or enhance intuition. In each of these areas, I found that despite the growing number of works on intuition, the research is still sparse and for the most part based on opinion and anecdotal evidence. The concept of intuition remains largely ill-defined as does intuition's role in problem solving.

The works of Westcott (1968) and Fischbein (1987) stand out as comprehensive and well-researched literature reviews. Moreover, Westcott provides a foundation for a philosophical and psychological perspective at the same time as the results of a thorough empirical investigation. Fischbein's contribution (1987) includes a detailed classification

that can reasonably incorporate much of what has yet been written on the topic. Additionally, Bastick (1982) and Simonton (1980) address the issue of how intuition works, and Vaughan (1979), Goldberg (1983) and Agor (1986) contribute to understanding how people develop or enhance intuition.

As a human behavior, intuition works within a context of understanding, learning, knowing, or problem solving (Fischbein, 1987). Since this study focuses on its use in problem solving, literature related to problem solving, particularly the information-processing tradition, was reviewed (Newell and Simon, 1972). A key contribution from that literature was the concept of ill-structured problems as likely settings for the exercise of intuition (Silverman, 1985; Churchman, 1971; Newell and Simon, 1972).

While no studies which specifically addressed the topic of the dissertation were found, the literature provides a groundwork in key areas framing this study. The dominant themes crossing all areas are a paucity of data and a predominance of anecdotal or opinion pieces, coupled with a shift towards the perspective that people may be able to influence or direct their intuition in ways previously unrecognized.

These two factors led me to choose qualitative case study research for my investigation. This study adds to the empirical knowledge available on intuition and addresses people's perspectives on how they direct or influence their intuition. The next chapter details the study's method.

CHAPTER 3: METHOD

Introduction

The purpose of this study is to address the question: “What strategies and tactics do people use to access their intuition when they solve complex, ill-structured, problems?” Ill-structured problems are not easily solvable by immediate application of well-known procedures or decision roles (Silverman, 1985). Thus, they provide a fertile ground for researching intuition. Westcott (1968) defined intuition as “reaching conclusions on the basis of little information which are ordinarily reached on the basis of significantly more information”. Fischbein (1987) affirmed that intuitions refer to “self-evident statements that exceed the observable facts.” The study arises from a deep concern about how human resource development professionals can help individuals develop and/or release their intuition. It is driven from a belief that the work force of the future will require more people in more jobs to be skilled in accessing their intuition.

The focal point is the moment of solution. The study examines specific actions individuals take before and at the time solution to complex, ill-structured problems becomes apparent. It looks at conscious strategies and tactics. Strategies are the “skillful, deliberate and coordinated use of problem-solving tactics”; tactics are “skills, clusters of related skills, or heuristic procedures which may be conscious or non-conscious” (Gerber, 1983). It also considers tacit mental actions—actions that occur by steps we cannot articulate. In journals and interviews study participants identified problems they solved in which intuitions occurred, and provided information on the specific actions they took during or at the moment of solution. The analysis describes each instance participants reported. It also

examines commonalities that appear in the processes used. Thus, the approach taken here is appropriately a qualitative one (Miles & Huberman, 1984; Merriam, 1988).

Population and sample

The 11 participants were human resource development personnel. Table 8 contains details about them: their organizations, roles, and experience. Participants' work experience ranges from 7 to over 20 years in the human resource development field; 6 of the 11 have more than 15 years work experience. They are also well educated: 5 have a doctorate in HRD, 2 are doctoral candidates in HRD, and another has a doctorate in a different field. Additionally, 2 others have Master degrees in human resource development. Of the 11 participants, 3 work in the public sector and 8 in the private. They hold responsible positions. Their roles range from training specialists, who focus on single projects, to mid-level and senior managers in charge of program areas or groups, to senior personnel with policy and oversight responsibilities and another, a corporate vice president who reports directly to the CEO.

Criteria for participation

The sample was drawn from a population of human resource development managers because members of this group were considered likely to provide the appropriate type, amount, and depth of data needed to address the research questions, and were potentially willing to participate, since the research results would be useful to their jobs.

Table 6
Participant Characteristics

CATEGORIES	"Bill"	"Dana"	"Don"	"Glenn"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Role	Corporate Vice President Executive and Management Development	Magazine Editor	Personnel Manager	Director, Training and Development	Program Manager	Management Training and Team Building responsibilities	Training and Development Specialist	Senior Training Manager	Training Manager	Human Resources Development Division Director	Training Manager
Experience and Education	Electrical Engineer (Dr.) General Manager	20 years experience in writing; 7 years in HRD	8 years experience in personnel	Many years experience in HRD field; Masters Degree in HRD	22 years in the field; Doctorate in HRD	17 years experience HRD; Doctoral candidate	10 years experience; Masters degree in HRD	More than 20 years experience in the field	Consultant for 15 years, in training for 7 of those years	Approximately 20 years experience; Doctorate in HRD	Doctoral Candidate, HRD
Company Type	Private; Contract Research	Private; Membership Association	Private; designs and builds communication systems for military	Private; financial services	Private/multinational; provides information, real estate and financial services	Private; high tech market driver data communications company	Private; data communications company	Public; policy/overnight group for major government agency	Private; consulting firm that specializes in dispute resolution, litigation, arbitration, and financial analysis	Public; Government Agency; Division develops training programs	Public Government Agency;
Company Size	4,000 people \$300 million in sales	20,000 members	Several hundred employees	1,700 people \$6 billion in assets	Multinational; very large	Worldwide organization	Worldwide	Major government agency	National/international consulting firm	5,000+ people	5,000-8,000 people
Other	Reports to COO		Responsible for employment, EEO benefits, and compensation	3-7 direct reports	Co-leads key division	Responsible for specific projects	Responsible for specific projects	Responsible for policy and oversight functions	Responsible for design/presentation of firm; programs on consulting and mgmt. skills	Leader of group	3-7 direct reports

Human resource development professionals' jobs require them to solve complex, ill-structured problems. Designing education courses is in itself an ill-structured activity. Additionally, human resource development professionals deal daily with complex personnel, resource, and organizational issues which are often the contents of ill-structured problems. Because of their job responsibilities and settings, human resource development professionals are more likely than others to be attuned to the question of what strategies and tactics we use to access intuition in problem solving.

I deliberately sought out human resources professionals with an interest in intuition's role in problem solving who may have taught courses in problem solving or were grappling with organization structures to foster productive problem solving. Because of their profession, I believed them to be in a better position to articulate the strategies they used than people who may not have considered such issues as intuition or problem solving.

Selection procedures

Participants were chosen based on the criteria described above and came from two sources: my own contacts and people recommended by a group of human resource development colleagues in the Washington metropolitan area. This group of colleagues includes practitioners active in area professional activities and professors at local universities. After potential participants were identified, I met with each to explain the project and its requirements. During these interviews, I determined: (1) whether the potential participant encountered ill-structured problems; (2) whether the participant could articulate the strategies or tactics he or she used to access intuition; and, (3) whether the participant expressed the needed level of commitment for the study. Potential participants

received specific descriptions of planned activities and timetables so that they knew what would be expected of them and when, and were asked to determine whether or not they wanted to go ahead (see Participant Instruction Booklet, *Appendix A*). Of the 12 potential participants I contacted, 11 agreed to the initial interview and all of these participated in the study.

Participant involvement

An important aspect of this study is its emphasis on involving the participants. The 11 people involved are not really subjects, but were considered co-researchers or participants. They played a significant role not only in providing data but also in ascertaining that the data were accurate and reflected their meaning. Merriam (1988) suggests that such participant involvement provides internal validity to a qualitative study. Participants were contacted many times throughout the study and had opportunities to verify and comment on both a transcript of the taped interview and their journals, as well as a summary narrative of the data they provided. Two also participated in a walk-through of the study's results. Therefore, the term "participants" is used instead of "subjects" throughout this study.

Participants' anonymity

Participants were assured of anonymity and were encouraged to speak freely about topics that in many cases were both confidential and sensitive. To respect their privacy and ensure that anonymity, I have not used any direct quotations or made statements that I believe would provide any specific information through which participants could be

identified. Additionally, after checking with each person, I used a pseudonym which provided me a way to discuss the cases within the appropriate contexts and without identifying the participants. The chosen names were selected at random.

Data collection procedures and material

Each participant was asked to record data on an instance using intuition to solve a problem within three weeks of the initial interview. Participants were asked to complete journals or logs describing a situation where they used strategies or tactics to access intuition to solve a complex, ill-structured problem. The journals included a list of specific questions that served as prompts or guidelines. These focused on the moment the problem solution became apparent and the actions participants took to access the intuition. After participants completed the journals, they participated in an in-depth interview. Examples of instruments and participant materials used are provided in the Appendices. They include a Participant Instruction Booklet with key definitions and journal questions (*Appendix A*), the Interview Questions (*Appendix B*), and a Consent Form (*Appendix C*).

Participant journals

Participant journals were a primary data source. A number of other researchers have used journals to look at creative problem solving (Catford, 1987; Patrick, 1937; and John-Steiner, 1985). Catford's study specifically looked at strategies people used for creative problem solving. In these instances, journals were kept on a spontaneous or on an on-going basis as someone worked through a problem.

My approach was different. Participants were asked to identify instances where they accessed their intuition in solving a problem. For these instances, they provided details about the problem solved, the intuition that occurred, and the actions they took at the moment the problem solution occurred. An instance was defined as an occasion where the overall solution to a complex problem or to a subproblem became apparent to the solver. Participants were asked to review a list of specific questions as they wrote their journals. These questions were guidelines for participants as noted in *Appendix A*, the Participant Instruction Booklet. Where multiple responses were appropriate, participants were urged to indicate them and to explain their responses. Table 7 lists the journal questions.

While all participants used the journals, some differences in their use developed. Most briefly addressed descriptions of the problem, the intuition, and their actions, and also provided information related to each question listed. However, Don and Dana wrote very complete (1-3 pages) descriptions of the problem and the intuition, and Sharon addressed only the probes.

Structured interviews

Structured or focused interviews provided an opportunity to probe more deeply into participants' descriptions of the actions they took to access their intuition and to gain information about instances that happened before the study. They provided information on the context in which actions were taken. They were also helpful in understanding the perspectives participants' held about intuition, problem solving, and their own thought processes. As the discussion of findings in Chapter 5 illustrates, conducting the interviews made the study much more useful than basing results on the journals alone. The interviews

Table 7
Participant Journal Questions

The problem	The intuition	Your actions
<p>1. Describe the problem or sub-problem you solved. What was the nature of the subject matter: program design, financial management, resource allocation, long- or short-range planning, a policy question; other? Explain.</p>	<p>1. Describe the specific intuition that occurred aiding your solution to the problem. Was the intuition primarily: auditory (you <u>heard</u> something); visual (you <u>saw</u> something); kinesthetic (you <u>felt</u> something); symbolic; just a faint idea; an inner dialog; other? Explain.</p>	<p>1. Describe the specific actions you were engaged in at the moment or just before the overall problem solution occurred. What were you doing when and immediately before the intuition occurred?</p>
<p>2. Please provide your view on the nature of the problem. Address all three issues. Was the problem simple or complex? Were there multiple answers? Was there one “right” approach? Explain.</p>	<p>2. What was your initial reaction to the intuition: skepticism; rejection; reserved judgment; hesitation; relief; joy; certitude; other? Explain.</p>	<p>2. Were you actively engaged in solving the problem?</p>
<p>3. For you, your organization, or both, was the situation or subject matter: extremely important; very important; moderately important; not very important; trivial? Explain.</p>	<p>3. Was it: a quick flash; a prolonged experience; very clear; vivid; somewhat clear; hazy? Explain.</p>	<p>3. Did you intentionally take some action to access your intuition? What did you do?</p> <p>4. Did you have some signal or clue that an intuition might occur? What was it?</p>

(table continues)

Table 7 (continued)

The problem	The intuition	Your actions
4. Were you under pressure to make a decision or come up with an answer?	4. Did the intuition return to you at various times? When? How often? Did you expand on it? Explain.	
	5. Did you analyze it? Did you gather information to support and/or refute it? Explain.	
	6. For you, your organization, both, or others, did the problem solution represent: a great risk; a moderately high risk; some risk; not much risk. Explain.	

allowed me to ask a number of valuable questions and to probe deeply into participants' responses and, in fact, changed the scope of the findings.

Interviews were taped and transcribed for data analysis. They lasted approximately forty-five to sixty minutes and consisted of the *Appendix B* questions in Table 8.

Participant instruction and materials

The initial meetings provided participants with background about the purpose of the study as well as key definitions. The *Appendices* include copies of materials that participants received. *Appendix A*, The Participant Instruction Booklet, includes a description of the project, definitions, and a copy of the record of events that served as a basis for the journals. *Appendix B* lists interview questions. *Appendix C* is the consent form.

Problems selected for the study

A key factor in this study is that participants were asked to report on complex problems. The goal was to address employing intuition to solve complex, ill-structured problems. Such problems have no single solution, are ill-defined, and are not easily solved by immediate application of well-known procedures or rules (Silverman, 1985, Sinnott, J. D., in press).

Table 8

Participant Interview Questions

1. Tell me more about the problems you wrote about in your journal. How did the situations work out? Was the intuition verified by experience or was it refuted? In retrospect, would you do anything differently?
2. Are the situations described here typical of your experiences using intuition in problem solving? Are there additional strategies you use or different types of experiences you think it's important to describe?
3. Do you always heed your intuition? Do you ever turn it down? When? Why?
4. Are there circumstances when you acted on intuition and were wrong? What were the conditions/characteristics of those situations?

Note: Participants were also probed for fuller answers (when appropriate) by such questions as, "Can you give me an example?", or "Did you do anything specific to help yourself come up with a solution?"

The study took this direction for several reasons. First, intuitions have been defined as mental constructions which help us extrapolate from data that are immediately accessible to information which exceeds our grasp (Westcott, 1968; Bruner, 1973). Complex, ill-structured problems present situations which require such extrapolation. Second, such problems have been found to be solved through accessing intuition (Agor, 1986; Silverman, 1985). Third, I believed that participants would be able to provide richer data on experiencing intuitions if they described their own actions to complex, ill-structured problems they faced.

The problems chosen by study participants can be classified as ill-structured. They involved persuading people, program planning, creating a scoring scheme for a game, and ad design. Chapter 5 includes both a detailed discussion of the problems and Table 9, which highlights several problem characteristics.

Chronology of data-gathering procedures

Participant interviews

As part of the selection procedure and as a way of gathering background data on the type of problems participants encounter, an individual meeting was held with each participant at a mutually convenient place. These interviews helped provide the “thick descriptions” that contribute to the reliability of qualitative case studies (Government Accounting Office, 1987). During these sessions, the participant ; and I discussed the confidentiality of the study as well as the procedures, definitions, time lines, etc. Participants received their journals and discussed potential problems that might serve as a

basis for their report. Thus, participants were prepared to select an appropriate problem for the study when such a problem occurred.

Follow-up

Letters were sent thanking participants for their involvement after their initial agreement and after their focused interview. Additionally, I called each at least once between the first and second interview. The focus of the discussion was their progress towards identifying a problem and/or subproblem to use as the basis of the journal. Participants were encouraged to call me if they had any questions during the study.

Journals and interviews

Focused interviews were held after participants completed their journals. The interviews allowed participants to expand on their journals and to discuss other problem-solving situations where they used strategies to access intuition. The interviews were 45 to 60 minutes long and were audiotaped and transcribed. The transcriptions were sent to the participants to verify accuracy and provide clarification, if needed. During these interviews, I again emphasized the participants' anonymity.

Participants' reflections

After the data from each individual participant were gathered, I wrote a narrative summary of the case and sent it to the individual to review. Co-researchers then determined whether the summary was accurate and credible and received an opportunity to

make additional comments to add meaning or to clarify. Participants' actions helped ensure the reliability of the data.

Walk through of process

Additionally, two participants agreed to walk through the process of analysis with me to help verify the analysis. This provided another reliability check. Both participants are themselves researchers. One recently completed her doctorate in HRD. The other has embarked on her dissertation. Each read their own journal and interview transcript. They then read each other's transcripts. Then they compared elements I had discerned in the data with the transcripts. These participants corroborated my data classification. Their conclusion was that the approach taken was reasonable. They stated that they might have classified the data similarly, albeit, they might have used different words. In addition, they reviewed the groupings I had established and the conclusions I had reached about the interrelationship between problems chosen and actions taken. They again indicated that they agreed with the logic of the findings.

Data analysis

A continuous process.

Merriam (1988), who calls data analysis "the process of making sense out of one's data" (p.27), points out that with the case study method, data analysis is intertwined with data collection. That is the situation in this study. Throughout the data collection and analyses process, I used a variety of strategies to make sense out of the data. These

included developing analytic questions, writing, observation, reflective memos, and keeping a diary.

Data analysis procedure.

Merriam (1988) explains that in qualitative case study research, several levels of data analysis and synthesis are possible. The first level is descriptive. The second involves construction of categories, types, and themes and is interpretive to some extent. The third level involves making inferences and developing theory. This study focuses on the first two levels: description and category construction. The findings in Chapter 4 are descriptive; those in Chapter 5 involve category construction and theme identification.

The dynamics of the discussion of the accessing of intuition in Part 3 of Chapter 5 reaches the third level of analysis. This level represents a synthesis, or perhaps the beginnings of substantive theory. Goetze and LeCompte (1984) define substantive theory as “interrelated propositions or concepts lodged in particular aspects of populations, settings, and times that can be identified concretely.” They see this as the first of three levels of theory which involve increasingly abstraction and generalization. The other two levels are formal or middle-range theory and grand theory.

Data analysis procedures involved typing the journals, audiotaping and transcribing the interviews, creating structured charts as well as using HyperCard, a computer application, as an analysis tool. HyperCard is a software program that runs on the Macintosh computer. HyperCard is a data base application that organizes individual pieces

of data into stacks which can be linked together. The HyperCard application designed for this study proved a very valuable sorting tool.

To obtain the ability to appropriately describe each case, I read each participant interview and journal several times. My intent was to understand the key points participants were making about their experience and actions and to understand both the sequence of events and the relationships between them. I then wrote narrative summaries and sent them to each participant to ensure that the events were accurate and that key issues had been captured.

Next, I wrote vignettes incorporating quotations from the journals and the interviews. The vignettes also include information on additional instances described by participants as well as other issues they discussed in the interview. In some cases, the vignettes record participants' perspectives on their own problem-solving processes.

Then I performed a comparative analysis on the data from participants' journals. I examined each statement in the journals, as well as the overall descriptions of the participants' problem, intuition, and actions, and placed each comment in an element category using the HyperCard program. Eighteen distinct elements were established based on participants' statements. The elements were then grouped into three sections depending on whether they dealt with the problem, the intuition, or participants' actions (presented in Chapter 5). They were described as problem elements, intuition elements, or actions. This information served as the basis for the "Analysis of the Journals," in Part 1 of Chapter 5.

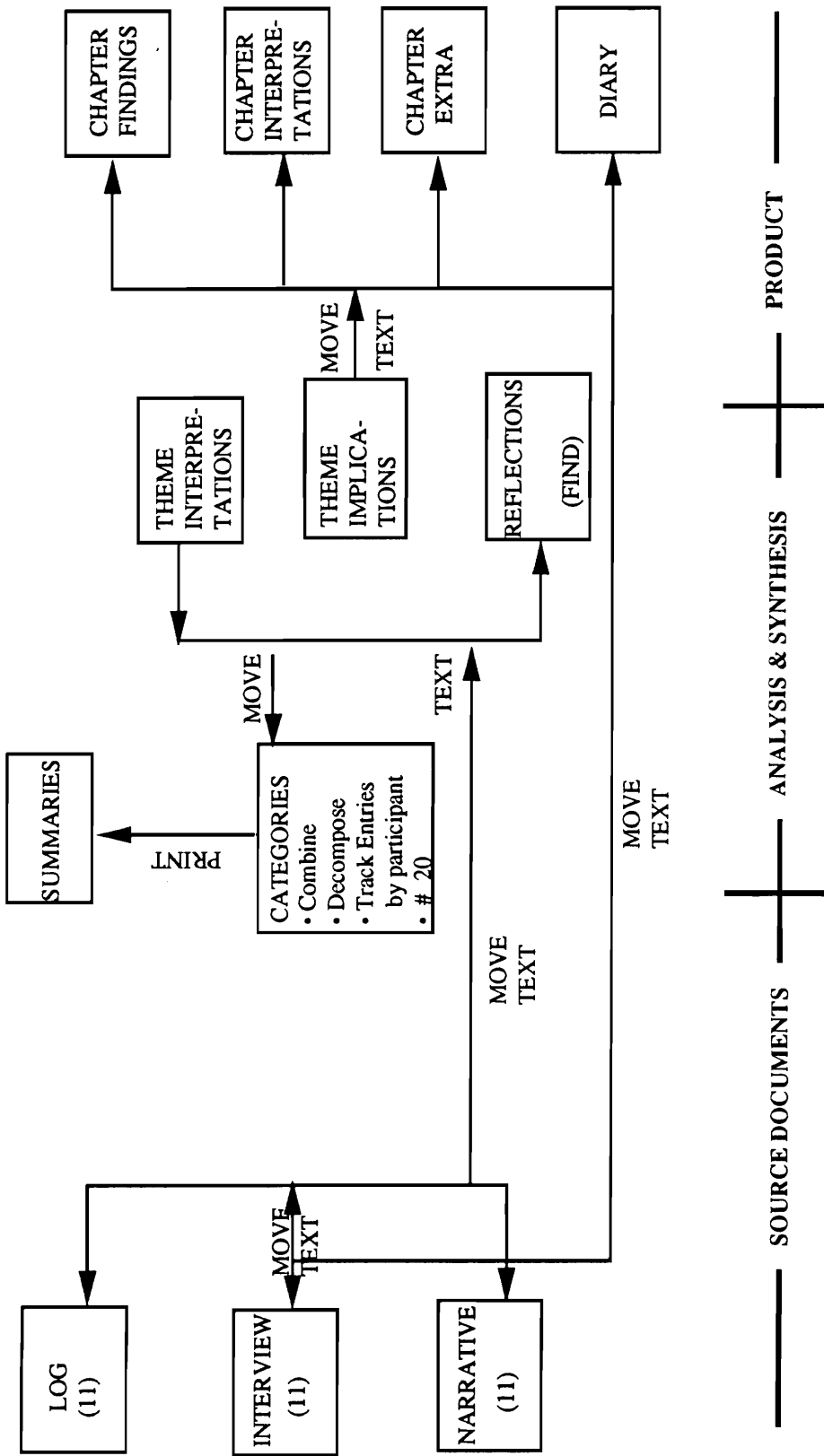


Figure 5

HYPERCARD RESEARCH APPLICATION

The third stage of analysis involved an in-depth examination of all journals and interviews to identify all major elements in participants' comments. The process was a laborious step-by-step approach. Each journal and interview was read, and the comments were identified as elements. The length of the comments was determined by the researcher's judgment on where a meaningful statement began and where it ended. The process involved a constant comparison between newly examined data and previously identified elements (Glaser and Strauss, 1967). I began to group elements together. If a statement appeared to fit within an existing element, I listed it under the same heading. Otherwise, a new title was initiated. Some overlap occurred and data were placed under more than one title. This happened, for example, where a statement not only described a participant's action, but also shed meaning on his or her perspective of the process as well.

The initial review of all data yielded (70) elements. Figure 6 displays these elements. These elements were stored in separate HyperCard stacks. They are roughly grouped, depending on whether they deal with participants' problems, intuitions, actions, or perspectives. These groups were based on the journal design and an initial review of the data interviews. I first entered all elements in the journals into three HyperCard stacks (problems, intuitions, and actions). Then I added elements from the interviews to these three and began a fourth stack (perspectives). Elements were stored in this manner because with HyperCard grouping and regrouping of data can be done most easily within, rather than between, stacks.

The HyperCard application allowed a complete printout of the data by participant and by element. The initial classification data were printed out in both of these fashions. The data were reviewed on a participant-by-participant basis and on an element-by-element

basis to check for possible omissions and duplications. Then the process of restructuring the categories began. I used such strategies as noting patterns and themes, seeing plausibility, and clustering (Miles and Huberman, 1984). The end result of this process was the establishment of five categories, discussed in detail in Chapter 5. They include Problem Elements, Intuition Elements, Actions around the Moment of Solution, Actions to Access Intuition, and Participants' Perspectives.

The fourth stage of analysis, a synthesis of the dynamics of accessing intuition, is presented in Part 3 of Chapter 5. This synthesis is more abstract and inferential than the descriptions in Chapter 4 or the analysis of journals and interviews in Parts 1 and 2 of Chapter 5. It represents a synthesis across individual cases and categories constructed. To develop it, I sought and attended to the commonalities among participants' experiences. I examined such questions as "How were the problems similar?" "What did the intuitions have in common?" and "What actions prevailed at the moment of solution?"

An important base of this synthesis was participants' comments about their background knowledge and concern to solve the problem. These perspectives provided data about participants' values and on events distant from the moment of solution. Both seemed to have some relationship to the actions taken at that discernable moment in time.

Issues of reliability and validity.

Merriam (1988) and others (Miles and Huberman, 1984; and Goetze and LeCompte, 1984) suggest ways to ensure internal validity and reliability that were incorporated into this study. For example, to help ensure that the findings are internally

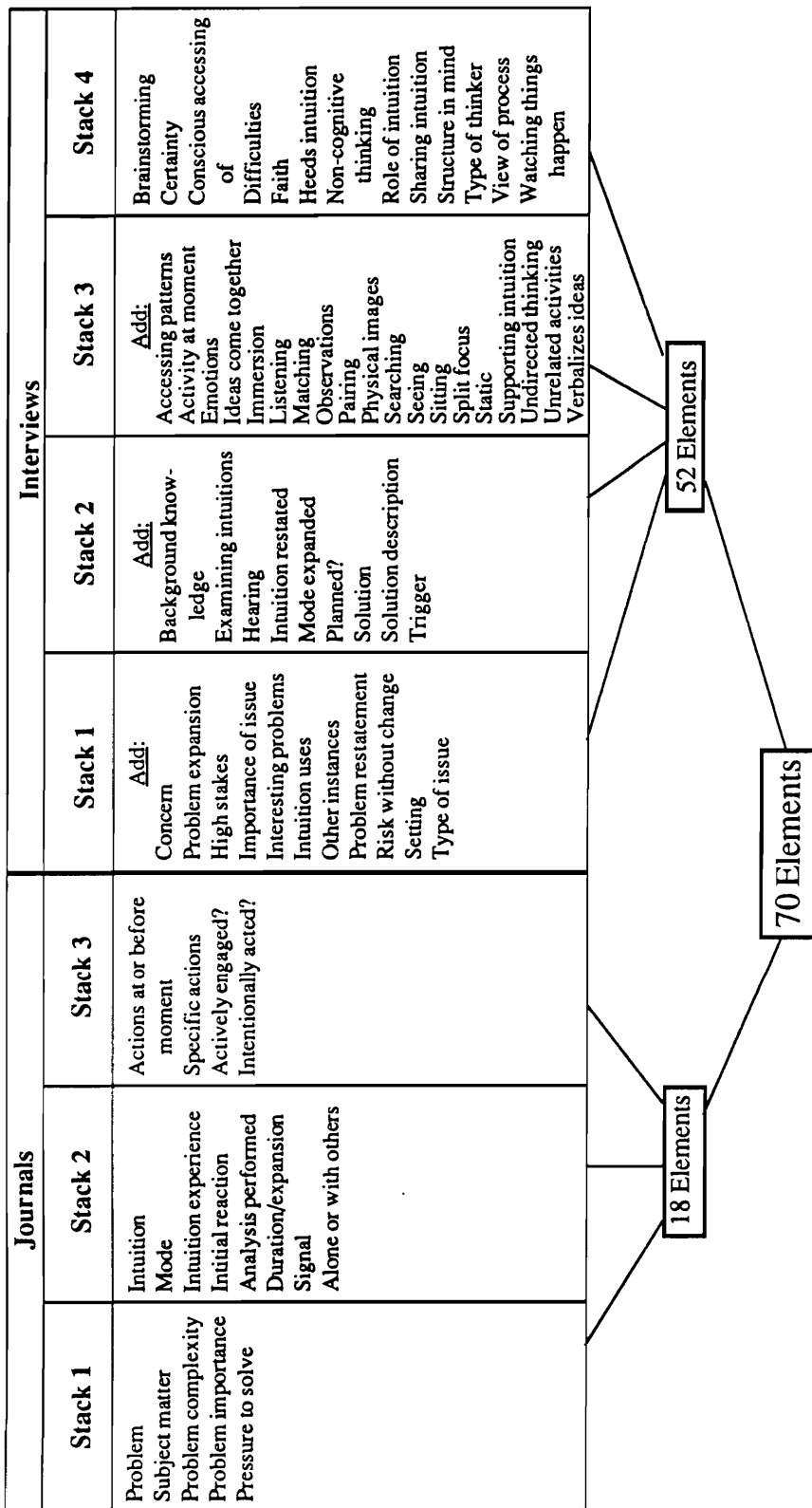


Figure 6
STUDY ELEMENTS

valid, that is, reflect or match reality, this research involved participants in a number of different ways throughout the process (Merriam, 1988). Participants verified the accuracy of transcripts and of the narrative summary, and provided clarification where needed. Additionally, five different approaches for gathering data were used: initial meetings, participant journals, formal interviews, follow-up notes or comments on transcripts, and informal discussions (Miles and Huberman, 1984). Use of multiple sources and methods helped confirm emerging findings. This use also highlighted differences between data obtained from journals and that from interviews. In many instances, information from the in-depth interviews expanded on or amplified participants' spontaneous journal comments.

My work plans, copies of participant materials, and this report which chronicles procedures and stages of analyses, make it possible for others to follow what Miles and Huberman (1984) call a "chain of evidence" in reviewing findings. Findings are presented in a way that the reader can discern the inductive processes followed. Researchers who wish to review the process, either to verify the procedures used or to carry out a similar study perhaps with a different group, may use this chain or its trail to investigate or repeat the process.

Conclusion

This chapter has provided details on methods to study strategies and tactics used to access intuition. The research is inductive, generative, constructive, and subjective (Goetze and LeCompte, 1984). The data collection and analysis methods employed supported that purpose. The study's participants were 11 human research development professionals who

recorded and discussed information about the strategies and tactics they used to access intuition in solving ill-structured problems.

Participants had several opportunities to interact with the researcher and to reaffirm the accuracy and interpretation of the data. Each participant was initially interviewed. At that time, both the study process and potentially appropriate problems to focus on were addressed. Then each person completed a journal that described a complex, ill-structured problem that was encountered, the intuition that occurred, and the actions taken during or just before the moment of solution. Participants' materials (*Appendix A*) provided definitions of key terms and questions to serve as documentation guidelines. Each participant then participated in a 45- to 60-minute interview. During the interview, participants provided more information on the instance described in the journal. They also described other instances where they accessed intuition as well as their reflections on intuition processing.

Participants reviewed transcripts of the journals and interviews for accuracy. They also examined a narrative I wrote to determine if I had correctly understood their statements. Finally, two participants, themselves researchers, reviewed data drawn from both of their interviews and journals to ensure that the classifications and groupings I made seemed reasonable. They corroborated the results.

Data were presented and analyzed in several different ways. First, each participant's experience was encapsulated in a narrative format (Chapter 4). These vignettes provide the rich descriptions that are a key value of case study research (Merriam,

1988). Through them the reader can see the actions each person took within the context of his or her particular situation.

Next, journal data were compared (See Chapter 5, Part 1). Using the constant comparison method (Glaser and Strauss, 1967), data were tagged and classified into 18 separate elements, grouped into three categories. Then, data in each category—the problem, the intuition, and the action—were compared. Through this analysis, some similarities among the cases were documented.

The process of category construction was then extended to the interviews (see Chapter 5, Part 2). An additional two categories were identified and discussed. These are titled “Actions to access intuition,” and “Participants’ perspectives.” This analysis expanded on data provided in the journals. It incorporated additional detail on participants’ actions at the moment of solution, as well as other examples of accessing intuition.

Finally, the dynamics of accessing intuition were addressed. Interrelating data among participants and across categories, I gleaned the beginnings of a model of how people access their intuition in solving problems (see Chapter 5, Part 3). The proposition arrived at is: A propelling concern to solve a complex problem leads to continuous search and spontaneous combustion. This deeper analysis boards on the edge of what Goetze and LeCompte (1984) call substantive theory—the first of three levels of theory development. However, this juxtaposition of ideas is presented as a synthesis of what I observed in this case study, rather than a prediction applicable to all situations.

CHAPTER 4: FINDINGS - INDIVIDUAL CASES

Introduction

This chapter documents and describes some of the study's findings. It addresses the question: What stories did the participants tell about their experience in accessing intuition? The chapter includes vignettes containing the salient points of each individual story. These vignettes are narratives based on the journal entries and interviews (reviewed by the participants for accuracy). They have been supplemented by actual quotations from the journals and interviews.

Each participant in this study chose a problem he or she had solved by accessing intuition. Each story is different. The situations, the approaches, the types of problems all varied. Through these stories, one can sense how the moment of solution happens for individuals in the workplace who are human resource development managers. Fischbein (1987) points out that it is through particular examples that we come to abstract concepts. It is my hope these particular stories will help us understand more about the strategies and tactics we use to access intuition. Each vignette describes the person's problem, the situation, the intuition, and the process followed. Most vignettes include participants' perspectives and some denote additional instances where intuition was accessed.

The information here includes a synopsis of the events participants described, as well as quotations from their journals and interviews. The names of participants have been replaced by pseudonyms to ensure anonymity. Additionally, specific identifying information on their organizations has been omitted. These descriptions enable me and

other researchers to see the actions and strategies individuals took to access their intuition in the context of the situation. This contextual information will help the reader understand the participants' experience and may itself be a factor in the type of experience participants have.

Bill

Bill is in a senior level corporate role in a 4,000-plus person contract research firm with annual sales of more than \$300 million. Educated as a scientist, he holds a doctorate in electrical engineering. With a great deal of experience as a general manager, and now a Corporate Vice President responsible for executive and management development, he describes his current role as that of an "organization change agent."

The problem

Bill's problem involved gaining the commitment of senior executives to a new executive selection process. In his organization, promotions had been determined on the basis of a single manager recommending a subordinate for the promotion. Bill saw his problem as "gaining strong commitment from [the] top two layers of management [for] a more effective and systematic approach to recruiting and executive selection." To him, the problem was highly complex and "involved seizing the moment and approach for addressing major personal issues of 12 top executives who have strong views. There are multiple possible approaches. The 'straight-forward' approaches have historically produced tepid commitment." Describing the situation, he explained that the new system,

which the company ultimately installed, would involve three people and require top level personnel to participate in interviewing training. He felt . . .

the problem was to get people, whose natural motivations would be to hoard power and avoid training in something as simple as interviewing, . . . to change and to really embrace; more than just to set up a committee.

In other words, he had to successfully implement a system requiring delegating and training within a group that naturally resists such things. A key step was to be for the top executive to agree to the new approach that Bill presented during a meeting. Bill saw a major risk in not acting to improve executive recruitment. For him, people are the determinants of success.

The situation

Previous evidence convinced Bill that the existing approach to executive recruiting and selection was not working as well as it could. He wanted to institute a new approach within 60 days. For Bill, the moment of solution occurred at a meeting being chaired by a peer. The organization's top management was discussing performance problems of people who had been selected using the existing system. While listening to the discussion and observing signs of distress or frustration that senior executives were exhibiting, Bill realized they would be receptive to change. At that moment, he believed he could catalyze the entire group rather than deal with each individual. To Bill, his intuition was not just

arriving at the appropriate recruitment and selection process, but determining when to propose “the teachable moment.”

The intuition

In Bill’s words, he “had already located effective interviewing training, growing out of XXX’s assessment centers.” Now, the “big issue was finding a practical way to get top management trained and improve [interviewing] batting averages. Pain/opportunity pairing should prompt commitment.” His intuition was that all 12 executives were feeling great frustration and pressure at the “moment of intuition” and would be receptive to any demonstrably viable approach. Additionally, “results of informal discussion showed that groups of three assessors did much better than single assessors and the ‘technology’ of targeted selection has already been demonstrated.” Thus, the solution to receptivity was to: “1) pair pain with opportunity; 2) point out that solution capitalized on their demonstrable strengths as a team; 3) reveal that studies had already proven effectiveness; 4) don’t oversell; method greatly reduces, but doesn’t eliminate poor selections.”

The process

In describing the process that occurred, Bill noted he:

- Was looking at body language and discovered the senior executives were experiencing great pain and frustration with current interviewing process.

- Was listening not only for words but for the messages behind those words. He thus “sensed the people’s personalities, their desire for structure combined with the pain that they were feeling.”
- Saw symbolic data packages and heard the key words “evaluation team” and “interviewing.”
- Felt part of, yet outside of, the group. He observed “again without thinking cognitively, that this group was owning their issues. They realized they were the problem.”
- Was embodied with a sense of “teamness,” felt he was communicating “team” and was “pairing the warmth of team with the coldness of individual and analytical.”
- Did not cognitively think, but “paired pain with opportunity.”

Bill indicated in his journal that while he had previously investigated the specific approach to recruitment and selection he proposed, he had been considering a different application for this approach. While he knew that there was a statistical base of validity to the approach, “executive selection was the furthest from my mind.” Yet, observing individual behavior as well as group dynamics, he knew when to suggest the new system.

Other instances

Bill indicated that he used his intuition a lot in “sensing what would change a group, how much is too much, and when is it too soon. And do they want that.” He described an instance on the evening before the interview where he had sensed a group’s receptivity to a way of framing their role and thereby make a change. At that moment, he made a speech that “I’d never made before and never thought of before.” He presented the group with a framework that “I hadn’t ever thought of before.” That speech framed things and committed the group to change.

Sometimes, and in some situations, Bill said he would:

consciously access my feelings. I’ll sit quietly. Sometimes it takes a minute or two to really get close to what those feelings were and sometimes, if it comes more slowly, I will think about a problem a lot. With a lot of problems, I steep myself in [them] and I try to look at various ways to frame [them]. And sometimes an insight will come, but it’s not so much deductive—first a description of a problem and then a listing of alternatives and then a testing. I only do that when my back is against the wall. That’s an absolute fact. Once I come up with [the intuitive solution], I will go back and say what are some alternatives and are there any alternatives at all?

Dana

Dana is the editor of a magazine that focuses on human resource issues. She has twenty years of writing experience and seven in HRD.

The problem

Dana decided to describe the process of choosing a topic about which to write an editorial which she defined as editorial planning. This is a complex issue which involves understanding the magazine's readers and their interest, a knowledge of the field itself, and an understanding of the direction the magazine and of the sponsoring association. According to Dana, each month there are many "right" answers to this problem, but "none so right they would preclude others." Moreover, the possible topics need to be approved by the highest-ranking officer, the actual topic needs to be chosen, and the editorial written in time to meet production deadlines. In the beginning, because of Dana's newness to the field, the risk of failure to write an appropriate editorial in time was high.

Dana described the problem this way:

For sixty months in a row I had the responsibility of writing an editorial for the magazine of which I am editor. Every month I had to solve the same problem: what to write about?

The problem of choosing a topic has two parts: what is your subject and what are you going to say about it. In an editorial, [because of its short form], there isn't space to roam around in an idea. You must make your point in the space of one printed page. Not all ideas do well under those constraints.

Another part of the problem had to do with the size of the field covered by the magazine: all of human resource development plus certain aspects of business, adult learning, and the behavioral sciences. How do you single out a worthy topic from this great mass of potential material?

Still another part of the problem concerns the audience for the magazine. Of the xxxxx readers, some are very new to the field, some have been in it for thirty years, and some are in between. In addition, most readers have some special interest within the field and tend to lock their radar into that area and exclude or ignore almost everything else. The readers are busy and there's a lot competing for their attention. So it is a challenge to find a topic that will appeal to the novice and the world-weary at the same time.

The final part of the problem was that I had to find a topic, write the editorial, and get it approved in a very short period of time. I couldn't waste any time on false starts or topics that wouldn't yield some fruit. And then a month later, I had to do it again. If I didn't get it done, the magazine would go to press anyway.

The situation(s)

Dana's intuitions about an editorial topic almost always come when she is doing something unrelated to work; for example: during commuting, cooking, unrelated reading, and jazzercise classes.

She noted:

Intuitions seem to come most reliably when I've left the problem alone for a while. I might have thought about parts of the problem earlier, and I'm sure I do a lot of sorting out of bad ideas by an almost unconscious process, but intuition never comes on demand. I can set the stage by feeding in some elements to consider, but I can never sit down and consciously follow a set of rules to reach an insight. [When I do,] what I get is a pancake instead of a souffle.

The intuition

For Dana, the moment of intuition, when she selects her topic, is like the moment of deciding to press the shutter on a camera. As she emphasized, "The moments before and after the photograph might be equally true, but my intuition selected a particular one to capture. It was as if the confusion of elements in my head suddenly fell into a pattern that matched the template I had for what a good editorial should be." The image Dana has is actually of things moving around into place to form a pattern. She said:

Just before an intuition about an editorial, I have often been thinking about deadlines for the magazine, or how I'm going to manage my time during the coming day. But sometimes I'm just daydreaming. . . . My initial reaction was always relief (that I had a topic) and pleasure that the process had worked again. In a creative occupation such as writing, it is important to keep one's intuition working. . . . The intuition came in a quick flash of understanding, of knowing how the story line would go. I might immediately think of a first sentence or a title, but other details would come later when I sat down to produce the editorial. The intuition gave me the topic and the slant.

The process

Dana explained the process she followed and provided an example from earlier in her career. She remarked:

I set up the problem for myself. I look at all the elements, and I think about it pretty hard. Sometimes I'll do background reading or I'll talk to people. I'll concentrate pretty hard on all the parts, but I'm not really looking for the solution. I'm just building on a foundation. And then I have to go away for a bit. I reach a saturation point. I have no ideas and I know I'm going nowhere. Then I just totally get away from it. Sometimes it just is a matter of getting up and taking a walk, leaving my computer or doing something different for half an hour; sometimes it's sleeping on it overnight. Then, usually, when I've cleared a space, the intuition will come.

I'm thinking of [an example] I wrote very early on when this was much more of a problem because I wasn't familiar with the field. I had decided I would write about career development because I had just been to a mini-seminar where some people had been presenting some information on career development. So I knew that my general topic was going to be career development. But I didn't know what I was going to say about it. I had notes of all of the things that the presenters had said. It was all pretty general. There were no amazing insights to report on. Nobody had done any significant research, it was just this general "good stuff" we ought to know about career development. I thought about it and I made a lot of notes and rode around in my car thinking about it in odd moments. And suddenly it came to me.

My children were younger then, and I kept a box of costumes for them throughout the years when they were young. They used to enjoy going and taking stuff from the costume box and playing different roles. Somehow I put together the idea of them doing that with what I had heard in this career development seminar. . . . There was an aspect of it that focused on helping people match up opportunity with sort of native skill and putting those two things together. And somehow, in my mind, I brought together these two images and that's how I started out the editorial by writing about this costume box and how career development was in a way a kind of costume box.

This was about five years ago and was one of the first editorials I wrote. I remember it very clearly; I was really struggling then. I didn't want to give a

bunch of platitudes back. I wanted to give it a unique, hopefully personal angle. Somehow these things just came to me. These two ideas connected—that was the moment of intuition.

Dana finds that this happens to her often. She explained:

I am looking for an image to hang a story on, I'm looking for an angle and sometimes I'll find it in some totally unrelated field. You know, all of a sudden, two ideas will come together in some way, and I will see a connection. That will be the start for me of seeing the form the article is going to take. I'll find it when I'm reading fiction or I'll find it when I'm engaged in some kind of athletic activity, or, conversation with someone about something totally different.

She noted that she considered which of her senses were involved as she completed the journal. She described the many dimensions of her experience which included auditory, kinesthetic, and visual elements, as well as a spatial component. She continued:

It's more like hearing something on the radio in your head. . . . I don't know that there's a visual image, but there's definitely a sense of a lot of elements floating around and then all of sudden coming together in a pattern. And it matches a template that I have somewhere in my head about what this story is supposed to do. So it's visual, I think, but certainly in my head. . . . When I'm thinking of what happens in my brain, the images I get are actually of things moving around into place to form a pattern.

Dana noted that she always knows when she's reached a point where she can't do any more. She explained, "I don't sit there and bang my head. I mean, I've done this so often now that I know when it's time to quit, when it's time to back away."

Dana's perspective

Dana seemed very knowledgeable about her use of, and access to, intuition as well as being comfortable with the creative process. She noted that she usually didn't analyze her intuitions, saying, "They usually serve me very well, and I think I am afraid to damage them by too much analysis. Also, I have found that the energy produced by the intuition helps the writing."

She sees herself accessing intuition very indirectly. Dana explained:

I open the door for an insight and try to put myself in a clear state of receptivity, but I can't turn it on like a tap. I can get rid of distractions and I can push the problem up to a high level of consciousness, but I haven't yet learned how to trigger those brain synapses that produce the flash of insight.

Dana stated that her intuition never comes on demand and that brainstorming in a group is very difficult for her. Instead she creates the conditions under which insights occur and puts herself in the "right frame of mind." Dana indicated that it has taken her many years to realize that there is a point at which you can safely stop working knowing

that eventually, “when you come back to it, something will be there.” She also reported an increasing recognition that she has more of a structure in her mind for picking topics than she thought and what may have seemed like daydreaming, might be resting on a scaffold. She amplified:

I guess the big insight for me was to discover that, in this process of examining the field and picking a topic from it, over the years I have set up a sort of a superstructure, a grid so that there’s a foundation that I don’t even think about when I’m choosing topics, but it’s always there. It’s my knowledge of who my readers are and what they care about, what percentage of them are new and what percentage are experienced, how many of them are doing management development vs. career development. Plus my knowledge of the field which changes and shifts all the time as the field itself does. Plus a sort of third aspect which is where XXXX is going and what role the magazine plays in that.

Don

Don is the personnel manager in a company that builds communications systems for the military. The company’s revenues are greater than \$300 million annually, and the 400 plus employees are primarily professional and technical people. Don is responsible for employment, EEO, benefits and compensation, and works with line managers in hiring and other employee issues.

The problem

Don was charged with recruiting and hiring 4 to 8 senior-level engineers—each with a different technical focus. The candidates he was searching for needed very specialized communications systems backgrounds and extensive experience. To find them, he chose to prepare an employment advertisement to be placed in various local and national newspapers and technical trade publications.

Don saw two special challenges associated with this task. He explained that the experienced professionals he needed to reach would likely be too technically oriented and too mature to respond well to the “types of syrupy images and appeals that might work well in a Pepsi commercial.” Second, he noted, it is more difficult to create a theme which will appeal to four different types of candidates than one which will attract just one group.

To Don, while there were hundreds of decisions to be made in the course of writing a 4" by 10" advertisement, the most important decision was also the most creative one, and the one which most strongly employed the writer's intuition: the creation of an ad theme. He considered the task a reasonably complex one and noted that: “There are certainly an infinite number of possible ad themes which could be offered as alternatives for this ad campaign. If you asked 20 ad writers to create an ad, you would likely get 20 different themes. There is no one right ad.”

The situation

Don worked alone to solve this problem. He spent two hours of work generating ideas over “a couple of different days.” He explained that he did not just “sit down and do nothing for two hours and make the list,” but compiled it at different moments when he had time to work on it.

The intuition

The intuition included both an image and a phrase. Don explained that:

The idea to list ‘the spectrum’ on my list of images was a clear, quick flash. The phrase, “At Company X, opportunities span the spectrum” came to me somewhat more slowly (in what seemed like a two-step process which perhaps took half a second) and somewhat hazily (in that I was unsure about the word “span”).

The process

In developing the ad theme, Don followed an established process, one he has developed for this and other similar tasks. He:

- Thought about the positions and what kinds of people would be required to fill them.

- Considered the potential employees and what their motivations might be.
- Sat back and brainstormed a list of one-word images, sometimes expanding words into phrases. This happened over a couple of different days and in different locations.
- Paired items on the list to generate phrases.
- Moved to a series of physical images.
- “Hit on” an overall theme.
- Tested the theme to see if it would work.

His journal provides a detailed account. He wrote:

At the time I hit on the theme, I was sitting in my office in a fairly long brainstorming session, writing words/images on a notepad. I had written down several physical images: frontier, horizon, the top, peak. I then hit on the word “spectrum.” I started playing with the word to try to make it into a theme/phrase, and came up with “span the spectrum.” I wasn’t quite sure that “span” was the word to use in that context, and I played with the word “scan” as well. The positions I am recruiting for involve engineering work at various frequencies in the

radio frequency (RF) spectrum, and I hit on the ideas that we have job opportunities at various points across the spectrum. “Opportunities span the spectrum” came in a flash.

I played with the phrase at some length, trying various alternative phrasings. I walked around some of the engineering offices to look for possible graphic artwork which would appropriately represent the RF portion of the electromagnetic spectrum; I ended up drawing my own graphics to juxtapose with the ad headline.

Satisfied that this looked good, I laid out an outline of the ad. I wanted a secondary theme line to put in the close of the ad, to push readers to take the action step of actually sending a resume. This secondary theme line needed to fit with the spectrum image, so I played with words like “channel,” “frequency,” “wave,” and “wavelength.” In fairly short order, I came up with “Talk to us at Company X. . . we’re on your wavelength.” This struck me as acceptable, and I was now set on my choice for the theme of the ad.

Don provided more details in the interview. He noted that:

After a fair amount of time had gone by, I started moving into a series of sort of physical images—just completely random in the direction my mind was floating. The top, the peak, wave. I played around with the idea of wave in the sense of like a magnetic wave—like a magnetic spectrum. And I hit on the spectrum. I wrote that down and then came up with the phrase, spanning the spectrum and then

played around with that and came up with the headline of, “At Company X, opportunities span the spectrum,” which is what I am going to use as the headline on the ad.

Don explained that from that point on there was a kind of revision process. He provided a closer focus on how he approached the moment of solution. Don noted that sometimes he “got nowhere.” Although he wrote words down, they suggested nothing. He just didn’t “click” with the word. Other times he arrive at “fuzzy” ideas; played with them, but just couldn’t make them work. In this instance he was listing physical images. Don reported:

I came to the idea of the spectrum and almost immediately then hit on, I was thinking about what is it you do with the spectrum. You span the spectrum. I played around with that for a minute and then hit on “opportunity” which is a word I like. That is a good word in an advertising context. As soon as I paired those two up, I realized that this was a real good candidate. This is probably my theme right here, “Opportunities span the spectrum.” I realized how well it fit with the fact that I have these different engineering positions working in different frequencies. And I got a visual image of the spectrum. That is a familiar image that you see in a lot of the technical literature that I read. I could see how it looked visually and it was a real comfortable idea. I still had that testing process to go through, but I was very confident that it was the one I was going to use.

Other instances

While Don provided great depth on how he accessed intuition in this process and noted that he found it very useful for writing, he explained that:

There aren't many other tasks or any other decisions in my job that might have structured that nicely. I don't have a formula like that I use to crank out a decision when I have to decide whether or not to fire somebody. I don't have a process that I follow. I kick it around in my head. I think part of what makes ad writing different than a lot of other things I do is that it is a creative process. It is a creative process as opposed to making a decision about whether or not to fire someone. That's not a creative process. There is a rational decision-making process with strong emotional input that you have to think through, but it is a very different kind of decision process than coming up with a theme for an ad.

While Don did admit that there was an intuitive component in hiring decisions, he indicated that, in general, the intuitive assessment was one input in a rational process. However, "we will certainly make decisions from time to time that would appear to be not supported by the facts. This person had all the right education, all the right experience, but we just didn't want to hire him. There was something there we didn't think would fit."

Don's perspective

As noted, Don sees designing an ad as a creative process, where accessing intuition is appropriate. He considers other types of decisions as largely analytical. In these situations, he views himself as being very rational in most other types of decisions.

To Don intuition is a generator of options. He believes that the way he thinks is to generate alternatives on an intuitive basis and then assess them and make a final decision on a rational basis. He noted:

I'll lay things out on paper, all the ploys you can use. I'll write out a list of pros and cons and all kinds of fairly structured and at least overtly rational things. It is not that I am oblivious to the personal or emotional implications, but it is a fairly rational process.

But the options may be generated in an intuitive way. I'll hit on an alternative. I will be driving along and listening to a song on the radio or just off in space hit on a possibility. . . . I spend a lot of time, it may not be in the office, thinking about issues. Not necessarily thinking real hard with beads of sweat popping up, but in some loose way have the idea kicking around in my head. For example, if I am going to make a presentation or even if I am going to have an argument with somebody, I will play that through in my head several times. Rehearse it through and think about different ways it might go and things I might say and things the other person might say that I would have to counter in some way.

While participating in the study, Don was in the midst of making a personal decision about job possibilities. He reported:

I don't know how I feel about all that. I can't quite get my feelings sorted out about that yet. I can make a judgment based on rational kinds of considerations, but this is a decision that clearly calls for more than "this one calls for 'x' number of dollars" and "this one has a nicer office." You have to deal with the emotional issues. It's been tough for me in this particular instance to make that decision. I think it is primarily because they are both real attractive alternatives, and it's tough to choose between the two of them. But I don't have a structured way of bringing that intuitive process to the fore. I just have to think about it a lot and hope that it will hit me. So far it hasn't.

Don is waiting for a feeling; the feeling will alert him to the right decision. He explained that it would be unusual for him to make an important decision and not have a really good feeling that he was right. He noted that he didn't have that feeling yet about the speculated employment decision:

I haven't thought about it enough. I have been very much involved in a lot of other things right now and it has just been floating in the back of my mind. But that's good, that's the way I want to do things like that. It will be floating around in the back of my mind and I will think about it a little bit, couple of minutes here, couple of minutes there, while I am in the car. Occasionally I will talk to somebody about

it and get some new inputs and new perspectives and eventually that decision point will come.

Ginny

Ginny is Director of Training and Development for a fast-growing financial services institution with assets of \$6 billion, growing at the rate of \$200 million a year. The organization, with 1,700 employees, has expanded “six times over in the past six years.” While the department she leads conducts management, sales, and career development programs as well as operations training, Ginny has major responsibilities for organizational development and reports to the Senior Vice President for Human Resources.

The problem

Ginny described the problem the company faced as one of staffing the branches with people who are “knowledgeable, quick, friendly, and want to serve the customer.”

The organization had addressed aspects of the problem at differing times with a number of single separate solutions. When a single solution was attempted, trouble broke out elsewhere. For example, when personnel were not delivering services, training was increased. But fewer people passed the training so vacancies increased and the length of time to fill position increased. Ginny said:

The problem presented itself to us in a number of different ways. It felt at times like something that was both exploding and imploding. In other words, we would try one solution to one problem and another problem would break out as a result of the solution we implanted. It just felt like a never-ending cycle. I use that image there as separate pieces of a circle, . . . because it wasn't just one piece. It was lots of different pieces. Every time you would intervene in any part of the system, it would make the problem, . . . break out some place else. So over time it became apparent to us that episodic type of things weren't going to work and that we needed a systems change. And that's the way we began to see it.

The situation

The intuition that Ginny described occurred to her during a meeting while she was listening to different department representatives describe the problem from their point of view. She, in fact, was pressing for the group to move to consider pre-employment testing. Then, the intuition that the company was not hiring the "right people for the right jobs" occurred. She remembered:

sitting in the meeting. . . . We had been talking about different things and the pressures that, well, if you do this it makes it harder here, and all those kinds of things, but all of us wanting a solution to the big problem, which is: we are not delivering the kind of service that we want to deliver. And then, just very clearly, literally hearing myself say, "It is not that we can't hire people, it is that we can't hire the right people do to the right job."

Ginny shared this with the group and “everyone sort of rocked back and started looking at the problem with a new pair of eyes.”

The intuition

According to Ginny “we had struggled with the separate symptoms for a long time,” and her intuition was a “very clear coming together of the pieces to form a new statement.” She explained:

We were looking at all of the problems. The problems had gone on, and we had tried first one solution and then another. In that particular meeting, I remember that I was pressing to get another area to take a certain action. I wanted them to begin pre-employment testing. Then what occurred to me was, well, that may be a great idea, but that’s yet one more of these bandaid kinds of approaches and that too is not going to solve it. What we need is a different kind of person doing a different kind of job. . . . We must select different people, train them differently, reward them differently, manage them differently for the new job.

As a result of her intuition and explanation to the group:

We are making a change. It is a major organizational intervention that will totally change the way we staff our branches, what we pay our people, how we train those people. We think this change will make a qualitative, noticeable, difference in what

we deliver to our customers. And, so a lot of little incidental things are happening. But they are not happening as separate, discrete events. They are happening as a fabric that we are weaving that will allow us to put forth something really different in terms of a design.

The process

At the moment of intuition, Ginny was:

- Listening with one ear to someone talking, and at the same time waiting to hear a message in the other.
- Aware of static or confusion.
- Sitting very still, with a feeling of waiting and anticipation.

Other instances

The description of how the intuition appeared at the moment of solution is similar to other recent incidents. For Ginny, when she is working alone, intuitions are visualized, but when she is working with a group, she verbalizes the intuition without “thinking” it through. She explained:

This happened this morning to me. I was listening to someone talk and my first feeling was that of confusion. Almost like there was static on the line. So, my tendency is to get still and to continue to listen, but also as if I want to listen for peripheral noise. . . . And then it will come to me. It is almost like a new noise will inject itself. . . . I will get an idea and when I get it, it will be in a verbal form. . . . I don't get the idea and think about it. [Amid the confusion, it's there] . . . and I am sort of waiting for it to come together, and when it comes together, it comes together out of my mouth.

Ginny provided several examples of accessing intuition. Through these she presented more details of her experience. These examples highlight the visual and auditory aspects of Ginny's intuitions as well as their synchronicity.

On a panel:

I was [on] a panel and a person asked me a question, and as I listened to that question, in my mind I had the image of a flip. And I said, "I would like to shift your question and change it in this way before I answer." I did so and then I answered it. He said, "that is much more than I would have expected to learn if you had answered the first question." I wanted to answer the question in a way that would be useful to him, but he was looking at that from such a narrow perspective that I didn't want to answer that question. So I had this instantaneous flip in my head.

Working with supervisors:

Again, I sat very still and I listened to what he was saying. Then out of my mouth I said, "If you are asking me if I understand the magnitude of what I am proposing, the answer is yes. That it is cultural change, that it will take years to accomplish, that it is not a training issue, the answer is yes." And once I said that, he stopped. I was listening to things that I didn't expect to hear. They were creating confusion and then suddenly I got clarity that he wanted an explicit statement from me that I understood that we were talking about long-term cultural change and that it was a problem of significant magnitude.

In designing space:

We had to redesign our space here. . . . What I did was go out into the space and look around and let images come into my brain.

I did that same thing last weekend at home looking at an area of my yard that I want to re-landscape. I stood out in the yard and I just looked at it for the longest time and pictures would occur to me about what this could be like and what that would be like.

With a close colleague:

There are times when I went to meetings with Mary, and I would be listening to what was going on, and I would have this static going on, just like a small roar, and I would—in trying to both pay attention and let this thing come up—I would take my pencil to start to try to write just whatever it was, and sometimes Mary would say it. At that point in time I am thinking, “is this thought really occurring in her head and I am picking it up, or not?”

With her husband:

I have had that same thing happen with my husband lots and lots of times. He and I will say to each other, “you sent me that or I sent you that.” I will say something to him and he will be thinking it and we will laugh and we will say, “I sent you that thought ,” or something like that. That happens to us regularly. We are both intuitive type people and so my guess is that what stimulated me to have that thought or idea also stimulated him the same way.

Ginny's perspective

Ginny sees herself accessing intuition in all types of situations, alone and in groups. She feels her staff views her as an idea generator and will seek her out for help solving problems. “So it is like others will access my intuition,” she stated. And went on to explain:

I guess I am a person who will engage other people's problems; when I do that, ideas will come to me. The image that comes up is gears. . . . And it is the idea that will engage the gear that will move you forward. It's letting someone else sometimes bring me a problem that I will get into with them. I will get in the boat with them and ride on the river of whatever this problem is for a time. . . .

I am always interested in engaging a problem and thinking it through. There are problems that seem boring to me and so I won't do it, but generally if the problem is interesting enough to me, I will do it. Sometimes it is risky; therefore, it's exciting and I will do it. Other times it is clearly outside the scope of what I feel I am capable of doing successfully, and I walk away from it.

And on those occasions where she is working with people, "the ideas verbalize themselves."

Ginny is aware of her ability to let ideas emerge and sees the static as a signal. She described the static:

It is like a noise. It is also like a confusion in the sense that I am not sure, a puzzlement, a wonderment. Out of that will emerge an idea. It is almost as if there are metaphors; it is not these things, these are just metaphors for it. It is a fog that you see a shape in and the shape emerges. It is a confusion that is there but not an unpleasant confusion, something that brings with it a certain amount of anticipation

and out of that will come the idea. Clarity. Or it is the static—almost like the static on a radio—that fades in and fades out and when it is there it is covering something up, but when it goes away, you can hear. So it is all of those things.

In explaining an incident where she was helping someone design a training program that occurred the morning of the interview, she stated:

I sat very still because I had this confusion going on and she continued to talk a little bit, but I was really waiting to hear the message out of my brain about what was the idea I had. . . . It was almost as if I was listening with one ear to that and waiting to hear out of my other one. It is sort of the way you would be if you were watching a television program, but listening for noises from children at play to make sure that they are OK. They are quiet and you get up to see what they are into. You are aware of, and paying attention to, the quality of that noise, but you are not listening to the words that are being said. . . . I think that it just happens to me, but when it begins, instead of saying, “oh I am not paying attention to her, turn it off and listen to what this person in front of me is saying,” I say “something over here is happening. Listen to it.”

When asked if she always “listened” to her intuition or sometimes decides against it, Ginny noted that many times she had not followed an intuitive lead “when my intuition does not support something I want to believe.” Also, many times she had acted on her intuition and been sorry. She noted:

I am sure that those times when I am sorry are the ones that I remember and the times that it turned out OK, are the ones that I don't remember. I have had lots of intuitions about my children being dead in a ditch someplace when they were late and they came home and they were OK.

Ginny finds it interesting that, "once I move from intuition to a decision, I usually can put all of the pieces together to support it in a logical way. . . . I will just know. I am not sure that I marshal the ones that support my position, which is possible, and ignore all the rest of them, but I usually can pick out those facts that will do it."

Jan

Jan is a senior HRD program manager with more than 22 years experience in the field. She is currently in a leadership position in a multinational corporation that provides information management, real estate, and finance services.

The problem

Jan's problem was a strategic one. She had to determine how best to approach her boss, a corporate vice president of a multinational corporation that provides information, management, real estate and financial services, and ask for two contract employees to become permanent employees in the company.

Jan's problem was compounded by the fact that she saw her boss rarely because he worked on another coast. Moreover, he had begun to take action to hire the people as exceptions to the freeze. However, she then got a message from him that the headcount was to remain absolutely flat. Jan felt she had pushed the VP as far as she could, particularly since she did not know him well and did not know what pressures he was under from his superiors. Yet, she felt it very important to her function to hire these two instructional designers. The issue was compounded by the fact that he was considering her for a higher level promotion. Moreover, she later found out that he had been asked to cut four people from the headcount.

Recognizing her problems and her need to communicate with the VP, Jan had written out a scenario of what to say to her boss and decided it wasn't right. Driving home from work, she listened to the car radio, halfway thinking about it and halfway listening to the music. All of a sudden, an idea went "foomp" into her consciousness.

The intuition

Jan's idea was that she needed to see her boss personally and that she needed to connect her request for the exceptions to the business issue. To Jan, the intuition had two pieces. She explained that it was obvious that the headcount issue/decision didn't reside with her boss, and that she didn't know how far he was willing to or could go to resolve it. In addition, she needed "to let him know my position to greater depth and at a more personal level than a VMX (voice message) will allow." When she was driving home, she suddenly realized she had to see him personally.

The process

This personnel issue was one Jan had been worrying about and discussing with her husband (a course of action she rarely takes). In thinking about the problem, she was trying to “lay out my case in such a way that my boss would see very clearly the impact on the business if we were to lose these two people.”

She was doing this without really knowing all the players and without knowing anything about the politics affecting her boss because of corporate-wide freeze. Moreover, she had been experiencing “strong ‘gut’ feelings of discomfort around the whole situation.”

Then one night on the way home from work, a solution became apparent. She explained:

It occurred to me that what I had to do was see him personally. . . . I hadn’t really clarified it until I had sort of [had] an “Aha” driving home, that I had to lay out the business problem, and put it in terms of our whole quality process, one of being most sensitive to personnel issues when they affect people who have a direct interface with the customer.

Jan did get to visit with her boss and proposed that the two instructional designers receive permanent positions because they worked directly with customers or one step removed. Since the company is most sensitive to personnel issues when they affect people

who have a direct contact with the customer, Jan was able to link the instructional designers' predicament with the corporate policy. She also recommended to forget the senior staff position she was vying for on the basis that it was three steps removed from the customer and she could continue to provide quality service without it.

Other instances

Jan frequently gets such insights while driving or exercising. Not a person who brings her work home, she sees herself as "wallowing" in difficult problems and trying to leave them at the office. Sometimes, ideas pop into her head on the way home. If they are related to major problems, she frequently intentionally allows them to incubate, and often they come back on her subsequent return to the office. In other situations she "bounces" ideas off her colleagues.

Jan's perspective

Jan pointed out that she was very conscious of purposely allowing ideas to incubate. She noted that she gets ideas in exercise class and used to get a lot of ideas when running. She amplified, "I've made some career decisions when I was running. Something would pop in and I would say, yeah, that's it. I'm gonna do it."

When asked if she heeded or listened to her intuition, Jan affirmed that she did. She pointed out "sometimes I act on it and sometimes I don't, but I always listen to it." Jan had difficulty coming up with an example of when she had acted on the basis of intuition

and was wrong. When asked if she had acted and been wrong, she replied, “probably, because I do act on my intuitions a lot, and I think when you do, a certain percent is going to be inaccurate.” However, the example she provided was of a career change that she decided to make but eventually vetoed because “it wasn’t right for me. It didn’t work.”

Jan’s approaches to capturing intuitions have changed over the years. There was a time when she kept a pad and pencil by the side of her bed. She noted:

I used to do it because I would wake up in the middle of the night and write poetry. Or I would solve a problem and I’d capture it [the solution]. But I don’t do that anymore. When I look back at the period of my life . . . I realize it was at a time of very high emotional stress.

However, today, her intuitions sometimes occur in the car commuting an hour each way to and from work. She says:

It’s a good thinking time. I very frequently turn the radio off and just hash stuff through. But when I’m not stressed, I find I just turn on the radio and listen to music.

Jeanne

Jeanne, in the human resource field since 1972, does consulting management training and team building in a high-tech data communications company.

The problem

Jeanne and her husband had been wrestling with this problem for ten years. Their task has been to design a complex game called *Community Connections* which would help the players build a sense of community. Finding closure on this project is very important to Jeanne's husband and she felt they moved a step closer when she created a scheme for moving the pieces around the board. Jeanne sees this game as complex, a game that an intellectual or thinking person would want to play. The game's object is to get 25 points by "participating" in building a community.

The problem she and her husband, Sam, solved was to come up with a rationale for the point system . . . They had previously decided that to keep the game from going on indefinitely, the person that first reaches 25 points would be declared the winner. They had also realized that they needed some "kind of overarching way to explain why 25 points and what kind of moves would get you to 25 points."

The situation

Jeanne and Sam were on vacation driving in a car halfway between Michigan and Washington when they began discussing the game again. Jeanne wasn't thinking about it a whole lot and explained it this way: "I was looking at the clouds, I was thinking that it was a pretty day, and then it just sort of hit me."

The intuition

Jeanne and her husband had been discussing the fact that all of the moves and all of the points weren't really alike. Then all of a sudden she had the idea to relate people's moves on the game board to Maslow's hierarchy. This one 'decision' enabled the two of them to integrate the game and to devise a scoring system. She clarified:

Sam was saying something like, "This thing is so complex, if people want to play it we have to show them some rationale. What do the points really mean? . . . I was sitting there looking out the car window and all of a sudden I had an intuition. The way to explain the points would be to use Maslow's hierarchy of needs, because when you look at what people really do to self-actualize and to get connected to their world, they do kind of go through a series of phases. . . . When that intuition fell in place, we could develop a point system and we could say to people, "within each of the five areas of the hierarchy you need to complete five moves for one point apiece." So, therefore, you're sort of building sequentially to get to the 25 points. And it's not just 25 points with moves around a board that make no sense.

The interesting part is that once we came up with Maslow's hierarchy of needs, we came up with the prototype of what the game board should look like, and we came up with the prototype for what the individual playing cards would look like; in other words, what each individual player would be using as they play the game in order to keep their score.

The process

The six hours that Jeanne and Sam spent in the car that day were but a few of the many hours they had devoted to this topic. When asked what she thought was different this time, Jeanne replied:

Part of it was the environment, just driving along, not necessarily being in our habitat with our own lives. . . . When you're traveling, regardless of how you are traveling, it's like you're in a different space. And what was different was the different context. It was just a conversation that came up. He started talking about the game again, I had my notebook out, and I had been making notes on some other things I was thinking about, and we just sort of started talking about it. It was different.

One of the things that was easy about it was there wasn't a time constraint. In other words, we were half-way between Michigan and Washington. We were going to be traveling anyway and we didn't have a deadline. I mean, it wasn't like "come up with the answer in an hour." I'm sure other people have different experiences with

intuition and say, “well, I get my best intuition at the 11th hour.” But I generally don’t. My mind—the analytical part of my mind—has to be disengaged and then I have some kind of Gestalt that comes out from somewhere. Most of my intuition is auditory: I hear the words in my mind. It was like an inner voice that comes on, and it comes from out of nowhere.

Before Jeanne heard the voice, she related she: “was just aware that my mind wasn’t thinking about anything.” She expanded:

It’s as if you’re meditating, and if you are a really good meditator, you get to the place where your mind is a void and there’s not a conscious thought there. The mind might be working at some level, but it’s not turning. Well it’s that kind of state—just like it was nothing. I just wasn’t thinking about a whole lot. I was looking at the sky, looking at the clouds. I was thinking that it was a pretty day and then it just sort of hit me. . . . I was listening, and I was interested, but I wasn’t so focused on it that I was saying, “Oh, my God, I have to come up with an answer.” And I was just thinking about it and I was listening in the conversation but I wasn’t so engaged in it; I wasn’t really focused. Not half-way listening, but listening to what he was saying, and my mind really didn’t have a whole lot of thought except just listening to his words. It sort of popped up.

Other instances

This situation was typical of how Jeanne experiences intuition. She noted, “it does not come from any rational part. I’m not aware that I thought in any kind of linear pattern. As a matter of fact, usually if I have a good intuition, it’s sometimes like I think in the middle of something.” She continued:

I don’t always think about the first step in something or what’s the first phase of something. I will sometimes see the whole problem, but I don’t always think about what I need to do first or second. I just have an intuition that there’s a way to go and I’ll just go with it. I don’t necessary have a lot of hard facts or data that I should do that. And then sometimes after I’ve had the intuition in kind of Gestalt, then I can go back and be sequential about it. But not always.

She provided an example. She had been charged with selecting a media consultant to work with top executives in her company. To her, a more logical approach would have been to identify the criteria necessary for a media consultant and then find a consultant to fit those criteria. That was not Jeanne’s route. Instead she obtained the names of about seven media consultants and called them. She began “to have dialogs” with them and tried to “understand what the universe of a media consultant was like.” Through informal conversations, she told them what she was looking for and began to formulate some criteria in her mind. Simultaneously, she was informally conversing with the six or seven people who were going to go through the training. She explained:

Data was coming simultaneously. It was coming from the executives. It was coming from media consultants. Then it was sort of at that point I put it together, and I came up with the criteria because then I knew I had some sense of the differences in media consultants and then I had some sense of what the executives wanted.

When she wrote the criteria, she was sitting at her desk with a yellow pad of paper and was “doodling the criteria.” She amplified.

It just came to me. A lot of it was based on what I heard. At that point I said, ‘Okay’ and then, ‘What’s the criteria?’ and I just came up with them. It probably took me five minutes to come up with the criteria. Then from the criteria, I wrote a statement of work, and then I picked the three or four media consultants that I honestly wanted proposals from and sent that out to them.

Jeanne will consciously take action to access her intuition. She reported:

If I want to use my intuition, I have to quiet my mind and . . . cut out whatever sensory data there is. I am aware that I get in a meditative state. I’m aware that I cut out at least what’s going on around me, which drives people mad. If I’m listening, for example, to a problem, and I really realize that rational analysis is not going to work here, I would sort of tune out the data. I’ll listen to it, but I don’t get real intense about it. I’ll just quiet my mind and, before I know it, the intuitive part

of my mind starts to work. Maybe that's the right brain. Sometimes it comes as auditory. Most of the time, it's that way. Occasionally I see pictures.

Jeanne believes that most of the time when she's trying to use her intuition, she is alone. However, she provided an example of a group situation. She was at a meeting with members of an organizational unit who were trying to articulate what they saw their problems to be. Jeanne had been asked to lead a session to address some of these issues. She noted that she kept listening to them "talk around and talk around." She was listening to the vice president of the group talk and his director talk "and I was listening to the Human Resource manager talk and they were all telling me these different things." She was looking for some kind of intuition and asking herself, "What is it that's really going on here?"

She explained that then her "mind got very quiet," and she was sure they thought that she wasn't engaged in the task. Then she had a hunch that the people wanted to use their systems for strategic projects, but were using them for tactical projects. Jeanne explained that while sitting listening, "my inner voice (which is my voice) said strategic and tactical and then the next thing that came to my mind was that I remembered an article that I read in the 1985 Sloan Management Review. I realized that the article had some data that would be useful to me."

Jeanne's perspective

Jeanne sees herself as an inductive thinker who goes out and gathers data, then develops a theory. She always heeds her intuitions and cannot think of a time “when my intuition has failed me.” According to Jeanne, the analytical part of her mind has failed her quite often and sometimes she is “guilty of faulty analysis.” But when it’s an intuition and she sees herself as failing, she knew the intuition was right, but “I took somebody else’s view of the problem.”

Lynn

Lynn is a Training and Development Specialist in a company that she has been with for more than 10 years. Originally a research chemist, Lynn went back to school to obtain a Master’s degree in human resource development after she had been working in the field for some time. She designs and conducts training programs and has primary responsibility for most of the employee development courses and some of the management development courses in her company, a leading data communications firm.

The problem

Lynn had just a few hours to condense and shape a presentation on an outside thinking program on customer services for delivery to top management. Her goal was not only to help the group learn the program content, but her design also had to help increase the group’s commitment of the idea of customer service and gain their commitment to have

all employees receive the longer version of the training program. In addition, the management group had to attend the training from 6:00 p.m. to 9:00 p.m. for three evenings, and the company president wanted to use this occasion, one of the few opportunities the group had to meet, to do some team building.

The situation

Lynn was familiar with the outside program and had been certified to teach it a year earlier. She, her manager, and her client all saw this as a very important training session with the opportunity to refocus the company's attitude towards customers. She closeted herself in the classroom where she would conduct the training, surrounded herself with the course materials, immersed herself in them, and started to read. Within five to ten minutes, a thought "zipped" into her mental focus, and she knew she had to play Tom Peters' video, "Beyond Close to the Customer." At the same time, she wrote her own thoughts on flipcharts. When she had completed two flipcharts and heard Peters' voicing the same thought on the video, before she began her design, she knew instantly that the program would succeed and the vice president would buy into it. She said she "knew how to start, when to finish, and when there was enough for the desired results."

Lynn's project was successful "beyond our wildest dreams." The president wanted everyone trained in the concepts and praised the team building that was achieved.

The process

Lynn listed the specific actions she was engaged in just before the overall problem solution occurred. She wrote that she:

- Surround[ed] self with course materials.
- Started working.
- Intuitive flash came out of nowhere about five minutes into the project.
- Had heightened anticipation and fully expected intuition would come through at one time or another—didn't know when.
- Emotions kicked in as well; felt something would happen.

She noted, "I was beginning the journey without a map, not knowing how to proceed. Things hadn't come together yet. . . . I just starting expecting that, sooner or later, intuition would kick in."

While she did not report a clue that an intuition might occur, she indicated that, "I did have heightened emotion. . . . Intellectually, I was beginning to work, emotionally I was anticipating, and it happened."

As Lynn explained :

All of a sudden it dawned on me and when I say “dawned on me,” it was my intuition coming into play. It all was there. Exactly how I should handle the program. What I should do, how I should deal with the design. As I started, things just began falling in place. I knew what to leave out, what to include, how to approach it . . . how to keep them interested, how to do a little team building around it. It was just there. I went along with what came to me. It was extremely successful.

She provided more information on how the intuitive process worked for her in this and in other instances.

I was gathering data and I was reading, but what happens is different when I know the intuition is going to kick in. I expected it would. I was also under a big time crunch. I had to produce and deliver that day. So I just expected that it would work. I knew that it was going to work and it was going to work well. And it's a feeling that comes over me. And when this happens—I hate to use the word that I have faith—but that's basically what it is. But I never know when it's going to happen. I know it's going to happen in time and all. But I don't know if its going to be in five minutes, two hours, or what. But the more I work with my intuition, the quicker it seems to come. And this is probably the quickest of all, literally five, ten minutes into it and it was there. It was just like “Tum!”

Other instances

The process of surrounding herself with the materials and beginning to work is one Lynn follows frequently to solve design and implementation projects. She expects that she will solve problems successfully in the short timeframe she consistently works in. Lynn explained it as trudging along a path and all of a sudden being on top of a mountain knowing what the solution is. She expanded:

And I don't use my reason. I'm using my reason on one level in looking at reading materials and looking at things but then when I know, it's a knowing, I just know what I'm supposed to do and it's a feeling as well. Then I'll go back and use my reason to figure out, "okay I know how it's gotta be" and I'll use it to support what I already knew, know—does that make sense?....It sounds corny but that always works for me.

Sometimes, Lynn has the feeling of operating on two levels at once—being “bi-level”—mechanically typing and at the same time, operating at a different level and feeling and knowing what to do. As an example, she described a situation where she was asked to develop a training program and was not sure that training alone was the solution to the problem. She believed a management issue was involved as well. Therefore she had conducted a needs analysis and was in the process of writing a report on the results. She commented:

I had interviewed at least 20-25 people and I was surrounded by tons of information. . . . I was originally going to sit down and wade through this data on the Wang and start narrowing it down. And all of a sudden again, I get this feeling, this anticipation, a feeling that says “just go with the flow.” And all of a sudden it came to me altogether that I don’t need to do any of this, that all I need to do is deal with the three major areas and that that’s the way I should present it. In essence, . . . I did what I tell my writing students not to do. I came up with my finished product in one fell swoop—knowing exactly how it should be all at once. I hardly changed it except for a few typos. And it worked.

She explained that when her sudden insight came, she didn’t intend to have a final product, but was just beginning to dwell on the data. She noted that in that situation, one part of her was mechanically starting to type, but another part of her was at a totally different level. She explained, “I feel like I’m split. That’s the only way I can put it. But I’m integrated at the same time . . . the mechanical part that is doing the typing, gathering the data is not at a lower level but a different level.

Lynn’s perspective

Lynn’s use of the process she uses to access intuition is growing. She explained:

I’m beginning to discover that [the process] works for me. That’s the only way I can put it. I’m beginning to discover that that works. The other thing is that I trust it’s going to happen. . . . Usually I’m in a time crunch. I don’t like to

procrastinate. It's just that we're doing so many things, and we're forced to deliver, and it's not like I'm putting off. It's just no time. So that when I finally approach [a problem], there is a close timeframe to when it's got to happen. I've learned that things begin to evolve more quickly when I'm totally trusting that it will and I have the expectation that it'll happen.

In the past, Lynn saw herself as “probably more scattered and not quite thinking about what was happening.” For her, intuition “just happened.” But she never really analyzed what was going on. Now, she says, “I'm doing more to analyze ‘Hey, every time I do this, it happens.’ I'll say that's probably only over the last couple of months—I'm beginning to analyze—Hey it's working, let's try it again.”

Lynn always pays attention to her intuition because, as she said, “It has never failed me. . . .I'll get a certain feeling and I learn to trust and I'm always right.” She could not recall a time when she had been wrong during the last “couple of years.” She indicated that the projects she had described to me were highly successful. She expanded:

I wouldn't do anything different. I might look back a year from now and say, “yes I would do something different” . . . I might discover other things that I might incorporate.

Lynn has been in situations where she's thought about problems before she's gone to bed and woken up with the answer, sometimes as she's waking. She accepts these intuitions as bases for action. She remarked:

I can ask a question of myself, especially a complex problem, and one I do not quite know how to solve it at all. It's just where do I go from here. I'll wake up in the morning and you know how that moment before you wake up, but you're really not dreaming anymore and it's there. And if I capture that idea . . . and if I follow that, I'm always right. The results are there. . . . If I've gone back and reasoned it out and changed and said, "Oh, well, that can't work," "How can I possibly approach that person?" or "How can I possibly do it this way?" and I'll start doubting what I came up with, but it never works that well. And I'll come back and say I should have done it the original way that I thought of it. So I stopped doing that. I stopped trying to reason it out. I just do it. I want the reasoning part of me to support that. But if it's a choice, I'll always follow my intuition and I'll always be right. I've learned that. I had to learn that.

Marty

Marty is a senior training manager with more than twenty years experience in the field. He works for a large federal agency where he plays a policy and oversight role, frequently reacting to other people's plans, proposals, and situations.

The problem

Marty's goal was improved organizational climate and effectiveness in his organization. The issue he was dealing with was how he, and his subordinate managers, would receive feedback from employees on issues surfaced through an employee survey. As he explained, "I initiated the effort in my own organization because I felt like there were some issues that were impeding the improved organizational performance." He noted that he had "arranged for an excellent facilitator and encouraged employees to participate—hoping to seize this opportunity."

To Marty this was a very important issue. He explained, "there were indications of low employee morale—work quality was not all I thought it should be, etc. Furthermore, since we offer organizational development services to others, we should 'model' the behavior we ask others to adopt and be open, work as a team, able to change, etc."

The situation

At the moment the intuition occurred, Marty was listening intently to the person presenting the proposal. His concern was not only to pick the right course of action, but to be supportive and understanding to the group of employees that presented the plan. Marty noted:

I had to make a decision in a meeting with an employee representative and the facilitator on how to proceed. The employee representative made a proposal which was totally unacceptable to me—I said so immediately.

The intuition

The intuition was the decision not to accept his employee suggestion for presenting the feedback, but to take another route. Marty's response was strong and immediate. He remarked:

When I heard it, I reacted very negatively. It was a very intuitive response. And later I had to think why. Later I can rationalize why it was for all these reasons. But my response at the time was totally critical. . . . Actually I find that intriguing when I do that. I have an initial reaction and I have to think about why I can always come up with totally valid reasons and very logical reasons, but the response is intensely intuitive and very accurate.

The process

Marty is not sure how he arrived at either the negative reaction or the alternative, but he explained, "I knew that I was right. Absolutely certain." He believes the two arrived sequentially and that "it was also very quick. This one won't work, let's do this."

At the time he was trying to understand the proposal. He remarked:

One thing I didn't want to do is turn off the group of employees. I wanted them to feel that I was supportive, listening and understanding and that I want this process to work. I want to improve organizational performance so there is something in it for me and I can't just turn people off There was a need to talk about how we proceed. And we weren't talking about the substantive issues at all. We were talking about procedure issue. What process we're going to use.

Although the group had reached agreement on the broad goals, Marty then had an instantaneous reaction towards the approach. He just "knew" that the suggestion wouldn't work and said, "No, this won't work."

Marty saw himself as being very actively engaged in this process. He noted that one of his strengths is that he can really listen and hear, and get behind the words. For him that's a sign of engagement.

Other instances

This situation is similar to others in which Marty reacts first and provides the reasons later. He noted a particular instance when asked, he gave his opinion on a process "They then said, why do you think that way? And it took us a ten-minute discussion to come up with the reasons why I felt that way."

In looking at this type of situation Marty speculated:

I think my hunches are based partly on my experience at that point. All of my life experience comes into play. But it wasn't something I was sitting on, and carefully looking at the alternatives and trying to kind of rationalize.

Marty's perspective

To Marty, his intuition is always there, and he does not have to "access" it. Whether he mulls problems alone or is in a group situation, he experiences an instantaneous knowing when the solutions are apparent. He explained:

I can have either a negative or positive response in an instant. Sometimes I will have to come up with an alternative. Then I'll have to let that one perk more. I've told people my cognitive style is mulling. Sometimes I'll mull on something for a day or two. But eventually it'll come to me. And again I trust it when I finally see the way it should play out. I trust it. . . . I just know it's going to take awhile And I think at some level I'm focusing on that almost constantly—[at a] subconscious level. That [the problem] is always there until it's resolved. I have clarity about the answer to the question.

Sometime in the past, he made a decision to act on the basis of his instinct and cannot remember a situation where the choices were not the appropriate ones. On the other hand, he noted that every time he didn't follow his instinct, he got into trouble.

Mike

Mike is a training manager in a consulting firm that specializes in disputes, resolution, litigation support, and technical and financial analysis. A consultant for 15 years and in training for seven of those years, he is responsible for the design and presentation of basic consulting skills and management skills for the various levels within the company. He is also very active in professional and community activities and the problem he focused on for this study involved his representing a group of his peers at a program planning meeting for a community activity.

The problem

As a representative of his subgroup, Mike had to choose which part of the program his peers would conduct. The program parts were: warm-up activities; basic skills presentation; break; an active competition to reinforce the skill learnings; and closing activities.

The situation

Mike had arrived in a rush and in fact had not been scheduled to attend the session. Almost immediately a representative of one of the groups present agreed to do the basic skills presentation. Mike felt he had to act very quickly to choose one of the remaining program areas to avoid being left with something he did not want to do or that he could not sell to his six peers who were not there (and did not expect the task).

While the facilitator described the program, Mike examined each of the planned program areas. He attempted to find a fit between a particular program area and his and his groups' interests and abilities. For each area, he asked, "Would it make sense? Would I feel comfortable?" Finally, his intuition came in the form of a question to himself: "How about a competition where people can demonstrate what they are learning?" He determined that the competition fit with the sort of thing he liked and that he could sell it to his group.

The intuition

The specific intuition came to Mike as a most fully-defined and designed solution, though he had never seen the technique used in this way (a relay race demonstration) and had little experience with it. It seemed to Mike that he saw a real picture—seeing the room where the presentation would occur, how the tables were arranged, and how the people were moving.

The process

Mike was not aware of taking an action to access his intuition. At the time the intuition occurred, Mike was sitting, reading an outline of activities in general terms, and listening to people discuss timing segments. The facilitator was asking who wanted to do which program segment. According to Mike he was:

. . . trying to think, because I had to represent my group. I've got seven other people relying on me, and we've got to have something that will work, be active, for whatever piece we do. And I'm suddenly going to people who don't know they are about to be assigned a task of any kind and I have to come back and say, "Hey I volunteered us for this task."

I recognize on doing this I'd better say "and here's how we're going to do it" with at least some general scope. And sitting [in the meeting] looking at [the choices], saying, "Alright, now which one of these things can we do?" I suddenly had a complete vision, missing real details, but I was able to see how we could do the intergroup competition to reinforce the skill learning. I saw the people going back and forth. So promptly I volunteered us for it, went back and sold my group on how the details of that would have to work.

Other instances

Mike believes he constantly uses an intuitive approach to problem solving. Referring to the Meyers-Briggs Type indicator, he noted, "I have no raw sensing. I don't think I have to go out of my way to access my intuition, I have to go out of my way to access anything else like looking for the facts."

In his role as a consultant, he is called on frequently to suggest how things can be improved and is constantly required to come up with suggestions of slightly better ways to do things. He is very aware of filtering these suggestions through an internal screen,

considering the feasibility or pitfalls of the ideas before he shares them. He notes that he consciously tries to speed up the time process “so the suggestion that comes out, comes out at the same timeframe but comes out with the additional review on it.” He expanded:

All I’m doing from the second it occurs to me immediately is trying to analyze it. To say, “Does that work? What are the major holes in it?” And then describe it, and describe the major holes if I’ve seen any. . . . I think it is the way my mind works. It automatically does those things, rather than say, “alright now think about it, concentrate on that.”

In solving problems, he sorts them into smaller parts. He then considers practical issues that impact the solution. In designing training programs, he reads and explores until he finds something that looks like it ought to work. He noted that there are times when he doesn’t have an answer, but “my solution is to read further, to look for other potential sources of ideas until I have an answer without struggling for it.”

Mike’s perspective

Although Mike can remember finding a solution later than “in the calendar schedule I had allotted it,” he could not recall a time when he couldn’t find a fit. He indicated that he always heeds intuition and that he “just always assumes the intuition is right.” He clarified:

The only thing that would reject an intuition was practical details, proof that I couldn’t do it, like it required the invention of a new anti-matter device. Or it would

cost too much money to do . . . and money is nothing but an implementation device. But I can never conceive of rejecting an intuition for any reason other than there was some constraint which made it impossible to do.

When asked if there had been times that he had acted on the basis of intuition and been wrong, Mike indicated that his experiments sometimes didn't "work as well as I would have liked them to. It doesn't mean they were wrong. . . I don't use intuition on things where there is a clear right and wrong answer because I don't deal with many things that have clear right and wrong answers."

Sharon

Sharon, a senior-level HRD manager in the government with more than 20 years experience in the field, views herself as an analytical thinker. Her roles have included instructional designer, project/program manager, and organizational consultant. She reported that it took her quite a long time to come up with a situation where she thought intuition might have come into play, and even then, she was not 100% sure of the fit.

The problem

Sharon described an instance where her problem was to help her supervisor find a way to deal with a difficult issue. Her boss was frustrated with a problem he was having in another part of the organization and mentioned this frustration to Sharon during a meeting discussing other issues. In describing her boss's problem in her journal, Sharon noted that

it's source was the Director's unhappiness at poor "housekeeping" in an old office building. The old building had "leaking air conditioner systems which were due to be replaced, broken wall areas due to be repaired by a fixed schedule of the Navy "landlord," delays in delivery of new furniture, etc." Sharon explained that these were problems beyond her boss's control, but the delays and inadequacies were making him look bad to the Director. Restating the problem Sharon indicated that her boss was being "held accountable for shortcomings which he couldn't control." She saw this as an extremely important problem for her boss since it was a "cause of a lot of negative feedback abrasively delivered, from his boss."

When asked, she stated that she was under "some pressure, totally self-imposed, to help him find a solution—because this situation was taking his time and energy away from more substantive issues." She also wanted her boss to see her as a source of good ideas beyond her specific responsibilities.

The situation

Sharon met with her boss. She explained:

We were talking. It probably was a situation in which we had already talked through my issues in a once a week meeting. And maybe in the course of doing that something had come up about the fourth floor where the Director, and Vice Director are and his frustration about their constant hammering and dissatisfaction with a lot of these issues which have nothing to do with me. But which are

constantly, which are so visible and obvious to everybody that they are constantly, you know, hitting you in the chin.

The intuition

Sharon wanted to be helpful. As she listened to her boss, it suddenly clicked that his problem involved managing public perceptions. She explained, “And so what I found myself saying was that you have to get out in front of the problem.” She continued. “This is just sort of an idea that I find I have used in situations and I often don’t know what that means. But you’ve got to get out in front of the problem and I have sort of this almost visual feeling of getting out in front of it.” In her journal she noted that the intuition was primarily visual or perhaps kinesthetic—the idea or feeling of “getting out in front of the problem.” That means demonstrating that you are in control (if possible) in some fashion.

Sharon and her boss then worked through what getting out in front of the problem meant in this situation:

What we talked about was for him to tell them when a problem was going to be coming along. When they hadn’t seen it yet or they hadn’t observed it yet [for example] at such and such time we’re going to have to close down the air conditioning system in order to repair this or that or put a new door in. Tell them in advance, tell them exactly—how long it’s going to take, what the options are, what some of the problems might be, fill them in in advance so that they don’t discover things and then blame him.

She noted that, “We’ve had over the course of time conversations that he seems to enjoy and get a lot out of which were not in my territory but in which we were talking about organizational situations So in this situation it just came to me that. ...I guess it was also from a perception that that was not a natural thing that was happening with him or with the person who was my peer that is suppose to be handling these things but they don’t seem to have that sensitivity to the need to get out into the front to manage the public perception in advance. They solve their problems just fine and they arrange for the xxxx to do this and have to wait for so long, but they’re not out there making sure that people understand what they are trying to do for us.”

The process

Sharon suggested to her boss that she use a strategy she has found increasingly useful for dealing with similar problems: “getting out in front of it.” She then started brainstorming with him to help him think of possibilities to “get out in front of the problem.” Sharon did not have a precise process in mind for this strategy and would, for example, ask others to help identify ways to get in front of a problem. She described it as planning for it, announcing what’s going to be happening, planning for the impact, identifying points of contact, and managing the problem rather than letting it happen. She had an “almost visual feeling” of getting out in front of it.

While she recognized taking no conscious action that enabled her to decide her boss needed to “get out in front of the problem,” Sharon’s comments in the journal and interview provide additional background on the events that occurred.

Just before the intuition happened Sharon was listening to her boss describe his frustration- “One _ _ _ _ thing after another”—with a good reason for each, but no opportunity (he felt) to explain situations to his boss. She noted that she was “recognizing that these irritations were preoccupying him and his boss to the exclusion of other more meaningful issues they should be dealing with.”

To Sharon the intuition was very clear. Her reaction was relief—“a way to cope with the helpless feelings of my boss.” She described it as —“more of a feeling, a sudden ‘light at the end of the tunnel,’ suddenly seeing a path for positive action of some sort.”

She remembers taking no conscious action to search for a strategy: “just the light dawning of providing him some cues and directions to move.” Moreover, while no specific action triggered the intuitions, she guessed “that a compelling factor was probably his saying just how frustrating it was And they don’t seem to have the bigger picture.”

Thus, Sharon started coming up with possible ways to develop a bigger picture. She noted, “I was trying to brainstorm with him in a way that would give him some ridiculous possibilities as a way to help free him to think. . . .I said let’s get out in front of it. What does that mean? And something about the sticker. I thought what if you had

orange stickers you paste on the thing—we're going to get to this. If it's a broken window you say yes, we know about it, and we're going to fix it by such and such date.

Other instances

The other instances in which Sharon sees intuition coming into play are organizing and restructuring issues and in "Solomon" type decisions of staffing. To build an organizational plan, she indicated she might have a gut feeling about a plan and then look at the facts to see if they justify it. She would decide to implement an organization plan "when everybody liked it, when it seems to fit, and when it seems to cover the important things without big gaps someplace." As a basis for making staffing decisions, Sharon relies on her experience and whether or not candidates are "tuned into her wave length."

Sharon's perspective

Sharon repeatedly stated that she did not use intuition or that if she did, she was not conscious of it. She said. "Either I'm not using intuition at all or I don't know when I am. It's not obvious to me."

At the same time she sees herself more frequently using the concept of getting out in front of the problem. She said:

It's a kind of thing that I have come to. I can't say when. It's something that I turned to when faced with something with potential for a lot of aggravation. We

have to figure out what the idea of getting out in front of the problem means in this situation.

It doesn't do that much for you in a problem where there's a single problem and a way to fix it. It's a thing that you do when there's going to be something ongoing that's going to impact on a lot of other people. You want to manage their support—it's [useful] when there's a public perception problem. If I broke my ankle and I want to get to the hospital I wouldn't use getting out in front of the problem. It's for a problem that deals with public image or perception that becomes a major part of what has to be managed.

Thus, concluded Sharon, one of the first thing you have to decide is when that (getting out in front of the problem) fits, when you use it, and when you don't.

Susan

Susan is a mid-level government training manager. She has responsibility and supervision for a variety of technical and professional development programs for a highly technical staff; at any given time, five to seven people report to her.

The problem

As Susan began working in the agency, she became involved in an effort to improve the morale of her organization and thus to improve productivity. In a structured

meeting which she attended, and in the written report of the session, her co-workers identified problems they were facing and barriers they found to getting the job done. To Susan, the data gathered indicated that:

Overall, these individuals feel powerless within this organization. There seems to be evident in a number of the staff members the sense of being a victim of the organization. . . . As a result, there is evidence of stress-related illness (examples: ulcers, high absenteeism for sickness, etc.) and an overall lack of zest for coming to work, meeting work deadlines, etc.

Susan pondered this information over a period of months, speaking to people as well. She began thinking, "How can I solve this problem?" She said:

People were really feeling resentful; it was a difficult situation. So being here and knowing I had to get my work done, I said, "there's got to be something that we can do to have people feel better about who they are, kind of rise above those powerlessness situations." And I guess I started thinking that I wanted to do something to solve that problem.

Thus, Susan's problem, as she saw it, was to develop and encourage positive affirmation within the staff. She needed to come up with a plan for improving morale. As a new employee and because the situation, by its nature, involved her supervisor as well as peers and persons who reported to her, she approached the solution with caution.

The situation

Over a period of months, Susan had in mind a picture of people confident in their own vision who experienced a “happy, productive work environment.” To help her reach that end result, Susan called in an outside consultant to help come up with a plan to improve morale. During a two-hour meeting, she and the consultant discussed the problem and “brainstormed” alternatives, weighing pros and cons, bouncing things back and forth, and challenging each other to refine the situations.

Finally, the consultant “came back” with a statement that pulled together a couple of different ideas. At the moment the consultant voiced the idea, Susan was sitting, thinking, listening, and letting her own ideas and those of the consultant “settle in.” And, at that moment, Susan knew that the idea was absolutely an acceptable solution that she could sell to management.

The intuition

As stated above, the intuition was a plan to improve morale—a developmental program to place over a period of time. Susan sees it as one that will fit the organization, and the plan has been accepted.

The process

In her journal, Susan listed the actions she took just before the overall problem solution occurred. They were:

- Discussion with another HRD professional
- Weighing the pros and cons of each solution
- Brainstorming
- Inductive reasoning
- Visioning what the end result should be
- Testing many alternatives against [her] perception of the problem
- Listening
- Synthesizing ideas (the best of all ideas)

In her interview, she noted that before this meeting she had thought through the problem over a period of months. She explained:

“I had to think of ways that I could politically get acceptance for what I ultimately would want to do, whatever that was, without causing the staff problems. . . . I strategized a lot in my own mind; I thought things through, I did quite a bit of observing and talking to people and just collecting data, I guess, personally, internally. . . . So I did a lot of refining of that information, talking, trying to figure out what was going on. Then I reached a point where I needed someone else to

come in and talk with me about [it], . . . an HRD professional, to discuss the issue, the problem.”

Susan described her meeting with the external consultant. She pictured the session as highly interactive. She explained:

I can't work well if I limit myself and my thought process. So I had to open it wide open. We were generating a lot of ideas, a lot of feelings, and a lot of discussion. The whole time I was sitting there, listening, throwing out my ideas, weighing the pros and cons of what comes back. We bounce things back and forth, challenging each other to refine the situation. I got to a point then where we had a lot of data. I sat back and listened and let it settle in [to] more of my intuitive nature . . . to make some sense of all this information that we had gathered. The person I was talking with came back with something that pulled together a couple of different strings. At that point, it was like, “This is it.”

I knew it, I felt comfortable. It was if I had a period of excitement in the generation of the ideas and playing back and forth [at the moment of solution], I felt almost a sense of relaxation. From everything I know of the situation, I knew this was absolutely an acceptable solution. It was almost like that flash of light and then a sense of excitement and kind of a “whew” sense of relaxation. It was very [energizing]. I was just very high and going on adrenalin [while generating ideas] and then, [when the intuition occurred], it was like “ahhh.” I was exhausted for the rest of the afternoon. It was very draining.

Expanding on the moment of solution, Susan noted:

I was very high from the whole thought process and the energy of it and then [the consultant] said it back to me and it just . . . clicked. I felt immediate acceptance and then “ahhh.” Like coming down on a cloud.

In her journal she noted, “I shut my mouth (stopped talking) and allowed the thoughts/ideas we had discussed settle (a couple of minutes).”

When probed, she reinforced that comment, chuckling:

I can't talk and think at the same time and when I'm really rolling on something. I can generate a lot of ideas, but I'm not really thinking and synthesizing. . . . I'm throwing them out, I'm getting them all out from inside of me, dumping whatever I have to dump out, but I'm not really synthesizing my thoughts. I'm not getting them together. It helps me to have someone else come back to me with what I've said and paraphrase back to me, because then I can sit and actually listen.

Other instances

According to Susan, the process described above is typical of the way she works. “I work best if, in fact, I generate all the particular alternatives, just put the information out

on the paper and then go back and make sense of it, synthesize, hone it down. It may change complexity in that process.”

Susan's perspective

While Susan was unclear about whether she intentionally separated idea generation from analysis, she was aware that she routinely did so. She said:

I just do, a habit. . . . I make myself sit back and think about it. So that is a conscious type of thing that I do. To sit back, OK, I've said a lot of things. Well, what have I really said? And make some sense . . . As I said, I just get on a high and it all comes out and then I sit back and reflect.

She sees herself as relying on and heeding her intuition.

I'm very lucky in that because I'm taking in and observing a lot of things. Normally, when my intuition tells me something, it's not based on something suddenly happening, and I'm just reacting. It's a lot of other things going on in my brain that I've been observing and reacting to and thinking about and I can just go with it.

Susan had difficulty thinking of a situation where she wouldn't rely on her intuition:

If it were a situation that maybe I might be new to, brand new to, unless it was something I could base my reaction on my past experience, maybe. If it was something similar to some other situation, but if it was something I was totally unfamiliar with, it was something where I feared for my life, I don't know. My intuition would probably suggest something opposite of what you're supposed to do, I don't know.

Remembering only one significant incident where she had relied on intuition to select an employee and been proven wrong, she noted, "I dealt with a lot of anger as a result of it, but it never kept me from relying on my intuition the next time. But I might be more cautious."

She explained:

I usually operate on a high level of trust unless people prove it otherwise, and so sometimes I might tend to be taken in by an individual one-on-one type of relationship as a person who comes across as being sincere and trustworthy and my other emotions might take over, my more people-oriented emotions, and I might let them cloud my common sense, so to speak.

She found the process of participating in the study helpful:

It made me more aware of the whole notion of what I was doing and the fact that it's worked well for me. . . . I've had great success with using this, and I would

probably continue that kind of process with maybe, you said something about listening, probably improving my listening skills; allowing more time to actually listen to what the other person is saying and listen to what I am saying more so.

Conclusion

Thus, each of the participants tells a slightly different story. Participants write and speak eloquently about their experience accessing intuition. Their reports evidence the human ability, not only to act, but to reflect on those actions. Each participant was able to identify a problem, establish a point of time as the moment of solution, describe an intuition and note his or her actions. Participants' ability to distance themselves enough to record their mental actions to access intuition at least to some degree, is an important factor. This type of reflection helps people recognize that access to intuitions need not be a mystic journey. Moreover, the process of reflection in itself help individuals to learn more about accessing intuition.

Through the vignettes included here, a reader can sense the context of each case. Also accessible are connections between problems, intuitions and actions which will be mentioned or alluded to in Chapter 5's Analysis of the Findings. This Chapter has presented findings from individuals' separate vantage points. On the other hand, Chapter 5, which follows, reports results from the journals and interviews in a more integrated fashion. It analyzes data across cases and across data categories. Subsequently, Chapter 6 summarizes the report and suggests implications.

CHAPTER 5: FINDINGS—ANALYSIS OF JOURNALS AND INTERVIEWS

Introduction

Chapter 5 includes a comparison of individual experiences presented in the journals (Part 1), an examination and analysis of participants' comments in both the journals and interviews (Part 2), and a discussion of the dynamics of accessing intuition in the problem-solving process (Part 3). In Part 1, the journal analysis, data from individuals were compared to derive similarities in the experiences people recorded. This comparative analysis focuses on the journal entries alone and uses the journal questions as guidelines to establish the elements discussed. In Part 2, the qualitative content analysis looks in detail at the data in both the journals and interviews. Part 3 discusses the dynamics of accessing intuition in the problem-solving process based on an analysis of the interrelationships among identified elements and categories.

Part 1: Individual Experiences from Participant Journals

Drawing its structure from the participants' journals, which serve as the basis for the analysis, this part of the report is divided into three sections: the first examines the problems participants chose; the second examines the intuitions they experienced; and the third analyzes the actions they took during or immediately before the moment of solution.

The data analyzed here were derived from participants' journal comments. Those comments were closely examined, and the information in them was classified into a total of 18 elements. Tables 9, 10, and 11 show the elements and key information for each. All but 4 of these elements can be directly tied to the questions included in the participants'

journals (see Table 9). For example, the information displayed in the row labeled “Problem Complexity” in Table 9 is based on the journal question which asked: “Was the problem simple or complex? Were there multiple answers? One ‘right approach’?” Consequently, the data in 14 elements represent either a direct quote or a simple rephrasing of participants’ responses.

The situation is somewhat different for the other 4 elements. Comments about the “Problem” in Table 9, the “Intuition” in Table 10, and the “Specific actions at the moment of or just before solution” in Table 11 resulted from summarizing and/or classifying narrative descriptions included in the journals. In this case, participants’ responses are quoted directly or paraphrased. In Table 10, the last element, “Alone or with others,” addresses a factor of the setting in which the intuitions occurred which seemed noteworthy because the results (i.e., a high percentage of people indicated they were not alone) were unexpected. I had not considered this factor when I developed questions to guide the participants. Thus, this element occurred spontaneously from participants’ statements.

The problems chosen

Problem subject matter and type

The problems participants chose to describe ran the gamut from game design to human resource planning. Based on a cursory review of the column labeled “Subject matter” in Table 9, one might be led to believe that the participants addressed very

Table 9

Problem and Related Characteristics (from Participant Journals)

Elements	"Bill"	"Dana"	"Doug"	"Glenn"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Problem	Persuade a group to adopt executive recruiting plan; resource planning	Choose topics for editorials; editorial planning	Design a recruitment ad	Create a new approach for human resources utilization, planning, training, etc.	Develop plan to persuade boss to hire people	Create game scoring scheme	Develop training design with public relations component	Approve/determine plan for feedback	Design activity that group would buy	Help boss plan approach to manage perception problems	Develop plan to improve morale effectiveness
Subject Matter	Resource planning; executive selection and assignment	Editorial planning	Designing ad theme	Multiple HRD issues: selection, training, job design, etc.	Hiring; resource planning	Game design	Program design; public relations	Organizational effectiveness	Program design with communications dynamics	Perception of boss' supervisor	Program design; organizational effectiveness
Problem Complexity	Highly complex; multiple answers	Complex; multiple answers	Reasonably complex; infinite number of themes	Complex; systemwide	Complex; multiple answers	Complex; multiple answers	Complex; multiple answers	Complex; multiple answers	Somewhat complex; multiple answers	Complex; multiple answers	Complex; multiple answers
Problem Importance	Extremely important	Extremely important	Moderately important	Extremely important; very expensive in both direct & indirect costs	Extremely important	Very important	Extremely important	Very important	Moderately important	Very important for boss	Very important
Under pressure to solve?	Yes. Needed results within next 60 days.	Yes. Time	No. Time pressure was not really a factor	Yes. Pressure to produce better staff	Yes. Self-imposed	No.	Yes. Time	Yes. Some	Yes. Time, no warning	Yes. Self-imposed	No.
Risk	High risk in solution; great risk with no change (for organization)	High in the beginning (for organization)	Some risk (for organization) little for self	Some risk (for organization)	Some risk (for self)	Moderately high risk (for relationship)	Great risk (for self, department)	Moderately high risk (? for organization)	Not much risk	Solution less risk than high risk problem (for boss)	Great risk (for self)

Table 10

Intuition and Related Characteristics (from Participant Journals)

Elements	"Bill"	"Dana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Jym"	"Marty"	"Mike"	"Sharon"	"Susan"
Intuition	Executives would accept plan	Elements fell into pattern; topic almost apparent	Phrase—"Span the spectrum"	Redesign job, selection, recruitment, training, etc.	Understood way to proceed	Scoring scheme	Thoughts about training design	Rejection of one approach; immediate generation of other	Activity design	Intuition was "to get out in front of the problem"	Plan to present to improve organization's climate
Mode	Auditory and visual	Symbolic and visual	Inner dialog of symbolic expressions	Auditory	A faint idea	Auditory	Altogether; dialog after	Knew it; perhaps felt it; dialog after	Visual	Visual; kinesthetic	Visual; kinesthetic; inner dialog
Type of Experience	Quick experience. Required one or two iterations over 30-60 seconds.	Quick flash. The intuition came in a quick flash of understanding. Knowledge of how the story line would go.	Clear, quick flash. The idea to list "the spectrum" on my list of images was a clear, quick flash.	When the intuition occurred, it was a very clear one. It felt like I'd formed a new statement.	Fairly clear. I had some worry about it; suddenly realized that I had to see him personally.	Quick flash and vivid. I was impressed how sharp and clear it was.	Quick flash. I just knew instantly.	Quick flash. Again, I "knew" it. No doubt.	Very clear. Very clear images, though fog drifts in as I define details.	Very clear. It was very clear—"Aha!"—that's the way to go!	Quick flash. It happened, it happened, it happened. You quickly flash of intuition was vivid.
Initial Reaction	Meets all requirements for gaining commitment without threatening	Relief; joy	Reserved judgment	Certainty	Relief	Relief and joy	Certainty	Certainty	Relief; joy; certitude	Relief	A feeling like picking up a puzzle piece, or solving an Agatha Christie or Conan Doyle mystery.
Analysis Performed	Yes. Before and after intuition	No. Details to be worked out	Analyzed throughout; tested	Gathered data, examples	Gathering information	No.	No. Thought about it in over-knowledge; knew it was right; it made the difference (after I achieved results).	Thought about it to understand	Analysis for implementation	I felt a sense of recognition. "Oh, yes! That's what we can do!"	Yes. Refining solution
Did Intuition Retain? Did you expand?	Expanded on	Not answered	Yes. Reflected	Expanded on	Yes. Thinking about details	Yes.	No return	Stayed	Not answered	Intuition had appeared before	Returns
Signal	Yes. Feeling of confidence facing the problem, even though no "real" solution was apparent.	No	No	Yes. Feeling of waiting, anticipation.	No	No	No. Not at or before the exact moment—but I did have heightened emotion.	No	No. Not that I'm aware of. It was just there.	No. No signal, but this thought probably recurring more frequently as I find it helps.	Yes. I had a gut feeling that we were really close to what I had initially envisioned.
Alone or with others	With others; group setting	Alone	Alone	With others; group setting in a meeting	Alone	With one other; with husband	Alone	With others; during meeting; during proposal	With others; in midst of group	With others; with boss	With one other; with consultant

Table 11

Actions During or Just Before the Moment of Solution (From Participant Journals)

Actions	"Bill"	"Deana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"	
Actions at the time of and immediately before the intuition occurred.	Listening	Thinking, day-dreaming	Brainstorming	Working in a group	Listening, Driving home, listening to a John Denver tape.	Talking, Just talking about how complex the game would be unless we had an overarching framework.	Reading	Listening	Sitting, reading; listening	Listening, Just listening to my boss describe his frustration.	Thinking; listening	
The specific moment of the intuition or just before solutions.	Observing—meeting on the general subject. Begin chartered by a peer.	Something was said to work. Intuition came about while doing something not related to work. Consulting a colleague and two acquaintances that resulted in a lot of intuitions.	Brainstorming. At the time I hit on the theme for the ad. I was sitting in my office in a fairly long brainstorming session, writing words/ phrases on a notepad.	Listening. Listening to the representatives of the problem components describe the problem from their points of view.	Driving. I was driving home from work. I had written out the scenario, what I was and decided to do, but wasn't right, but sleep on it. Then driving home, it came to fall into place.	Idea generating. We began to discuss a number of moves that made the game possible. We also came up with a scheme for a playing board and cards.	Increased. Strounded with course materials, I decided to do a project. I had a great idea, but I was nervous about it. I was nervous about it.	Listening to proposal	Sitting, reading; listening. Sitting in a meeting, at which I had arrived in a rush. Barely caught breath and got focus of the meeting.	No comments	Yes. I was putting some energy into helping him find a way to cope, not actively engaged in solving the problem myself.	Yes. I was listening to the boss's frustration. I was listening to the boss's frustration. I was listening to the boss's frustration.
Action engaged in solving the problem.	Yes. Yes in a general sense. I was addressing performance problems.	No. Intuitions seem to come when I've left the problem alone for a while.	Yes. I was actively working on the problem.	Yes.	Yes. I was mulling it over—sort of "wallowing" in it.	Yes. I was playing with the idea frankly. I wasn't grasping my teeth.	Yes. In a very small way, I was beginning the journey without a map not knowing how to proceed. Things hadn't come together yet.	Yes. Yes, I was listening to try to understand the problem/solution as seen by employees.	Yes. Was examining segments (mentally) to see which one I should commit my group to.	Yes. I was putting some energy into helping him find a way to cope, not actively engaged in solving the problem myself.	Yes. Yes. I was leading the process.	
Intentionally take some action to access intuitions? What?	No. No. This is a fairly routine mode for me.	Yes—gets rid of distractions. I was in a state of consciousness. I think that I access my intuition very often. I was in the door for an hour and try to put myself in a state of consciousness. I was in a state of consciousness. I was in a state of consciousness.	Yes. At first, I was in a state of consciousness. I was in a state of consciousness. I was in a state of consciousness.	Sa very still. Fit it come together.	No.	No. No—except I am conscious that I let my mind wander and I usually try to think of the whole problem and not pieces.	Yes. I just started expecting that sooner or later intuition would kick in.	I think it's a little bit there—I don't have to "access" it.	No.	No.	That my mouth stopped talking and allowed the thoughts that we had discussed settle. (a couple of minutes)	

dissimilar issues. However, a closer review highlights some striking similarities in the types of problems chosen.

The problems were to:

- Persuade group to adopt executive recruiting plan; resource planning (Bill)
- Choose topics for editorials; editorial planning (Dana)
- Design a recruitment ad (Don)
- Create new approach for human resources utilization: planning, etc. (Ginny)
- Develop plan to persuade boss to hire people (Jan)
- Create game scoring scheme (Jeanne)
- Develop training design with public relations component (Lynn)
- Approve /determine plan for feedback (Marty)
- Design activity that group would buy (Mike)
- Help boss plan approach to manage perception problems (Sharon)
- Develop plan to improve morale/effectiveness (Susan)

Of the 11 problems, 9 clearly dealt with persuading or convincing someone of something: a position in an editorial or one in a company; participation in a group activity or the way to manage the perceptions of others; the adoption of a plan to improve morale or organizational effectiveness or a way to provide feedback on those issues; hiring people or learning new ways to service clients. The other two, a system-wide approach to human resource utilization, job assignment, and training etc.; and creating the scoring system of a game, might be thought of as global design issues. In fact, looking at the set of 11 problems another way, we find that 10 of the 11 could be called planning or design projects

with the eleventh being the approval (or rejection) of a design. Thus, the problems when looked at in context, although differing in subject matter, share similarities in one major element—their purpose—persuading, training, or convincing others and/or in their central task of planning or design. In many cases, both conditions occur. This commonality may exist because of the nature of the samples. Human resource development manager's jobs require them to plan and design and to persuade or convince people. However, Agor (1986) and Isenberg (1984) suggested that senior managers in a variety of fields access intuitions to solve similar types of problems.

As Table 9 indicates, the problems chosen were also similar in nature or complexity and in their level of importance to the participant and/or to others. In most cases, participants felt some pressure to solve the problem. The data on the amount of risk participants associated with the problem or its solution were more variable.

Problem complexity

Most of the participants believed their problems to be complex: nine stated that the problems were complex, highly complex, or greatly complex. Don said his was reasonably complex, noting:

While I deal with many issues that would be considered larger and more important in the course of my job, I would consider the writing of a major new recruitment ad reasonably complex. It certainly is a reasonably time-consuming process. Much of the complexity is introduced because of the essentially creative/intuitive nature of the process.

Mike reported that the situation he chose was “more complex than simple, but not completely convoluted. Almost an infinite number of possible answers, none essentially more ‘right’ than others.”

In general, participants saw that their problems had multiple answers. In fact, Dana indicated that, “there were many answers, none of them so right they would preclude others.” Don pointed out that an “infinite” number of themes could be created for his ad and that, “If you asked 20 ad writers to create an ad, you would likely get 20 different themes. There is no one right ad.” Mike’s comment encompassed both of these points. Lynn stated that she didn’t know if there was one “right” approach but that “I . . . do know this one worked.”

Problem importance

Most participants saw their problem as very or extremely important to themselves, to someone else, or to their organization. Dana explained that delivering a “good ” column on time was extremely important to the magazine she worked for and its publisher, and that the approval process involved the highest ranking official in the organization. In documenting his successful attempt to have his company’s top executives adopt a new recruiting plan, Bill noted, “People are the determinants of success in a professional services business.” Marty and Susan were dealing with issues of poor performance and low morale. As Susan confided, in her situation, “The lack of a positive personal vision was blocking the staff’s ability to think creatively, to generate quality work, to be happy within their work environments. Sickness (physical illness) was causing extensive use of

sick leave.” Ginny was facing a system-wide issue which had continued for a long time and which she saw as expensive in both direct and indirect costs. In a similar vein, Lynn saw an opportunity to help “refocus the entire company, create a new improved vision, and contribute mightily to the bottom line.” Coming closer to home, Sharon saw an opportunity to help her boss find a way to avoid negative feedback abrasively delivered from his boss, and Jan dealt with a headcount situation for which she had been seeking resolution for two years and in which she had, “. . . almost pushed the vice president as hard as I should.” Finally, Jeanne, who addressed a scoring scheme for the game her husband had worked on for ten years, reported that her husband wanted closure on this “lifetime project” so that he could market it.

In contrast, Don and Mike saw the problems they chose as only moderately important. Mike noted that he and his group would look weak if the solution didn’t work, but that there would be minimal long-range consequences. Don explained his view this way:

The success of the ad is moderately to mildly important to me and to the company. We do need to fill the open positions. We will invest \$5000 to \$10,000 in placing the ad in different publications, and we would certainly like to think that the money will yield a good return on the investment. However, other issues I deal with are certainly more important for the organization.

I found the high degree of perceived importance particularly interesting especially because I inserted the question based on personal experience. I believe I access intuition in situations important to me. In other circumstances, I don’t choose to and/or may not be

attentive enough to accidentally intuit. However, the mere presence of this factor is not enough to make a definitive conclusion about the meaning of problem importance and its relationship to intuition. For example, the high degree of problem importance identified here may not be a causal factor in someone's choice or habit in accessing intuition. It might be related to participants' propensity to remember the situation!

Issues of pressure and risk

Participants addressed whether or not they were under pressure to solve the problem because of time or any other factor. They also provided information on the amount of risk perceived for themselves, their organization, or others. These questions were included in participants' guidelines because Goldberg (1983), Agor (1986), and others suggest that pressure, particularly time-related pressure, might have some relationship to people's tendency to access intuition in problem solving. Additionally, Palmer (1988) suggests that problems with greater perceived risk might evoke the use of intuition. While participants' comments on pressure and risk have been included in the findings, these results do not seem compelling. The issue of time was specifically queried, perhaps highlighting time over other factors as pressure. Participants also addressed the questions differently. For example, some report the risk to themselves, others the impact on their organization. Some risk the problem or solution risk; others the danger of the status quo.

Answering the question, "Were you under pressure to make a decision or come up with an answer because of time or any other factor?," 8 of the 11 participants said "yes." Two of these pointed out that the pressure was self-imposed; Jan pointed out that she didn't

know how long she would be able to hold onto the two people she wished to hire and that they were critical to the work; Sharon stated she was under pressure to help her boss find a solution, “because this situation was taking his time and energy away from more substantive issues,” and “I want him to see me as a source of good ideas beyond my specific responsibilities.” Interestingly, while Don specifically noted that time was not a pressure, and Ginny indicated that the pressure she felt was to produce a better staff, 7 of the 8 participants who felt under pressure did associate it with time. As noted, Jan did not want people to leave as they might without resolving their status, and Sharon wanted to refocus her boss’s time and energy. Dana was consistently under a tight schedule, Bill needed a new recruiting system within 60 days, and Lynn had to deliver the program she was designing that evening. Both Marty and Mike were required to make immediate decisions, and Mike noted that he had to act with almost no warning. However, as mentioned above, despite participants’ seeming congruence in mentioning time pressures, the wording of the question may have skewed their comments.

In contrast to their decided propensity to report time as a pressure, participants reacted diversely when reflecting on the issue of risk to them, others, and/or their organization. Four saw not much or some risk, two indicated that the risk was moderately high, and two others felt that it was great. Finally, two participants indicated that while the problem had risk associated with it, the solution did not. As Bill noted, “There was great risk without a change in approach. Solution wasn’t risky, just more of an immediate burden to produce a long term result.” Sharon pointed out that “the problem was a high-risk to my boss; any solution would probably be less risk—though some solutions might be more risky than others.” In Sharon’s case, she viewed the risk in terms of her boss. Marty and Mike did not specify who was at risk. Bill, Dana, and Ginny examined it from

an organizational perspective, Jan and Susan considered risk from a personal perspective, and in terms of their relationships with supervisors, Don and Lynn assessed it from both a personal and organizational/departmental vantage point. Jeanne, who was addressing her husband's problem, saw it in terms of that personal relationship. Because of the diversity in the way participants viewed this issue, little can be concluded about the relationship of risk to accessing intuition based on their responses.

Problems ill-structured

Taken as a group, the problems participants chose are the type of complex, ill-structured problems that many researchers (Agor, 1986; Silverman, 1985; and Isenberg, 1984) claim are fertile fields for solvers to access intuition in solving. The problems were complex, involved multiple variables, had no single answers, and involved whole systems or multiple relationships. Also, in this case, perhaps because of the nature of participants' jobs, the problems involved persuading or convincing people or designing learning activities. That participants chose to report on ill-structured problems may not be highly significant. After all, based on earlier research, I suggested that participants pick such problems in an effort to identify situations where they would be most likely to access intuition. Indeed, I discussed many of the parameters of ill-structured problems with participants as we considered suitable problems, although I did not suggest a focus on situations of persuasion or learning. What may be relevant, however, is that although some participants reported difficulties, all were able to identify such a problem and to link it with their use of intuition.

Intuitions experienced

Not only were participants able to identify suitable problems for the study, they were also able, with varying degrees of difficulty, to describe the intuitions they experienced. They were asked to do so to provide a backdrop or context of their situations in order to make possible a fuller, richer understanding of their intentional or accidental actions at or just before the moment a solution to their problem became apparent.

Table 10 shows participants' reflections on this moment in time, which is referred to as "the moment of solution." The data capture participants' response to the general instruction, "Describe the intuition you experienced," as well as to the specific questions that followed. They also include participants' comments on whether or not each experienced a signal that the intuition would occur. This was asked in the next set of specific questions in the participants' booklet. Further, it includes the table information on who was with participants at the moment of solution, a point which I had not included to focus on in the study, but one which seemed to have meaning as the data were analyzed.

The specific intuitions

Summary statements of participants' descriptions of the intuitions experienced are displayed in the column labeled "Intuition," Table 10. The specific intuitions were, of course, driven by the particular problems participants were solving. Yet, as a group these intuitions share some interesting characteristics.

As might be expected from the nature of the problems, largely planning and design tasks, a number of the intuitions involved plans or designs. For example, Mike's and Lynn's intuitions were the designs of specific learning activities. Mike noted that the "specific intuition emerged as an almost fully defined and designed solution, though I have no memory of seeing the technique (a relay race demonstration) used in this skill set and little experience with it at all." Lynn described hers as a "strong thought that zipped into my mind from nowhere." She reported that she knew she needed to stop reading and listen to a videotape. Then when she heard the author state the same thoughts that she was currently pondering, she knew instantly her program design would succeed. Both Susan and Marty were addressing issues of organizational climate or morale. Susan described reaching a solution—a plan to improve morale—after an intense and lengthy discussion with a consultant. Marty's intuition was the rejection of such a plan and the immediate generation of an alternative approach.

One way to think of the intuitions described by Mike, Lynn, Susan, and Marty is that they are primarily solutions for or outputs of planning. Moreover, they seem to be the result of attempts to resolve what James Greeno (1978) calls *transformation* problems in which people seek ways to move from a present state to a desired end state.

The intuitions described by Don, Dana, and Jeanne seem similar to those of Mike, Lynn, Susan, and Marty. They appear to be solutions. However, these intuitions seem to be responses to a different type of problem, labeled as *inducing structure* problems by Greeno (1978). In inducing structures, people seek to create a structure in a chaotic situation. Dana selected a topic from a maelstrom of choices, Don structured his ad and Jeanne built a system to score a game. The language Don and Dana use to describe this

process is interesting; it suggests that the intuition was separate, had a life of its own, so to speak. Don mentions brainstorming until he “hits” on an image. Dana describes the situation thus:

The moment of intuition—when I saw the solution—was very much like the moment of deciding to press the shutter on a camera. The moments before and after the photograph might be equally true, but my intuition selected a particular one to capture. It was as if the confusion of elements in my head suddenly fell into a pattern that matched the template I had for what a good editorial should be.

The remaining four intuitions differ from the transformation and inducing structure solutions described above. In Ginny’s case, the intuition was a recognition of the magnitude and nature of the problem. In describing the intuition she said, “We were hiring the wrong people for the wrong job! We must select different people, train them differently, reward them differently, manage them differently for the new job.” For Bill, on the other hand, the intuition was both a solution to a pressing problem and the conviction that the executives of his company would accept that solution if proffered correctly. Don knew he had to approach them just right—that approach was part of the intuition. He noted that “all 12 executives were feeling great pain and pressure at the ‘moment of intuition’ and would be receptive to any demonstrably viable approach.” He explained that the results of informal discussion showed that groups of three assessors did much better than the single assessor in his company, and that the technology of targeted selection had been demonstrated. Thus, the solution to the executives’ receptivity was for Bill to “pair pain with opportunity; point out that the solution capitalized on their demonstrable strengths as a team; reveal that studies had already proven effectiveness; and

don't oversell; method greatly reduces, but doesn't eliminate poor selections." As recorded, Bill's intuition not only captured the thought of a new system of executive selection, and the conviction that this was the moment to suggest that system, it also included a plan or approach that Bill could use to convince the executives to adopt this new system.

This element of recognizing an approach or understanding a way to proceed seems the primary element in both Jan's and Sharon's intuitions. Jan broke her intuition into two segments: First, "it's obvious the headcount issue/decision doesn't reside with him, and I don't know how far he's willing to or can go to resolve it." Second, "I need to let him know my position to greater depth and at a more personal level than a voice message will allow." In Sharon's case, the intuition was to use a particular strategy to solve the problem. She describes it as the idea or feeling "of getting out in front of the problem. That means demonstrating that you are in control (if possible) in some fashion."

Mode of experience

While participants reported experiencing intuitions in a number of different sensory or perceptual modes, many also reported experiencing more than one type of perception. Participants were asked whether the intuition was auditory, visual, kinesthetic, symbolic, just a faint idea, an inner dialog, or in some other form. Of the 11 participants, 5 indicated that the intuition had been visual; 3 noted an auditory experience, and 3 also reported a kinesthetic mode. Two mentioned that the intuition was symbolic and one that it was "just a faint idea." In the three situations where participants reported auditory intuitions, they heard actual words. Bill reported hearing "evaluation teams" and "interviewing." Jeanne's

inner voice (her own) said, “Aha, Maslow!” Ginny heard herself expressing the intuition to her colleagues. Of the three people providing details of their visual experience, two, Bill and Dana, noted that their visualizations were symbolic. For example, Bill saw symbolic data packages. The third “visualiser,” Mike, reported seeing people perform the technique he volunteered his group to lead.

In five cases participants noted an inner dialog. However, the type and sequencing of the dialog differed. In two situations, participants reported that their intuition was primarily a “knowing,” a classification that had not been listed in the question. Both of these people reported an inner dialog after the knowing. In Mike’s case, he noted that in trying to understand his position, he probably had a dialogue. A third participant, Susan, also reported a dialog after the intuition. Hers focused on the impact of the solution she had arrived at on the people involved in her organization. On the other hand, both Dana and Don, who interestingly were tackling similar types of problems as they sought to find topics or themes, experienced the dialog prior to or in the process of arriving at the intuition. In Dana’s case, “The intuition was symbolic . . . though I ‘saw’ it in my head, and it followed a lot of inner, and outer, dialogue.” In Don’s case, he thought of the entire process as “an inner dialogue of symbolic expressions. I neither heard, saw, or felt anything.”

Initial reactions

Participants were asked: “What was your initial reaction to the intuition: a) skepticism; b) rejection; c) reserved judgment; d) hesitation; e) relief; f) joy; g) certitude; h) other? Explain.” As with some of the other factors described, many of the participants’

responses included more than one item. However, a pattern can be observed. Responses primarily noted relief, joy, or certitude, alone or in combination with another of these emotions.

Of the eight participants who responded directly to this question, five indicated that they felt relief. Two of those felt joy as well. Three participants reported feeling certitude alone, and one reported joy, relief, and certitude. Of the other three, two reported a judgment. Don indicated that he thought this might be the right theme but that he “reserved judgment” until he tested it. Bill assessed the intuition as meeting “all the requirements for gaining commitment without threatening.” The final participant, Susan, provided a description. She experienced a “feeling much like placing the last piece in a jigsaw puzzle or solving an Agatha Christie or Sir Arthur Conan Doyle mystery.”

Signals

Participants’ responses concerning their initial reaction to intuitions indicated that most participants were aware of those reactions. An opposite pattern emerges when we examine their responses to the question, “Did you have some signal or clue that an intuition might occur? What was it?” Only 3 of the 11 participants reported such a signal. In each case, the signal was a feeling of waiting, anticipation, confidence, or “closure.” A fourth participant reported that she had received no signal but recorded her heightened emotion. Thus, while four of the participants sensed some emotional responses signaling an intuition, most participants denied any recognition of the impending intuition. Interestingly, three of those denying a signal were people who made conscious attempts to

access their intuition. One wonders what the relationship between these two factors might be.

Duration and clarity

Nowhere was there more congruence in participants' journals than in their assessment of the alacrity and clarity of their intuition. The intuition at the moment of solution was both quick and clear. Participants were asked whether the intuitions were a quick flash, a prolonged experience, very clear, vivid, somewhat clear or hazy. Of the 11, 7 replied that it was a quick flash. Three other responses used language which implied that the experience was quick. One participant described his intuition as having "one or two iterations over 30 to sixty seconds." Another used the words "suddenly realized," and the third, the exclamation "Aha!" Of the seven participants that directly mentioned clarity, two reported the intuition as vivid, two as very clear, two as clear and one as fairly clear. An additional three participants wrote of the intuition as being an understanding or knowing of what to do. Interestingly, given the wording of the question, five participants noted that the intuition was both quick and clear to vivid. Those five participants chose to include both characteristics, rather than citing one or the other.

Subsequent mental operations

Two of the journals' guiding questions solicited information on mental operations the participants might have engaged in after the intuition appeared. The first asked, "Did the intuition return to you at various times? When? How often? Did you expand on it? Explain." The second followed up with, "Did you analyze it? Did you gather information

to support and/or refute it? Explain.” As Table 10 indicates, responses from these two questions, taken together, indicate that for these participants, mental operations such as analysis seem intertwined with the accessing of intuition. However, the purposes of these analyses differed, ranging from refining the solution to testing it and from exploring an idea to understanding a decision. Additionally, responses suggest that the “moment of solution,” despite participants’ description of its quickness and clarity, may not be solely a one-time event. Instead, it might be a moment which crystalizes prior thought and galvanizes future actions.

Six indicated that the intuition they experienced at the moment of solution had returned later. Five of these noted that they had either expanded on the intuition or used it as a basis to organize group discussion, or to develop strategies, implementation plans, or further exploration. For example, Jan remarked that she had been “playing with the idea,” thinking about what exactly she should say. Susan explained, “because implementation has not taken place, the intuition returns to me when faced with the problem. This may be several times a week or day depending on my workload and my interaction with the staff.”

The other five participants had a somewhat different experience. One reported that the intuition “never left”; another explained that when the intuition occurred, she “knew how to start, when to finish and when there was enough for desired results.” From this we might infer a totality or wholeness of knowledge that might not require expansion. A third commented that the intuition, which in her case was a method of proceeding, had appeared before. Finally, the last participant, Dana, addressed not one specific intuition but a phenomenon that regularly occurs with her which casts a light of continuity on the process. She commented:

Mini-intuitions often come while I am writing. Arguments will occur to me, or certain combinations of words will come up in my word bubble. A line of thought will suddenly open up, and it might shed a new light on an earlier part of the piece.

Thus, for these human resource development managers, while intuitions occur at specific moments in time, they can be viewed as parts of continuing processes, during which many participants refined, explored, or expanded on the intuition.

Responses to the question on whether or not participants analyzed intuitions and/or gathered information to support or refute them provided more details on what participants view as the role of analysis vis-a-vis intuition. Seven participants reported analyzing the intuition. In most cases, the purpose of the analysis was to refine or implement the solution. Ginny noted she had gathered statistics and developed anecdotal data to support her ideas, Jan noted that she was in the process of gathering information. Susan explained that she was “still constantly refining the solution based on my increased understanding of the situation.” Mike also conducted analysis for implementation but did not move to looking for other solutions. Don and Bill reported both front- and back-end analysis, with Don noting that he tested and analyzed the idea throughout the process.

Marty’s analysis was a bit different. He reported examining the intuition to try to understand why he felt the way he did. Lynn reported no analysis, but remarked that she “thought about it in the overall framework and knew she was right.” In a similar vein, Jeanne did not further analyze her intuition because she believed that “it was strong enough to be accepted on its own weight.” Likewise, Dana pointed out that she usually didn’t

analyze intuitions. She noted that they usually serve her very well and she is afraid to “damage them by too much analysis.”

Participants’ responses to these two questions do support ideas developed by Bastick (1982) and Simonton (1980) that the process of arriving at intuitions is a continuous one and that analytical thinking is intertwined with intuitive processing. Six out of 11 of the participants responded affirmatively when asked if the intuition returned. Additionally, 7 of the 11 indicated that they analyzed their intuitions. However, the variations in participants’ responses and their different interpretations of words limits our ability to understand this data fully. For example, when Marty answered “no” to the first question and stated that his intuition never left and Susan pointed out that hers returned frequently, their experience may be more similar than the “yes” or “no” responses indicate.

Moreover, people’s descriptions of the type of analysis they performed after the intuition occurred and even their statements that none was necessary, highlight the different interpretations that may have been in their minds as they answered this question. A review of participants’ comments indicates that participants included, under the general rubric of analysis, such activities as testing the validity of the idea, refining the solution, gathering data to support a position, interpreting their own beliefs, and deciding whether or not to gather supporting data.

In the company of others

One of the most interesting findings of this study is that in the sample, people more often reported arriving at intuitions when they were in the company of others than when

they were alone. Of the 11 participants, 7 were with others at the moment of solution. Bill, Ginny, Marty, and Mike were at meetings involving several people. Jeanne, Sharon, and Susan were each with one other individual. This fact seems important, since most of our current models of the moment of solution and most investigation into the intuitive process seem to focus on the individual experiencing intuitions alone. Additionally, with the exception of brainstorming and synectics, most of the specific techniques used to access intuition or enhance its use seem directed at individuals.

A dynamic experience

Participants' comments about the intuitions they experienced provide a basis for us to view these experiences as dynamic and complex. Indeed, the words "ill-structured process" come to mind. Participants' experiences differed in many dimensions. The intuitions themselves ranged from identifying or rejecting specific outputs (themes, plans, or training programs) to a recognition of a process or strategy that could be applied to solve the problem. Participants experienced the intuitions through a variety of sensory and perceptual means. They felt, heard, saw, and spoke their intuitions. They also experienced inner dialogs and encountered symbols. They discussed a variety of initial reactions to the intuitions and recorded a number of different approaches for "analyzing" them.

Despite many differences, there were major similarities among participants' responses. First, while participants reported many different modes of experience intuition, most recorded more than one mode. Thus, intuition might be seen as multidimensional. Moreover, while initial reactions varied, people also reported more than one reaction.

Additionally, these reactions were clustered around the feelings of joy, relief, and certitude, as a reading of Fischbein (1987) might lead one to expect. There was striking congruence around the issues of clarity and alacrity. All participants reported their intuitions as either a clear experience or a quick one, and eight saw it as both. This clarity and spontaneity of intuitive experiences has been documented by major thinkers and researchers in the field, such as Bastick (1982), Fischbein (1987), Goldberg (1983), and Vaughan (1979).

There is also a similarity, albeit a still confusing one, around the continuing presence or return of the intuitions and the set of subsequent mental operations participants performed. Assigning specific meaning to the results of the responses is difficult because participants seemed to interpret such words as “return” and “analysis” differently. However, participants’ responses seem to provide support for the idea that the moment of intuition, while a discrete event, may not be as isolated from other mental activities as some might have believed. Instead, based on these results I suspect, as Bastick (1982) and Simonton (1980) have contended, that some intuitions are the products of a continuous process and that intuition in problem solving is linked closely to “analysis.” Further, one of the difficulties in understanding this relationship is apparent from participants’ responses; the term *analysis*, like the term *intuition*, is ubiquitous and its usage encompasses many different activities.

Actions taken

As stated, this study was to address the question, “What strategies and tactics do people use to access intuition when solving complex, ill-structured problems?” The above discussions on the problems people chose and the intuitions that occurred provide valuable

contextual information about people's actions. The comments following focus more directly on study findings relating to the central question. This section of the findings is based on participants' written journal responses to questions about their actions at the moment of solution.

Actions at and prior to the moment of solution

The journals include two direct references that suggest participants record their actions at or immediately before the moment of solution. The first instructs participants to describe the specific actions they were engaged in at or just before the overall problem solution occurred. The journals included a large space for participants to record this description. The second, a question in a list with other questions, uses somewhat different wording and reads, "What were you doing when and immediately before the intuition occurred?" Table 11 contains the responses to both the instruction and the question. In many cases one amplifies and or expands the other. Therefore, looking at them both together provides a more meaningful picture of participants' actions. While the comments in Table 11 have been summarized or synthesized to some extent, wherever possible participants are quoted directly to provide a fuller description of their activities.

Participants' comments about what they were doing when the intuition appeared can be clustered into two groups: those participants who were in the company of others and those who were alone. Given that division, there is a startling congruence in the responses of the seven people who were with others. In their journals, 6 of the 7 noted that they were listening at the moment of intuition. The seventh, Jeanne, indicated that she was talking.

However, close examination of the interview comments indicate that she, too, was listening immediately before the intuition occurred. This data is noteworthy principally because previous reports of people's actions at the moment of solution have not highlighted listening as a key activity. Moreover, while the fact that all participants who were with others at the moment of intuition is not statistically significant, it is surprising and perhaps worthy of further investigation. The activity "listening" is, of course, a broad one and additional analysis will provide more information; i.e., participants' behaviors, the type of listening they were engaged in, and the sequence of events as they recall it. Other behaviors participants listed in the journals included observing, idea generating, and reading.

The responses of the four participants who were alone at the moment of intuition can also be grouped. Two of them reported involvement in work related activities. Lynn, for example, reported being immersed in the topic, and surrounded by course materials. She was reading and listening to a videotape when she experienced an intuitive flash. Don described sitting in his office in a fairly long brainstorming process writing words and images on a note pad. The other two reported other types of activities. Jan was driving home from work and listening to country music. Dana noted that her intuitions about editorial topics almost always come when she is doing something unrelated to work, such as cooking, commuting, unrelated reading, and exercising. Despite the fact that the latter two participants were not physically at work, there is some evidence that their minds were still in a work mode. Indeed, later in the interview, Jan mentioned that she often used her time in the car to mull over work problems.

Active engagement

Despite their involvement in differing activities, 10 of the 11 participants reported being actively engaged in solving the problem. The nature of their engagement, however, differed. They described themselves as actively working on the problem and mulling it over, being engaged in a general sense, playing with the idea, beginning the journey, and leading the discussion. They mentioned trying to understand the problem from their employees' point of view and examining possible options. Finally, one participant wrote of putting energy into someone else's problem. Only one participant, Dana, said she was not actively engaged in solving the problem. She indicated that for her:

Intuitions seem to come most reliably when I've left the problem alone for a while. I might have thought about parts of the problem earlier, and I'm sure I do a lot of sorting out of bad ideas by an almost unconscious process, but intuition never comes on demand. I can set the stage by feeding in some elements to consider, but I can never sit down and consciously follow a set of rules to reach an insight. When I do that, what I get is a pancake instead of a souffle.

Participant reports about being actively engaged seem somewhat surprising. Most people associate intuitions with distance from the problem. Indeed, such strategies as brainstorming and creating analogies, as well as the concept of incubation, seem to be based on the premise of disengaging oneself. Based on my knowledge of anecdotal data on how intuitions appear, Dana's remarks would seem a more congruent response than those of the other participants who said they were actively engaged in solving the problem. How then are people reporting being actively engaged? And what is the nature of the

engagement they experience? More knowledge about the relationship between engagement and nonengagement could perhaps help people develop or enhance strategies or tactics to access intuition. The issue of engagement, like the activity of listening, will receive additional focus in Part 2 of this chapter.

Intentionality

Participants' responses to the question, "Did you intentionally take some action to access your intuition? What did you do?", indicated that most participants either intentionally took steps to access their intuition or were aware that they would automatically do so. Only three people, however, specifically answered this question by saying "yes." Don reported having developed an established pattern for creating ad images, one that he uses to solve other types of business problems. Dana explained that she accesses her intuition very indirectly and that while she can "open the door to insight" by trying to put herself in a clear state of receptivity, she can't turn her intuition on "like a tap." She also reports being able to rid herself of distractions and pushing the problem up to a high level of consciousness. Lynn indicated that she just starts working on the problem and expects that sooner or later "intuition will kick in."

While not directly addressing the question, Ginny and Susan provided descriptions of actions they took to access their intuition. Ginny mentioned that she became quiet and settled down. Susan said she generated ideas then "sat back" and thought about them. Marty noted that it was always there, and he did not have to "access" it. Bill, who provided a negative response, mentioned that this was "a fairly routine mode" for him. These last two responses indicate that without additional information, it is impossible to

determine whether or not those who said “no” did so because they habitually experienced intuitions and felt no need to access them or because they were consciously unaware of their actions. This issue is further explored in Part 2 of this chapter.

Backdrop.

Participants’ remarks in their journals about their actions at or immediately before the moment of solution provide a preliminary glimpse into the discussion of the strategies and tactics they use to access intuition, discussed in greater detail in the next part of this chapter. The journal comments, while incomplete and not allowing for additional inquiry, provide a foundation for further exploration.

These remarks indicate that those participants who were in the company of others when an intuition occurred found themselves listening. They also indicate that, with one exception, they viewed themselves as being engaged in solving the problem. While there was less clarity around the issue of intentionality, seven participants indicated they were either consciously aware of taking actions to access their intuition, or did not “need” to take such actions.

Part 2 : Content Analysis of Journal and Interviews

Introduction

Part 1 of this chapter presents data from participants' journals that document the problems they chose, the intuitions that occurred to them as they attempted to solve those problems, and the actions they took at or before the moment of intuition. After participants completed their journals, they participated in a 45 to 60 minute interview. During the interviews, participants were asked to provide more information about the situation described in the journals. They also discussed accessing intuition in other circumstances. This section of the report presents these additional findings. To provide consistency and continuity, I will use the findings presented in Part 1 of Chapter 5 as the starting point for the discussion here, summarizing them or briefly restating them where necessary to integrate the data from the interviews. I have also modified Tables 9, 10, and 11 to include some additional data.

The data presented here were derived from an in-depth, line-by-line examination of journal and interview transcripts. In the first review of the transcripts 70 elements, which seemed pertinent to the study findings, emerged from the data. These elements were based on either answers to the instructions, on questions in the journal or interviews, or on additional comments participants offered. The original list was then reduced to 39 elements grouped into five major categories, with one additional element. In eliminating and/or combining elements, I first identified those elements with less than three discrete examples. Then I combined similar elements, sometimes merging their original titles or retitling them. Finally I grouped the elements into the five categories shown in Table 12. The categories

are: 1) Problem elements; 2) Intuition elements; 3) Actions around the moment of solution; 4) Actions to access intuition; and 5) Participants' perspectives. The final element, View of Process, listed comments by individuals on their process to arrive at intuition. I used this to cross-reference data.

This part of the report will highlight findings in each of the five categories. It is divided into four sections. The first section, "Problems expanded," and the second, "Intuitions revisited," address the findings in the first two categories. They build on the findings presented in Part 1 of Chapter 5 and note additions to, or differences from, data provided in the journals. The third section is titled, "Actions to access intuition." It also builds on material in Part 1, but in addition, it integrates participant responses on how they access intuition in other circumstances. The fourth presents "Participants' perspectives" drawn from their comments.

Problems expanded

As indicated in Part 1, the problems chosen by participants were complex, ill-structured problems. While the subject matter varied, all involved some kind of design or planning activity; 9 of 11 participants judged their problems to be complex, moderately complex, or highly complex; 8 believed they were under some pressure to solve the problems. All saw some kind of risk for themselves, their organization or others, either in the specific solution being considered or in continuing the present state of affairs.

The elements grouped in the category called Problem Elements are: Problem and problem restatement; Subject matter; Problem complexity; Problem importance; Pressure to

Table 12

Study Results

Category 1 Problem elements	Category 2 Intuition elements	Category 3 Actions around the moment of solution			Category 4 Actions to access intuition	Category 5 Participants' perspectives
		Intuition and intuition expanded	Actions at the moment of solution	Actions at the moment of solution		
Problem and problem expansion	Intuition and intuition expanded	Actions at the moment of solution	Actions at the moment of solution	<u>Group 1:</u> Immersion	Background knowledge	
Subject matter	Mode	Actively engaged in solving the problem?	Actively engaged in solving the problem?	Thinking	Concern/desire to solve problem	
Problem complexity	Alacrity and clarity of experience	Intentionally acted to access intuition	Intentionally acted to access intuition	Undirected thinking	Reliance on intuition	
Problem importance	Initial reaction	Do you consciously access intuition?	Do you consciously access intuition?	Searching	Thinker type	
Pressure to solve	Analysis performed			Making connections	Non-cognitive thinking	
Risk	Duration/expansion of intuition			Listening	Structure in mind	
	Signal			Observing	Role of intuition	
	Alone or with others			Idea generating		
				Reading		
				Sitting		
				Accessing patterns		
				<u>Group 2:</u> Experiencing confusion		
				Ideas coming together		
				Splitting focus		

*The final element, View of process, listed comments by individuals on their process to arrive at intuitions. I used this to cross-reference data.

solve; and Amount of risk. Participant data for these elements are recorded in Tables 9 and 13. Table 9 includes data from the journals, and Table 13 also incorporates information from the interviews.

As a comparison of Table 13 with Table 9 illustrates, most of participants' interview comments about the problems they chose were problem expansions or restatements. Participants' comments did not serve to replace their earlier descriptions. Rather the comments added additional dimensions or depth. Thus, Bill's problem shifted from one of persuading a group to adopt an executive recruitment plan to a "commitment" problem where Bill needed to get people to change, "to really embrace," the new approach. Likewise, Jan viewed hers more specifically as a strategic issue, and Jeanne pointed out that her real task was not just to devise a scoring scheme for the game, but also to come up with a rationale that could support that scheme. In restating his problem, Mike brought out that a very key factor was that he was representing his group and that seven other people were relying on him. This not only complicated the problem, but it made achieving an appropriate solution more important.

Other participant comments also reflected on the perceived importance of solving the problem. Lynn viewed her session as critical to the company's future direction. Bill considered his "a core business issue," and both Marty and Susan were concerned about employee morale. Jeanne noted she wanted to help her husband to find closure for his ten-year project, and Sharon wanted her boss to see her in a helpful way. Sharon also mentioned that this problem was taking up her boss's time. Ginny had been working on her problem for several months. Jan's problem had lasted two years.

Table 13

Problems Expanded (from Journals and Interviews)

Elements	"Bill"	"Dana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Lynne"	"Marty"	"Mike"	"Sharon"	"Susan"
Problem and problem explanation	Persuade a group to adopt executive recruiting plan; resource planning; ... Commitment problem; people would change.	Choose topics for editorials; editorial planning; ... Discrete decision points.	Design a recruitment ad. ... Come up with a theme.	Create a new approach for human resource utilization; planning; training; etc. Systems problem.	Develop plan to persuade boss to hire people. Strategic business issue has impact.	Create game scoring scheme. Needed rationale for reaching way to explain moves.	Develop training design with public relations component. Gain commitment; determine implementation/feedback.	Approve/determine plan for feedback.	Design activity that group would buy. Represented group; important task.	Help boss plan approach to manage perception problems.	Develop plan to improve morale/efficiency. Concerned about morale.
Subject Matter	Resource planning; executive selection and assignment	Editorial planning	Designing ad theme	Multiple HRD issues: selection, training, job design, etc.	Hiring; resource planning	Game design	Program design; public relations	Organizational effectiveness	Program design with communication dynamics	Perception of boss' supervisor	Program design; organization effectiveness
Problem Complexity	Highly complex; multiple answers	Complex; multiple answers	Reasonably complex; infinite number of themes	Complex; systemwide	Complex; multiple answers	Complex; multiple answers	Complex; multiple answers	Complex; multiple answers	Some-what complex; multiple answers	Complex; multiple answers	Complex; multiple answers
Problem Importance	Extremely important People the determinants of success.	Extremely important. Didn't want to give platinudes.	Moderately important	Extremely important; very expensive in both direct & indirect costs.	Extremely important. Had sought headcount for two years.	Very important. Wanted to find closure because of husband's interest.	Extremely important. Critical to future direction.	Very important	Moderately important He and the group would look weak if had choice..	Very important for boss. Likes boss to see her as helpful.	Very important
Pressure to Solve?	Yes. Needed recruits within next 60 days.	Yes. Time. Tight deadline.	No. Time pressure was not really a factor.	Yes. Pressure to produce better staff.	Yes. Self-imposed. Two years' duration.	No. Ten year project.	Yes. Time. One day to do work.	Yes. Some.	Yes. Time, no warning.	Yes. Self-imposed. Taking boss's time.	No. Thought about it for months.
Risk	No risk in solution; great risk with no change (for organization).	High in the beginning (for organization).	Some risk (for organization) little for self. Risk really minimal.	Some risk (for organization). Risky problems existing, motivated to solve.	Some risk (for self).	Moderately high risk (for relationship).	Great risk (for self, department).	Moderately high risk (for organization).	Not much risk but he and group could be embarrassed.	Solution less risk than high risk problem (for boss).	Great risk (for self, for organization, if not resolved).

Participants' comments about time pressures offered some insight about the role a lack of time might play in engineering intuitions. Some participants (Ginny, Jan, Jeanne, Sharon, and Susan) presented long-standing or other problems where time spent or not spent seemed to be a factor in problem importance. Others (Bill, Dana, Lynn, Marty, and Mike) reported time as a pressure driving immediate solution of the problem. For example, Mike believed that if he did not act quickly, he and his group would get stuck doing something that they didn't want to do. So, for Mike, time was part of the pressure to act quickly. Don, alone, denied that lack of time was a factor in his problem-solving process. He noted that given such pressure, "the time factor would compress the time I have for doing it, but it wouldn't really change the way I would do it." This might also be relevant for others.

These findings, including Don's comment about time compressing the activity but not necessarily changing the process, raise some questions about Goldberg's (1983) and Agor's (1986) assertions about the role of time vis-a vis intuition in problem solving. Both considered that lack of time might be a factor causing people to access intuition to solve problems. However, in this study, problem complexity and importance seem more closely tied to accessing intuition than the need for immediate action. Moreover, the study results don't explain if the need for immediacy would result in people using the same process, a compressed process, or a different one to solve the problem.

Thus, the interviews substantiated participants' journals data on the problems chosen. Participants provided additional information on the depth and complexity of the problems. They also explained the problem importance. Some participants reported time

as a pressure driving immediate solution of the problem. However, in other situations time spent rather than immediacy was rated as a pressure.

Intuitions revisited

As was reported in Part 1, 7 of the 11 participants were with at least one other person when the intuition appeared. As noted then, participants' intuitions were primarily plans or designs, experienced via multiple sensory modes. The intuitions were clear and quick, and participants reacted with joy, relief, and/or certitude. Only three participants noted receiving a clear signal of the impending intuition. Six stated that the intuition either remained with them or reoccurred. Finally, while the relationship between intuition and analysis remains murky, several participants reported different types of analysis being performed.

The elements grouped under the category Intuition elements are: Intuition and intuition expanded; Mode: Alacrity and clarity of experience; Initial reaction; Analysis performed; Duration/expansion of intuition; Signal; and Alone or with others. Participant data for these elements are recorded on Tables 10 and 14. Table 10 includes data from the journals and Table 14 adds information from the interviews.

As Table 14 indicates, participants gave additional details of their intuitions during the interviews. They also provided rich descriptions of the mode through which they experienced the intuitions as well as additional information on their reactions and the relation of the intuitions to analysis. While I will provide additional information on these

Table 14

Intuitions Revisited (from Journals and Interviews)

Elements	"Bill"	"Dana"	"Don"	"Ghiny"	"Jan"	"Jeanne"	"Lyns"	"Marty"	"Mike"	"Sharon"	"Susan"
Intuition and intuition expanded	Executives would accept plan. The teachable moment; people in pain would be receptive	Elements fall into pattern; topic almost apparent	Phrase—"Span spectrum"	Redesign job, selection, recruitment, training, etc. Moved from specific issue to diagnosis of system problem.	Understood way to proceed. Business strategy-based on backdrop to corporate policy.	Scoring scheme. Malow's idea: ready way to explain points—provide overall rationale.	Thoughts about training design. Entire plan; knew how all would work.	Rejection of one approach; immediate generation of other. Sequential, very quick.	Activity design	Intuition was "to get out in front of the problem"; When to use this approach.	Plan to present to improve organization's morale
Mood	Auditory and visual; is said in eye and ear.	Symbolic and visual. Special occasions that come together in pattern.	Inner dialog of symbolic expressions	Auditory. Ideas verbalize themselves.	A faint idea.	Auditory. Her inner voice; comes from "nowhere."	A knowing; dialog after	Knew it; perhaps felt it; dialog after	Visual. Saw a real picture.	Visual; kinesthetic. Focused herself saying, intuition.	Visual; kinesthetic; inner dialog
Clarity and experience	Quick experience. Required one or two iterations over 30-60 seconds.	Quick flash. The intuition came in a quick flash and I knew how the story line would go.	Clear quick flash. The idea to list "the spectrum" on my list of images was a clear, quick flash.	Clear, quick. When the intuition occurred, it came together of the pieces to form a new strategy.	Fairly clear. I was driving home worrying about it; suddenly realized that I had to see it personally.	Quick flash and vivid. I was impressed how sharp and clear it was.	Quick flash. I just knew instantly.	Quick flash. Again, I "knew" it. No doubt.	Very clear. Very clear though fog drifts in as I define details.	Very clear. It was very clear—"Aha!"—that's the way to go!	Quick flash. And, when intuition was so clear, I was surprised at my own reluctance to act on it.
Initial Reaction	Met all requirements for gaining commitment. I was listening intently. I just knew it.	Relief; joy	Reserved judgment. Usually feels he has made right decision	Certainty. Others "looked at back" looked at problem differently.	Relief	Relief and joy	Certainty	Certainty	Relief; joy; certainty. It felt right.	Relief	A feeling like placing last piece in puzzle. Apathetic. I said, "I'm not listening." Then, I said, "I'm listening."
Analysis performed	Yes. Before and after intuition. Tests different approaches.	No. Details to be worked out. Does not analyze intuition.	Analyzed thoroughly;	Gathered data, examples. Can marshal reasons to support intuitions.	Gathering information	No. Does not come from rational part; can sometimes be sequential afterwards.	No. Thought about it in overall framework; it made sense; it was exact (after I achieved results).	Thought about it to understand. Can rationalize why.	Analysis for implementation. Screens intuitive first automatically.	I felt a sense of recognition. "Oh, yes! That's what we can do!"	Yes. Refining solution
Duration/ expansion of Intuition	Expanded on	Not answered	Yes. Reflected	Expanded on	Yes. Thinking about details	Yes.	No return	Stayed	Not answered	Intuition had appeared before	Returns
Signal	Yes. Feeling of confidence facing the problem, even though no "real" solution was apparent.	No	No	Yes. Feeling of waiting; anticipation. I listen to it.	No	No	No. Not at or before the exact moment—but I did have heightened emotion.	No	No. Not that I'm aware of. It was just there.	No. No signal, but this thought is probably recurring more frequently as I find it helps.	Yes. I had a gut feeling that we were really close to what I had initially envisioned.
Alone or with others	With others; group setting	Alone	Alone	With others; group setting in a meeting	Alone	With one other; with husband	Alone	With others; during meeting; during proposal	With others; in midst of group	With others; with boss	With one other; with consultant

elements here, the interested reader may also find that the narrative descriptions in the vignettes give a fuller, more contextual picture of what happened to each person.

The intuitions experienced

Participants' restatements about the intuitions experienced provided more detail about both the intuitions experienced and the nature of those intuitions. For example, Bill saw his intuition as not only the solution, but also the knowledge of when to propose it—"the teachable moment." Jeanne reported that her intuition was the rationale behind the scoring scheme. Ginny indicated that hers came as a reaction to her specific suggestion for a pre-employment testing program. In a meeting she suddenly realized that the program was "a bandaid approach" that would not solve all problems facing her organization. Her intuition can then be seen as the reclassification of the problem from that of a single unit to a systemwide concern. In a similar vein, Jan saw the need to link her headcount issue to her organization's business goals, moving it from a hiring decision to a strategic one. Finally, Sharon realized that her intuition was not only the concept of "getting out in front of the problem," but also deciding when it fits.

Thus, while the participants' intuitions were frequently about plans or designs, they seem to be related to understanding underlying relationships or linkages. These understandings, then, served as the basis for plans or actions.

Comments on the mode in which participants experienced the intuitions and/or participants' reactions to them permit a better understanding of the experiences themselves and the power and meaning participants assigned them. For participants, the intuitions

were very real. For example, Mike explained he saw, (“ a real picture”). He amplified, “I could see the room in which I know it’s going to be presented, how the tables were arranged at that time, how the people were moving around the room.” Bill described experiencing intuitions as seeing “what goes on physically” and “watching it happen.” In this instance, he saw images of evaluation packages in his “mind’s eye, just like a little picture.” He also heard voices in his “mind’s ear,” as did Jeanne. Jeanne’s voice, which was her own, provided the rationale for the game’s scoring scheme when it said, “Aha, Maslow!” Both Sharon and Ginny also experienced auditory intuitions, although in their cases, they heard themselves expressing the intuitions to others; Sharon to her boss and Ginny at her meeting. Ginny explained that when she works with other people, the ideas verbalize themselves.

Participants expanded upon and amplified their earlier descriptions of initial reactions to the intuitions. Bill had noted that his response to the intuition was that it “meets all requirements for gaining commitment without threatening.” However, in the interview he said, “I knew it. I just knew it.” Mike stated, “I’m pleased with where I ended up. It feels right.” Sharon explained her reaction:

I knew it. I felt comfortable. I felt almost a sense of relaxation. I knew that this was absolutely an acceptable solution that I could sell to the management, that I could live with, that would be good for the people that we were working with. It was just that gut feeling. It was almost like a flash of light and then a sense of excitement and kind of a “whew.” A sense of relaxation.

And Ginny pointed out that her intuition not only provided certainty for her, but also affected the entire group she was in. She indicated that after she spoke,

Others went, almost an “Aha,” like, “Do you guess it is really that?” It was as if [when] I spoke up, the light bulb went on. I think the intuition was so powerful at that point in time that everyone sort of rocked back and started looking at the problem with a whole new pair of eyes.

Support from analysis

Participants clearly viewed analysis as a support to intuition. This is noteworthy because Bastick (1982) found that intuition was most frequently mentioned in contrast to analysis. Listening to participants speak, I heard much more evidence of complementariness than opposition. Indeed, participants’ comments indicated that they may not perceive analysis as a process separate from intuition, but one intertwined with it. Moreover, for these participants, the focus of analysis seemed to be explanations for or implementation of ideas that they had decided to carry out rather than for justification to act. Witness their comments:

[Intuition] does not come from any rational part. I’m not aware that I thought in any kind of linear pattern. As a matter of fact, usually if I have a good intuition, it’s as if I think in the middle of something. . . . I will sometimes see the whole problem, and I don’t always think about what I need to do first or second. I just have an intuition that there’s a way to go, and I’ll just go with it. I don’t necessarily have a lot of hard facts or data that I should do that. Then, sometimes

after I've had the intuition in kind of a Gestalt, I can go back and be sequential about it. But not always. (Jeanne)

It is interesting, too, that once I move from intuition to a decision, I usually can put all of the pieces together to support it in a logical way. I will just know. I am not sure that I marshal the ones that support my position, and ignore all the rest of them, but I usually can pick out those facts that will do it. (Ginny)

I have an initial reaction and I have to think about why. . . . Why. I can always come up with totally valid reasons and very logical reasons, but the response is intensely intuitive and very accurate. (Marty)

I'm using my reason on one level in looking at reading materials. But then when I know, it's a knowing. I just sort of know what I'm suppose to do, and its a feeling as well. Then, I'll go back and use my reason to support what I already know. (Lynn)

[In this instance] having seen this vision, I said, OK now let's really think about it. We've got eight of us. Where would we be? What exactly do we need? What kind of props do we have to prepare? How many rounds of the exercise can we run through? Can we do something to make sure that everybody gets a chance to participate rather than only three or four of doing that? That's not really looking at it saying, "does this intuition make any sense?" It was more, "well I'm sure it makes sense, now let's find out what materials I need to support it." (Mike)

[In other instances] I am in the position of being called upon frequently. . . to come up with not great, grandiose brainstorms but little suggestions of a slightly better way to do things. I tend to sort through it internally fairly quickly, and attack the ideas saying, “does that work?” Yes, no, whatever. Then I spell it out as a potential hypothesis to open up to see if other people reject it out of hand because they have some basis for information that I did not have, or if the idea seems to fit with their world view or mind set. All I’m doing, from the second it occurs to me, is trying to analyze it. To say “does that work? What are the major holes in it?” And then describe it, and describe the major holes. I don’t think I do anything. I think it is the way my mind works. It automatically does those things, rather than saying alright now think about it, concentrate on that. (Mike)

It’s not so much, ah, deductive—first a description and a problem, then a listing of alternatives and then a testing. I only do that when my back is against the wall. That’s an absolute fact. I will go back and say what are some alternatives and are there any alternatives at all once I come up with [a solution], but it’s very atypical of me .

I get to the solution quickly through intuition. When the stakes are high, I will try to come up with different ways of arriving at the same answer. I’ll test different approaches to the problem. [My hypothesis] could be wrong. So there’s a lot of back checking with others, several different ways of thinking to arrive at the same answer. But I really have a high degree of certainty that it’s the right one. (Bill)

Eventually, I will hit on a one-word image that I can build a good phrase/image from. I then fine-tune the phrase, writing out several versions to get it just right. I then test the theme out by trying to build the outlines of an ad around that theme. It has to work well as a headline (not too long, lends itself well to graphic representation). It has to fit well with the copy I have to write around it. Often, I have to be able to create a secondary theme as a spin-off from the main theme to use at the end of the ad (I believe that the original image ought to be reinforced later in the ad for maximum memorability and effectiveness) and if I can't hit on a good spin-off I may decide to scrap the main theme. If the image I've hit on passes all these tests, I've got my theme for the ad. (Don)

A match

Because I had not anticipated it, participants' comments about the intuitions they experienced proved startlingly congruent with several of the characteristics of intuition identified by Fischbein (1987) (see Table 3). Since this study's purposes did not include investigation of such a match, its discovery is an unanticipated finding of this research. Here, I will briefly touch on the characteristics and note how participants' responses illustrate them.

Self-evidence—Intuitions are self-evident when they appear as directly acceptable, without the need of formal justification or a formal proof. They appear to be true and self-explanatory. They have what Fischbein (1987) terms “behavioral meaningfulness.” Several of the study participants claimed that they “just knew” that their intuitions were appropriate. As Mike explained, he did not examine his intuitions to see if they made

sense, but rather to see if they worked. The quotations above, as well as participants' comments about mode of intuition and the clarity and spontaneity of the experience, are examples of self-evidence (see also Table 14).

Intrinsic certainty—Highly correlated to self-evidence is the idea of certainty. Because people have such a feeling of certainty about their intuitions, they believe them to be true. This can lead to premature actions or holding on to erroneous beliefs. Fischbein (1987, p. 47) notes that “experience has shown that robust intuitions—no matter if they are correct or not—tend to survive even when contradicted by systematic formal instruction.” Of the 11 participants in this study, 7 clearly reported a feeling of certainty at the moment of intuition; 3 others made statements from which we might infer certainty (see Table 14).

Perseverance—This is a stable condition where the intuition is resistant to alternative interpretations over time. While the intuitions described in the study were too new to examine for type of perseverance Fischbein highlighted, we can see some evidence of their continuity. For example, 7 of the 11 participants indicated that, for a while at least, the intuition had either stayed with them or returned (see Table 14).

Cohesiveness—Fischbein (1987, p. 47) noted that intuitions “impose themselves subjectively on the individual as absolute unique representations or interpretations.” He stated further (p. 49) that “The imperativeness of intuitions may be explained by the fact that they are not generally isolated mental conceptions. They express fundamental mental constraints organized in comprehensive structures.” This cohesiveness may explain the extreme force and intensity of Marty’s experience, as well as the faith that Lynn expressed.

Theory status—Fischbein claims that an intuition is a theory or a mini-theory expressed in a particular representation using a model, a paradigm, an analogy, a diagram, a behavioral construct, etc. Looking at the participants' intuitions (see Table 14), we can classify them into models (plans or training designs arrived at by Lynn, Marty, Mike and Susan); analogies (Sharon's "get out in front of the problem" and Bill's "teachable moment"); and paradigm shifts of understanding (Ginny's recognition of a systemwide approach, Jeanne's link with Maslow's hierarchy, and Jan's recognition of a way to link problem with business strategy). Both Don's and Dana's origination of ads and articles seem to be approaches to create theories.

Extrapolativeness—Intuitions allow us to move from the present to the future—to mentally leap, to extrapolate from data that are immediately accessible to information which exceeds our grasp. Both Westcott (1968) and Fischbein (1987) discuss this factor of intuition, and it was the subject of Bruner's (1973) seminal chapter on thinking, "Beyond the Information Given." This characteristic seemed present in each participant's stories. Most involved the creation of plans or designs for which participants had some, but not all, the information available to them, and which were directed toward persuading or convincing people to take some action. Dana's topic, Don's ad, and Sharon's process, while not exactly plans or designs, did require their generators to make assumptions about others' future actions for which participants did not have all the data.

Globalism—According to Fischbein (1987, p. 53), "the global character of intuition is reminiscent of the concept of Gestalt. Intuition is a structured cognition which offers a unitary global view (or insight) of a certain situation." In intuitions, the transfer from one situation to another is not made through deduction, but by "grasping, intuitively, directly,

the common global situation.” Referring to the work of Michael Polanyi (Fischbein 1987), Fischbein notes that intuition is an integrative tacit process based on subliminal and marginal clues. Thus, the process is hidden from people. What they are able to observe is only the tip of the iceberg, the smoke that accompanies fire. He also states that this globalism is expressed in a coherence due to a selection process which eliminates discordant clues and organizes others to present a unitary compact meaning. For example, the problem solver creates a central theme or story which frames and guides key information. This central, organizing message comes as a whole, either a new perspective or one that is reorganized. Participants’ statements about quickness and clarity provide evidence of their intuitions’ global character (see Table 14). Jeanne mentioned having the intuition “in a kind of Gestalt.” Ginny explained, “When the intuition occurred, it was a very clear coming together of the pieces to form a new statement,” and Dana said that once she had identified the topics she wrote about, writing went fairly quickly, but:

I have to have an idea of what the story is going to do, the tone I would like to set, and what I’d like the reader to do after reading it. I think pretty hard about those things before I start. The details come later. The intuition is about the big picture. It’s about the whole rather than the parts.

Implicitness—The notion of implicitness is based on the tacitness of the intuition. Fischbein (1987) points out that even though intuitions appear as self-evident, self-consistent cognitions, they are “the surface structure expression of tacit subjacent processes and mechanisms.” He claims that:

Not only does intuition hide its tacit strategies, it is automatically opposed to any analysis since this would annihilate its intrinsic certainty, its compactness, its robustness. As the result of such an analysis, the individual risks getting confused in his reasoning activity (p. 54).

The concept of implicitness, based on the tacit processes used to generate intuitions, may help explain Mike's comment that although he had originally seen his intuition clearly and vividly "the fog drifts in when I define details." It might also help us understand participants' earlier comments on the relationship of intuition to analysis. Most of those who addressed the issue discussed analysis in terms of supporting or implementing intuitions, not judging them. It also provides a basis for interpreting Dana's comment "I generally don't analyze my intuitions. They usually serve me very well and I think I am afraid to damage them by too much analysis." These participants reported analyzing the reasons why the intuition solves the problem, but not analyzing the intuition itself.

Every intuition presented by the participants may not illustrate all of the characteristics listed by Fischbein. However, examples of all the characteristics can be found in the group. In his summary on the characteristics of intuition, Fischbein notes that when we experience intuitions we mix past, present, and future events in a global image that almost automatically dictates immediate behavior. He claims that:

Intuition fulfills, at the intellectual level, the function fulfilled by perception at the sensorial level: intuition is the direct, cognitive prelude to action (mental or practical). It organizes information in a behaviorally meaningful and intrinsically credible structure.

Seen from this perspective, intuition is not a process that we use instead of analysis, or a style of thinking used by some. Rather, it is a precursor, or perhaps prerequisite, to mental action for us all. The nature of intuitions and our inability to directly observe the tacit processes claimed to produce them does hinder us from understanding how we intuit. At the same time, we can observe, at least to some degree, the actions we take at or during the moment of solution. The next section of the report will present participants' observations.

Actions to access intuition

The findings presented here move us more directly to the central question of this dissertation: "What strategies and tactics do people use to access intuition when they solve complex, ill-structured problems?" This section of the report describes peoples' actions just before or during the moment of solution. It also discusses the actions as strategies or tactics.

Findings in Category 3, Actions Around the Moment of Solution, are provided in Table 15; those from Category 4, Actions to Access Intuition are in Table 16. Table 15 adds to the data presented in Table 11, Chapter 5, Part 1. The information in the row labeled, "Actions at the moment of solution," deals solely with the central problem participants identified for the case study. This row also combines data from the two rows in Table 11 labeled, "Actions at the time of and immediately before the intuition occurred" and "The specific actions at or just before the moment of solution." Table 16, on the other hand, also lists actions participants took in other instances to access intuition.

Let's look first at Table 16. In it I have divided listed actions into two groups. The basis of this division has to do with the nature of the actions in each group, specifically the vantage point of the participant or actor. In the first group of actions, the actor is an active protagonist; in the second, the actor is either passive or invisible. For example, when people say, "I read, I observe, I serve or make connections," they clearly identify themselves as directing the activities. However, when they talk of "experiencing confusion or having ideas coming together," the thinker seems in a less central and/or powerful relationship to the deed. The result may be a confusion in subject and object. Do the individuals act? Or are they acted upon?

Group I

Immersion.

According to Webster's New Collegiate Dictionary (p. 568), to immerse means "to plunge into something that surrounds or covers." Of the 11 study participants, 9 appeared to be immersed in the problem at the moment of solution or reported being immersed (see Table 16). Ginny, Jan, Jeanne, and Susan were attempting to solve problems that they had grappled with for months or years. Lynn spoke about being immersed after "surrounding" herself with materials. Mike read and researched until he found solutions that fit. Jan talked about "wallowing" in problems, Bill about "steeping" himself, and Marty about "mulling" ideas. Don reported that an issue he was currently considering:

Table 15

Actions Around the Moment of Solution (from Journals and Interviews)

Actions	"Bill"	"Dana"	"Don"	"Cindy"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Actions at the moment of solution	Listening Observing on the meeting on the general subject. Began chatted by a peer.	Thinking, day-dreaming. Something un-lead to work. Intuitions about editorial topics come while doing something not related to work.	Brainstorming. At the time I hit on the theme for the ad, I was sitting in my office in a fairly long brainstorming session, writing words/images on a notepad.	Working in a group Listening. Listening to the representatives of the problem components describe the problem from their points of view.	Listening. Driving. I had written out the scenario, and I needed to sleep on it. Then driving home, it began to fall into place.	Talking. Just talking about how complex the game would be unless we had an overarching framework. Listening, not really focused. Idea generating.	Reading. Listening to video tapes. Immersed. Started working & intuitive flash came 5 min. into project; had heightened anticipation & fully expected intuition to come through.	Sitting, reading, listening. Sitting in a meeting, at which I had arrived in a rush. Barely caught breath and got focus of the meeting.	Listening. Just before—I was listening to my boss describe his frustration.	Thinking; listening Idea generating. Weighing pros/cons of each solution; brainstorming; inductive reasoning; visioning end result; testing many alternatives against perception.	
Actively engaged in solving the problem?	Yes. Yes in a general sense. Issue was addressing selected performance problems.	No. Intuitions seem to come most reliably when I've left the problem alone for a while.	Yes. I was actively working on the problem. Was engaged in particular process.	Yes.	Yes. I was mulling it over—sort of "wallowing" in it.	Yes. I was playing with the ideas/brain. I wasn't gnashing my teeth.	Yes. In a very small way. I was beginning the journey without a map not knowing how to proceed. Things hadn't come together yet. Was immersed.	Yes. Yes, I was listening to some energy into helping him find a way to cope, not actively engaged in solving the problem myself.	Yes. Yes. I was leading the process. Was in meeting trying to solve problem.		
Intentionally acted to access	No. No. This is a fairly routine mode for me. But he describes pairing pain with opportunity.	Yes—got rid of distractions, pushed problem to a high level of consciousness. I think that I access my intuition very directly. I open the door for an insight by trying to put myself in a client's shoes of re-creativity, but I can't live it on like a map.	Yes. At described, I have an established pattern of creating ad images. The brainstorming techniques I use in this case are not terribly unusual, but I try to be as creative as possible from my methods I use to analyze other types of business problems.	Sat very still. Felt it come together. Is aware of capacity to access intuition in this way.	No. However, is aware ideas occur in transit.	No. No—except I am conscious that I let my mind wander and I usually try to think of the whole problem and not pieces.	Yes. I just starting expecting that sooner or later intuition would kick in.	No. Stated that he did not have to access intuition because it was there.	No.	I shut my mouth (stopped talking) and allowed the thoughts we had discussed settle. (a couple of minutes).	
Do you consciously access intuition?	I will consciously access my feelings.	Aware of establishing conditions but "didn't really realize it.	THEY DO BRUC-tured way to bring intuition to the fore. Thinks about problems a lot, and hopes intuition will "hit him."	Aware if the "its and lets it happen," intuitions will come. When it happens, she pays attention.	Leaves major problems; intentionally incubates after "wallowing" in ideas.	Quiets mind to use intuition.	I trusts it will happen, before, it just happened now beginning to learn how to work it..	Believes he has to go out of his way to "access anything else."	States she does not rely on intuition; had problem thinking of an example.	Makes herself sit back and think/reflect after generating alternatives.	

Table 16
Specific Actions to Access Intuition, Group 1 (from Journals and Interviews)

Actions	"Bill"	"Dana"	"Don"	"Glenn"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Immersion	<i>I step myself in the problem.</i>		<i>Problem floats in mind. He thinks about it a little bit at a time.</i>	Problem had gone on for a long time.	"Wallow", been concerned for two years.	Ten year project!	"Surrounded" self with materials.	"Mull's" ideas.	Not in this case, but immerses self in other instances.		Reflected on problem for number of months.
Thinking: Working on Task	Was in meeting.	<i>Often thinking about deadlines, sometimes day-dreaming.</i>	Thinking, making lists of words.	Was in meeting.	"Wallowing" in it; halfway thinking.	Doodling.	Thinking-working to solve problem.	"Mull's" ideas in other instances.	Examining alternatives.		Thinking-listening to recap of thoughts.
Undirected thinking		Finds angle when doing unrelated activity.			Was halfway listening to the music.	"Plays" with ideas; analytical mind disengaged.	Intuitions occur in early morning dreams.		Reads totally unrelated things that might spark ideas.		
Searching		Looks for images, angles.	<i>I think about it a lot and hope it will hit me.</i>	Waits for end of confusion.	"Wallow", leaves problems to incubate.	Dialogs, tries to understand problems.	Gathers data and reads.	Focuses on problem until issues is resolved.			Spent several months thinking about solution.
Making Connections	Pairing: pair with opportunity.	Matching: Ideas to template.	Pairing: Words "being" on alternatives.	Listens to both person talking and for message.		Matching: Create and constraints.	Matching: <i>Video tape and readings.</i>		Finds fit.	Finds fit: <i>Between the problem and process.</i>	Finds fit.
Listening	For meta messages. <i>The way they train consultants.</i>				Was listening to radio.	Listens with partial focus, like therapist.	Listening to video.	Listens and gets behind the words.	Listens to understand process, and decisions needed.	Boss was describing frustration.	Makes self sit back and think: <i>I can't talk and think at same time.</i>
Observing	Watched body language.					Listened to symptoms.					Collected data by observing, listening.
Idea generating			Brainstorming.			Idea generating.				Brainstorming.	Idea generating.

(table continues)

Table 16
 Specific Actions to Access Intuition, Group 1 (from Journals and Interviews)

Actions	"Bill"	"Dana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Reading							Reading course materials.		Reads; researches.		
Sitting	Sits quietly to get close to feelings.			Sits still and waits to hear the message.		Quietly mind; intuitive part begins to work.					Sits back and listens; lets ideas settle in.
Assessing patterns	I access patterns; they come together.	I have set up superstructures.	Connected images to company, job, and audience.								Observes a lot; intuition based on this.

(table continues)

Table 16
Specific Actions to Access Intuition, Group 2 (from Journals and Interviews)

Actions	"Bill"	"Dana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Experiencing confusion		Likes hearing something on the radio in your head.		Feels confusion. Likes "music on the line".		Quick mind, cuts out sensory data.					
Idea coming together	It's almost like watching it happen.	Two ideas will come together.	A theme will evolve.	Confusion comes together.		"Idea 'fell into place'."	Intuition "dawned on her."	See how pieces fit together; issue is resolved.			Idea pulled together different things.
Splitting focus	Focused on people/issue; being part, but outside, of group.	Has intuitions when daydreaming.		Like watching TV and hearing children play in other room.	Halfway thinking and halfway listening	Sort of thinking. Wasn't really focused.	Felt bi-level; felt split.	At some level, focuses on problem almost constantly.			

has just been floating in the back of my mind. But that's good, that's the way I want to do things like that. It will be floating around in the back of my mind, and I will think about it a little bit, a couple of minutes here, couple of minutes there, while I am in the car. Occasionally, I will talk to somebody about it and get some new inputs and new perspectives. Eventually that decision point will come.

Thinking—working on the task

Participants reported that intuitions occurred when they were thinking about the problem or in some way working on the task. Jeanne reported coming up with criteria to hire a media consultant while doodling. Don indicated that he was “thinking,” making lists of words, and Susan said she was thinking as she listened to a consultant recap prior discussion. Marty, Jan, and Mike mulled ideas, intentionally incubated or conducted research. Dana's ideas sometimes occurred when she was thinking about deadlines. This finding, while not really surprising, is interesting because the body of anecdotal data on actions at the moment of intuition supports the concept of intuition occurring around non-work-related activities. Supposedly, Einstein was resting under a tree during a bicycle ride when the theory of relativity occurred to him; Archimedes was in his tub when he realized a body would displace its own mass; and Howe conceived of the needle for the sewing machine when cannibals visited his dreams (Harman and Rheingold, 1984; Goldberg, 1983). Because the prevailing stories about actions at the moment of intuition place people outside the workplace, our work-related activities to access intuitions may not seem relevant to us!

Undirected thinking

Participants did report having intuitions during activities that were not related to the task at hand or the workplace. Lynn explained that if she thought about a problem before going to bed, the answer was there in the morning. Jan reported that she was halfway thinking and halfway listening to the music when her intuition occurred, and that she frequently experienced intuitions while driving or jogging. Jeanne found that she tries not to be sequential or analytical when she wants to be intuitive. Mike told us he finds it useful to look at additional sources, to read something totally unrelated that might spark an idea. Dana amplified:

It happens to me in writing often. I am looking for an image to hang a story on, an angle . Sometimes I'll find it in some totally unrelated field. I'll find it when I'm reading fiction or I'll find it when I'm engaged in some kind of athletic activity or conversation with someone about something totally different. All of a sudden, two ideas will come together in some way, and I will see a connection. That will be the start for me of seeing the form the article is going to take.

Searching

Nine of the participants acknowledged in some way that they were searching or looking for an answer to a problem when they accessed intuitions (See Table 15). Their activities ranged from actively trying to understand the problem (Marty) to thinking about it a great deal (Susan). Lynn and Mike read and did research with the expectation of finding solutions. Dana looked for images to hang stories on, and Jeanne sought actual intuitions.

Ginny waited for confusion to end for her verbalization of ideas and Jan frequently intentionally wallowed in problems and left them to incubate.

Perkins (1981) likens this type of mental searching to the search for something physical. He notes that searching by finding and considering new ideas and using different conceptual approaches is intrinsically goal-oriented and helps explain creative outcomes. He explains (1981):

In general, search occurs because the maker cannot devise a satisfactory outcome in a simple act of production. The maker has to produce alternatives and select among them, as in a sampling search, or combine sampling and progressive search in various ways (p. 160).

The fact that so many participants made statements that implied a type of search might be related to the complexities of the problems chosen or remembered. In cases where people deal with complex, ill-structured problems, they are not likely to achieve a resolution with a single thought.

Making connections

As Table 15 indicates participants used words like “matching, pairing,” and “finding a fit” to describe their actions at the moment of solution. The made connections culminated the search. For example, Don intentionally paired items on lists and noted that “sometimes that juxtaposition and the associational process will get a phrase generated.” Dana reported a sense of elements floating in her mind and noted that somehow, she

“brought together these two images.” Bill sensed that pairing the pain the executives felt with an opportunity to change would bring commitment. Jeanne, in attempting to hire a media consultant, simultaneously interviewed consultants and the representatives of the training audience. Then, she put the information together and came up with needed criteria. Mike noted that if he finds no fit at first, he continues searching. Mike does not remember a time when he couldn’t find a fit to make the connection. But he remarked, “I can recall lots of times when I didn’t find a fit in the calendar schedule I had allotted to it.”

Listening

Given that 7 of the 11 participants were not alone when their intuitions occurred, the presence of listening on this list of actions to access intuition is not remarkable. What is interesting, however, is that all 7 of those who were with others indicated that they were listening in some way during, or immediately before, the moment of solution. Moreover, people who were alone (Lynn and Jan) also reported listening (See Tables 15 and 16). While this study did not directly address the role of listening in accessing intuition and the differences in the types of listening participants experienced, the information uncovered here suggests that further research might be fruitful.

Interview data differs somewhat from the data presented in the journals. For example, Jeanne in her journal had reported talking and idea generating, but in the interview said: “I was listening, but I wasn’t so engaged in it, halfway listening to what he was saying and my mind really didn’t have a whole lot of thought except listening.” Additionally, participants’ discussions expanded their description of listening. The

pervasiveness of participants mentioning listening as a strategy raises such questions as what type of listening was going on? For what purpose? (See Table 17.)

Lynn reported listening to a video recorder playing a videotape. Her moment of solution came when she heard a phrase similar to what she was reading. Her listening experience seemed as if it were searching. Jan's experience seemed more similar to Mike's. She was listening to the radio as she was thinking about a problem. Mike was listening to a leader give directions about the problem to be solved. For them, the listening seemed to be incidental to the task at hand. On the other hand, Marty indicated he was trying to understand his employees' point of view, and Sharon was hearing her boss describe his frustration, wanting to be helpful and wanting him to think of her as a useful resource. Ginny and Susan appeared to be seeking clarity. Susan noted, "I can't talk and think at the same time." She noted that it helps to have someone synthesize her thoughts and paraphrase them so she can sit back, think, and listen.

While participants' statements illustrate the range of purposes for listening, there seemed to be a greater similarity in the nature of their actions. Six (Bill, Ginny, Jan, Jeanne, Lynn, and Marty) reported situations analogous to Jeanne's comments about halfway listening; they experienced some kind of split focus. Moreover, Bill, Ginny, and Marty all noted that in this situation they were listening for metamessages as counselors do. Jeanne described another situation in which she was listening like a good therapist. "In two ways I was listening for what was not being said, and I was listening to the stories that they were telling me."

Table 17
Listening Characteristics

Characteristics	"Bill"	"Dana"	"Don"	"Glenn"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Reported via-a- vis problem chosen	To others ✓			To others ✓	To radio ✓	To husband ✓	To videotape ✓	To others ✓	To other person ✓	To boss ✓	To consultant ✓
Listening for message, like therapist	✓			✓		✓		✓			
Halfway listening— split focus	✓			✓	✓	✓	✓		✓		
Listening for understanding								✓			
Expressed empathy										✓	
Sought or found clarity				✓							✓
Listening seemed incidental					✓				✓		
Seemed type of search							✓				

Additional actions

The actions discussed above (immersion, thinking-working on the task, undirected thinking, searching, making connections, and listening) appear to be the most compelling and pervasive actions participants took. However, they did mention a number of other specific actions. These are:

- observing
- idea generating
- reading
- sitting
- accessing patterns

As Table 16 indicates, each of these was mentioned by 2 to 4 participants. They may be related to other overarching actions such as searching, directed thinking, or making connections. For example, idea generating which includes brainstorming, could be viewed as directed thinking and a search activity. However, I listed it separately because a number of participants made direct comments about brainstorming or idea generating and because creating a stratification of strategies was beyond the scope of this study.

Nevertheless, from a surface perspective, we might relate idea generating, observing, and reading to searching, while sitting and accessing patterns seem more attuned to listening and making connections. For example, Bill reported sitting quietly to get close to his feelings. Ginny noted that she sits still and waits to hear the message; Jeanne quiets her mind so that the intuitive part begins to work; Susan sits back and listens

and lets her ideas settle in. The sitting back and settling down the participants identify seems related to focusing. For example, Jeanne speaks about tuning out data and Ginny about intentionally being still but listening for peripheral noise. Don, Marty, and Susan mentioned basing their solution on previous experiences or observations. Dana discovered during the study that she had set up “sort of a superstructure” in her mind based on her knowledge of her audience, field, and organization. Both Dana’s description of a grid in her mind and Bill’s explanation of accessing patterns to solve problems seem similar to the process outlined by Greeno (1978) as a model for explaining how we solve inducing problems. This scanning activity may be how we link past and present with future action.

Group 2

As Table 16 indicates, 3 of the 11 participants reported experiencing confusion immediately before or at the moment of solution, 8 mentioned ideas or pieces coming together, and 7 splitting focus. The three actions in these groups have in common a certain ambiguity about their perpetrator. Does the person carry out the deed, or is the doer acted upon?

In reporting the confusion they experienced, both Dana and Ginny noted hearing a noise or static. Ginny said, “I would have this static going on—like a small roar,” and Dana indicated that when she experienced the intuition it was as if she had a “radio in my head.” Ginny pointed out that the confusion was not unpleasant but brought with it a certain amount of anticipation and out of that would come the idea.

The statements of Dana, Ginny, and Jeanne reflect a varying range of responses and interactivity with this confusion. Dana reported that the confusion of elements in her head came together to form a pattern which matched a template she has. Likening the moment of solution to that of deciding to press the shutter of a camera where the moments before and after may be equally true, she noted, “My intuition selected a particular one to capture.” Ginny indicated that in this instance, the confusion “just happened” to her but that when confusion occurs, she does not disregard it, but chooses to listen. Jeanne intentionally quiets her mind, cuts out sensory data, and arrives at a meditative state. Then the intuitive part of her mind begins to work. Thus, each of these three people experiences confusion a different way with Dana observing it, Ginny attending to it, and Jeanne focusing it.

Ideas coming together

As indicated above, Dana, Jeanne, and Ginny perceived that to some extent, the intuition occurred on its own. In all, eight of the participants, including these three, expressed the concept of ideas coming together (Table 16). Their comments also illustrate the characteristic of the self-evidence of intuition and quality of certainty that many experience. Their thoughts are not mere abstractions but ideas or images, a dimension of size and space. As Dana explained, “the images I get are of things moving around into place to form a pattern.” The actions they take around these images falling together provide additional information about the moment of solution. Comments which highlight participants’ views of intuition as separate ideas which act on their own include Don’s remark about a theme evolving and Dana’s comment that two ideas come together. Bill

mentioned “watching it happen” and Ginny lets images come into her brain. Jeanne, Lynn, Marty, and Susan all talked about pieces or things falling into place or falling together.

In each of the above instances, the problem solver was a viewer rather than a protagonist. However, their stances were somewhat different. Ginny let the images come into her brain. For Lynn, the intuition dawned with all its detail. After Mike saw how the pieces fit together, he knew how the solution would work. Susan got a feeling of “this is it.” After Dana’s ideas come together, she saw connections. After Don’s themes evolved, he built phrases. Finally, Bill translated equations into pictures so that he could “watch things happen.” Thus, while participants reported intuitions acting on their own, they also mentioned a variety of activities to allow, promote, or follow-up on the seemingly self-directed actions of the mind.

Splitting focus

Responses listed under the title, “Splitting focus” (Table 16) also share the quality of dynamism discussed above. The question that comes to mind is: “Is my focus split or do I split it?” In this case, Lynn, who had reported her intuition “dawning” on her, seemed to be the most “acted upon” of the participants. She explained:

I feel like I’m split. That’s the only way I can put it. But I’m integrated at the same time. The mechanical part is doing the typing, gathering the data, not at a lower level but at a different level. All of a sudden another part kicks in and I can sense this bi-level thing happening and this other part is saying—its more of a knowing, a feeling. I get these little chills up and down my spine and then boom it’s there.

And all of a sudden the mechanical part of me starts doing what this other part of me knows to do. It integrates the whole.

Along with Lynn, Bill, Ginny, Jan, and Jeanne specifically mention a split focus of attention at the moment of solution. The latter four participants discuss the phenomena in terms of their actions to focus or attend. Bill talked about focusing on the group and what the issue was. Ginny mentioned her experience was like listening with one ear and waiting to hear with the other one. Jeanne described listening to her husband and thinking it was a pretty day. Jan reported halfway thinking about the problem and halfway listening to music when all of a sudden the intuition went “froomp” into her consciousness. Other participants’ comments indicated that they also might have split their focus either in solving the problem described or in other circumstances. Don reported writing lists, and brainstorming. Dana mentioned daydreaming and Marty noted that for some problems, “I think at some level I’m focusing on that almost constantly until it’s resolved.”

For the three elements listed in Group 2, the actor is unclear. Indeed, participants reported experiencing the ideas, or some part of themselves acting. They did not always take ownership for their deeds. The deeds not only had a life of their own, but they also acted upon the participants. Pieces fell into place and ideas dawned on people. These three elements support the characteristic of implicitness Fischbein (1987) discusses. We might contend that participants are reporting the marginal clues of subjacent processes. Thus, their statements are words that verbalize the tacit processes of the mind. These underlying implicit processes do seem of a different nature than the other actions participants describe. Participants do not report experiencing these processes directly. Instead, they describe

them as hidden or distant acts. Participants' statements imply that processes occur and provide clues to their nature.

Engagement revisited

Participants' interviews shed additional light on the nature of their engagement in the problem at hand. As both Table 11 and Table 15 indicate, 10 of the 11 participants specifically stated in their journals that they were actively engaged in solving the problem. The higher number of "yesses" to this question at first seemed inconsistent with anecdotal data on how intuitions appear (Harman and Rheingold, 1984; Goldberg, 1983). Based on reports of the moment of intuition noted by these and other writers, people expect intuitions to appear at unanticipated times. The results here also appeared at odds with problem-solving theories and strategies such as brainstorming which link intuition to the premise of disengagement, not intentional action (Davis, 1973). A seeming paradox occurs. First, 10 out of 11 participants reported searching for solutions, corroborating their statements concerning active engagement. At the same time, 7 out of 11 participants stated they split their focus. Thus, what participants reported is that while they actively engaged in problem solving, they also shifted or split their focus. Thus, disengagement or split focus coincides with active search. Moreover, 5 of the 11 participants made comments that tied this split focus directly to the moment of intuition. While the parameters of this simultaneous searching and disengagement need to be explored, identifying and documenting the paradox is a key step in better understanding the intuitive process.

Intentionality and awareness

As was reported in Part 1, only three participants indicated in their journals that they intentionally took some action to access their intuition. Others (Bill, Ginny, Marty and Susan) made statements from which intentionality might be inferred. The other four said “no” or provided few clues. During the interviews, participants were asked if they were conscious of accessing intuitions.

All but Sharon, who did not recognize operating on the basis of intuition, reported an awareness of accessing intuition; most presented specific actions they intentionally take (see Table 15). For example, Lynn trusted intuition would happen and noted that she was now beginning to learn how to work it. Mike said that his intuition, like Marty’s, was always there, and that he needed to go out of his way to access anything else. Bill, Dana, Don, Jan, Ginny, Marty, and Susan were aware of ways they accessed intuitions. Dana mentioned establishing the conditions, and Don thinking about a problem a lot. Jan and Marty wallowed and mulled. Ginny knew intuitions would come when she sat back and listened, and Jeanne expected them when she quieted her mind.

Given these comments and the earlier discussion on splitting focus, we can surmise that even though Bill, Ginny, Jan, Jeanne, Marty, Mike, and Susan either denied intentionality or were unclear in their journals, at some level, they were aware that their actions would result in intuition. Thus, they most likely implicitly knew that an intuition might appear even when they took no immediate explicit action to cause it to happen.

Strategies, tactics and processes

In this study I set out to discern what strategies and tactics people used to access intuition when they solved complex, ill-structured problems. I followed Gerber's (1983) definition of strategies as conscious deliberate acts and tactics as unconscious clusters of skills or habitual procedures. I had envisioned coming up with a list of actions that might be divided into strategies and tactics. Achieving that goal proved impossible. First, the classification of actions into strategies and tactics seems an activity to be done on a person-by-person basis, depending on how conscious the person is of his or her actions as, well as whether or not the actions were intentional. Second, in analyzing participants' comments, I perceived an additional layer of activity. This layer encompasses actions which might be termed tacit processes rather than strategies or tactics. Tacit processes are processes which exist, but which we are unable to describe or articulate. According to Fischbein, we see marginal clues of their activity, but do not directly perceive the action (Fischbein, 1987).

For example, Lynn mentioned intentionally surrounding herself with materials and being immersed. For Lynn, immersion may be a strategy. Ginny, Jan, Jeanne, and Susan did not list immersion as an action they took. However, they were immersed. For them, immersion is perhaps a tactic or an underlying tacit process.

The distinction between strategies, tactics, and tacit processes can be observed by looking at two separated but related actions: making connections and ideas coming together. The first element grouped such comments as "I paired," "I matched," "I found a fit," and "I brought together two images." In each of these cases, the participants recognized themselves taking some action. Yet, in some cases they deliberately acted to

achieve a specific result. For example, Don paired images to create themes, a process familiar to him that he had done before. He carried out a strategy. Bill, on the other hand, “paired pain with opportunity.” The action was unplanned. He called it instinctive. However, he believed that he made decisions based on accessing patterns and on applying his knowledge and agenda to the problem at hand. His act was a tactic... Dana also mentioned bringing two images together and noted that she did not know how. Dana’s action bordered on being a tacit process rather than an established tactic. Later, she also stated that, “all of a sudden, two ideas come together in some way” which implies that she felt as if the process occurred to her, rather than that she acted.

The chief determinants of a strategy, a tactic, or a tacit process were then the participants’ intentionality to act, awareness of what they were doing, and their view of the self vis-a-vis the act. A strategy is a conscious act that the self deliberately takes. A tactic is a cluster of skills or habitual procedures that the self performs without specific deliberate intention. A tacit process is something that happens that affects the self, but that is hidden and even seems outside of it. Not only can the same activities be identified as strategies, tactics, or tacit processes, but as Dana did, a person can present an activity one way one moment and another way in the next moment. People also can rapidly shift vantage points. Witness Don’s comment: “Sometimes a theme will start to evolve, and you will build a phrase around the word.”

Recognizing the complex interaction between specific acts, intentionality, and implicitness is important. Such knowledge will help to develop a deeper understanding of what happens at the moment of intuition. Knowing that people’s reports of their actions reflect the intermingling of acts of will and of awareness may enable researchers to look

behind people's statements to better identify or describe the events that occurred at the moment of solution. For example, whether I pull ideas together or they come together on their own, a connection is made. Simultaneously, if human resource developers aim to enhance people's ability to access intuition, the interrelationship of action, will, and awareness has significant implications.

These findings support the notion that individuals differ in their ability to be aware of and to reflect on their own thought processes. Findings are also rooted in the fact that belief systems about the amount of control an individual has at the moment of solution shift. Some people believe they can control events; others that they can't. Moreover, people place varying degrees of weight on intuitions with some trusting intuitions absolutely and others preferring a rational basis for action. These findings highlight the importance of attending to participants' values, beliefs, and knowledge when investigating their mental actions. The next segment of the report addresses participants' perspectives reported in this study.

Participants' Perspectives

Participants' comments revealed data valuable in understanding their background knowledge, values and belief systems as well as the specific problem solving events they described. Case study data in this category are clustered under the following seven elements (See Table 18):

Background knowledge

Concern/desire to solve the problem

Table 18

Participants' Perspectives

Perspectives	"Bill"	"Dana"	"Don"	"Ginny"	"Jan"	"Jeanne"	"Lynn"	"Marty"	"Mike"	"Sharon"	"Susan"
Background knowledge	Knew approach but had not applied it to problem.	Has foundation knowledge that she does not think about (a grid).	Knows audience, job requirements, company.	Extensive knowledge of symptoms; may attempt to solve.	Did not know vice president, but problem had gone on two years.	Had extensive knowledge of problem and Malow's hierarchy.	Knew training design, familiar with program to be conducted.	Knew survey results and employees.	Unfamiliar with problem at hand, but knows training and team.	Unfamiliar with problem at hand, knew boss and others.	New to situation; became familiar with the problem.
Concern/ desire to solve problem	High. Seized the moment to solve problem.	High. Wanted to give unique angle.	No expression of concern, but person needed to be hired.	High. Frustration with long-lasting problem.	High. Concerned over times; gut feelings of discomfort.	Concerned. Not overly anxious, but saw problem as important to spouse.	Concerned about how to proceed; time pressure.	High. Didn't want to "turn off" employees.	Concerned about reaction of group.	Concerned about helping boss; wants to see her as resource.	High. Concerned about employee's morale/boss's involvement.
Reliance on intuition	Trusted intuition but when other people help, she likes to have her own ideas.	Relies on intuition. Has served her well. Believes it was an advantage to creativity.	Will rarely make a decision on "gut feeling," but usually feels he has made the right choice.	Does not always act on intuition, but always pays attention to it.	Lies, sometimes acts, sometimes doesn't, couldn't remember when he is wrong based on intuition.	Always heads intuition, "absolutely".	Always heads/ trusts intuition.	Always goes with intuition. Anytime he didn't, it was wrong.	Always reads intuition; never rejects except for constraint.	Does not operate by intuition in a way that she recognizes.	Relies on intuition, heads it, combines with stored knowledge.
Thinker Type	Myers-Briggs Indicator type is intuitive, feeler.				Sees self as acting on intuitions a lot.	Considers self an inductive thinker.	Sees self as acting on intuition.	Cognitive style is "mulling."	Believes self to be highly intuitive (Myers-Briggs Indicator Type).	Does not consider self as one who uses intuition.	Generates ideas, then reflects.
Non-cognitive thinking	Felt ideas and words come in an attempt to describe.			Verbalizes ideas; Does not "think" before she says them.		Intuitions not from any rational part or linear pattern.	Uses reason to read, but "when I know, it's a knowing."	Intuition occurs, later he thinks "why".	Generally—thinks through intuitions before sharing.		
Structure in mind	Has knowledge of resources/ agenda, and accesses to solve problems.	Grid or superstructure of audience, topic, etc., exists in mind.	Generates options.	Generates ideas.				Hunches based on experience.	Reads with own underlying principles.		Gathers data from observation.
Role of intuition	In sensing what would change a group.					Comes up with what I have to test; pulls pieces together.			Gives suggestions of better ways to do things.		

Reliance on intuition

Thinker type

Non-cognitive thinking

Structure in mind

Role of intuition

Background knowledge.

Participants brought varying amounts of background knowledge to the problem they were solving. It seems almost as if all had some parts of a puzzle (as Jeanne noted), and the intuition provided the last piece. All but Mike and Susan expressed some familiarity with the problem at hand, and they even knew the people involved in the situation. Jan and Jeanne had the deepest background knowledge. Jeanne had been working on the game on and off for ten years and Jan's headcount had been an issue for two years. However, Jan did not know the vice president she needed to convince. Ginny's situation had gone on for several months. She reported being able to identify the symptoms, and diagnosing the problem was her breakthrough. Similarly, Bill's intuition was the identification of the solution to a long-standing personnel issue, and the moment to propose it. Marty and Susan knew both the indications of poor morale and their employees, but the plans to deal with these were new. Dana reported a background knowledge of field, organization and audience, but sought a topic. Don indicated he knew the company, the audience, and job requirements, but he needed a theme. Likewise, Lynn, familiar with program, audience, and purpose, sought the appropriate design.

Concern/desire to solve the problem.

Participants desired solutions. As indicated in Tables 9, 13, and 18, participants saw the problems as important and wanted to achieve resolution. What varied was the level and reason of importance. Both Mike and Don had indicated that their problem was only moderately important to them, and Don made no direct expression of concern. Mike, on the other hand, mentioned feeling pressure to act quickly to obtain a result he could defend to his team members. Bill's high level of concern seemed to stem from the significance he placed on employees as "the determinants of success in a professional service firm." And Ginny's seemed rooted in her frustration at dealing with symptoms over and over again. Both Mike and Susan expressed concern about their colleagues' morale and reactions. Similarly, Sharon wanted to help her boss, and Jeanne her husband. Dana wanted to find a unique angle, and Lynn considered her program part of a refocusing of the company. Jan expressed experiencing "real gut feelings of discomfort."

Reliance on intuition

All but one participant reported some reliance on intuition (See Table 18). This reliance ranged from absolute adherence to acknowledgement of usually feeling that the decision made was the right one. Jeanne, Lynn, Marty, and Mike all strongly stated the weight they placed on intuition. When asked if they heeded their intuitions, all said "always" or absolutely. Jeanne noted that she couldn't think of a time when intuition failed her and "the analytical part of my mind has failed me quite often." Mike said, "My critical faculty is my weakest one. I just always assume that the intuition is right." He explained that he would only reject an intuition because of practical details that constrained it. Lynn

indicated that she always trusted her intuition “because it has never failed me.” Marty remarked:

A long time ago, I can't tell you when, I decided that I personally have to go with my gut. And my gut reaction is my intuition. My intuition is to do something; and I'll do it. If I have to rationalize a reason I will, but I will go with my instincts invariably. Every time I don't I get in trouble. That's reality for me.

These four participants acted on the basis of their intuitions. When asked if they were sometimes wrong, three of them said no; but that they had made errors when they hadn't trusted intuition. Mike pointed out that since he doesn't deal with situations where a clear right or wrong answer exists, he could not answer the question.

Dana also reported relying on her intuitions as well as an unwillingness to expose them to analysis. She indicated that she believed she “worked harder” and “did more creative work” when she wasn't so loaded down with information. Bill and Susan viewed the situation somewhat differently. While they reported acting on the basis of intuition, they placed some caveats on their behavior. Susan indicated that in new situations she would be less likely to use intuition as a basis for action. Bill noted that the higher the stakes involved in the decision the more he seeks alternate solutions and the advice of others with different problem solving styles.

On the other hand, both Ginny and Jan indicated that while they heeded intuitions and paid attention to them, they did not always act on them. Ginny amplified saying that she rejected intuitions many times when they did not support what she believed. On the

other hand, Don specifically pointed out that he rarely will make a decision on a gut feeling. However, he usually “feels” his decisions are the right ones.

Of the 11 participants, only Sharon reported that she did not operate by intuition in a way that she recognized, and, “I bet there’s a lot of people like me.” She amplified, “Either I’m not using intuition at all, or I don’t know when I am. It’s not obvious to me.” Given Sharon’s statements, it is somewhat ironic that the intuition she shared as part of this study appears to be a specific strategy to access intuition for solving problems of perception. The concept of “getting out in front of the problem,” like the brainstorming employed by Don, is a structured approach to access ideas. The solver imagines all the action that needs to be taken to avoid a perception problem. Sharon had used the strategy before and could describe specific tasks or steps involved, even though she articulated them for the first time during the interview. Additionally, when asked how she would judge when to implement a new organization plan, she responded “when it fit.” Both Don and Sharon described structures of thought. One wonders if both Don and Sharon do not see themselves accessing intuition because they prefer or desire more clearly defined structures of thought. Perhaps the tacitness of intuition blocks their awareness of its presence.

Perspectives on thinking.

The remaining four elements in this category provide additional information on the role participants see intuition playing in their thought processes, and how participants view themselves as thinkers. Of the five who remarked on intuition’s role, four saw it as a generator of ideas or suggestions (See Table 18). The fifth, Bill, indicated he used intuitions in “sensing” what would change a group. Six seemed to define intuition as a

“non-cognitive” activity. Bill noted that he feels ideas and the words come to describe those ideas. Marty experiences intuitions and later thinks why. Ginny indicated that she verbalizes ideas; she does not “think” before she says them. Lynn spoke about having a “knowing,” and Jeanne noted that her intuitions were not rooted “in any rational part and did not exhibit any linear pattern.”

Eight participants mentioned the type of thinkers they perceived themselves to be or the thinking style they used (see Table 18). Two made specific reference to being identified as intuitors using the Myers-Briggs Type Indicator. Two others noted that they frequently acted on the basis of intuition. Additionally, Jeanne called herself an inductive thinker, Marty reported his thinking style to be “mulling,” and Susan noted she generates ideas and then reflects. Sharon stated specifically that she did believe that she acted on intuition.

Finally, five participants made specific reference to a body of stored knowledge or structure in their mind that they believed came into play during problem solving. For Susan, this structure was her observations; for Mike his principles; for Marty his past experience; for Bill his knowledge of resources and agenda; and for Dana a scaffold or superstructure of information.

Participants’ perspectives—their knowledge, beliefs, and values—affected both the actions they took and their explanations about them. For example, since Sharon did not recognize operating on the basis of intuition, she did not provide as much data as other participants who believed they regularly accessed intuitions. On the other hand, although Lynn consistently heeded intuition, and expressed absolute trust in it, she did not provide the depth of detail about her actions as, for example, did Jeanne or Ginny. I had the feeling

that she did not examine intuition closely. Participant comments provide a solid basis for affirming certain commonalities about these problem solvers. First, all had some basis of knowledge about the people involved, the problem situation, or the potential solution. Second, each had a desire to solve the problem. Finally, in varying degrees, all but one reported some reliance on intuition. These comments provide the springboard for a discussion in Part 3 on the dynamics of accessing intuition.

Part 3—Accessing intuition: The dynamics

Parts 1 and 2 of this chapter present study findings based on a comparative analysis of participants' journals and a line-by-line content analysis of the journals and interviews. Part 3 differs. It focuses on the same content but from a slightly different perspective—on interrelationships rather than distinctions, on process instead of product. Study participants Bill, Jeanne, and Marty mentioned that their intuitions occurred as they listened for the metamessage or the meaning behind the words. This section of the report documents the metamessage to the query “What strategies and tactics do people use to access intuition when they solve complex, ill-structured problems?” that I *heard* in participants' comments.

Listening to participants caused this question to shift slightly. Questions behind questions appeared. These included: How do problems, intuitions, and actions interrelate? What are the dynamics of the process of accessing intuition? How does intuition work? Are there any actions all participants took? Can stages or phases in a process be delineated? After reflecting, I arrived at the following understanding of the dynamics of accessing intuition that these participants presented. In the situations they described, a propelling

concern to solve a complex problem led to a continuous search and a spontaneous combustion.

Propelling concerns

Participants wanted to solve their problems. All participants judged the problem to be at least moderately important and all had some level of concern for arriving at a solution (see Tables 9, 13, and 18). Indeed, 9 of 11 saw their problem as very or extremely important and nine also exhibited a great desire to solve. In some cases, participants' concern revolved around organizational issues—executive recruitment, system malfunctions, employee morale. In other instances, participants wanted to achieve results for others, i.e., for a spouse, boss, or a team. Concerns fueled actions.

Moreover, participants engaged in situations which required them to think. They could not immediately come to a conclusion. Most were solved over a period of time. Their reasons needed to be important enough for the solvers to keep attempting to achieve a result. A few problems took less time than others. Don reported spending 30 minutes in his office to create his ad. However, he had thought about it before he sat down to develop the theme. Likewise, Marty's intuition was a seemingly spontaneous act. But, he was familiar with the morale issues his group was facing and the recommendations which had been set forth. Mike also acted quickly. He did, however, describe a search which he carried out very quickly. Moreover, Mike's concern to achieve a salable solution was quite evident.

In Nayak and Kitteringham's (1986) study of commercial breakthroughs, they identified the desire of the problem solver to solve the problem as a key determinant of a breakthrough. Nayak and Kitteringham found that in the sixteen companies they studied, the concept that preceded development began with a curiosity within the originating person. Noting they they entered the dungeons of research, they stated,

What we found in the dungeons were people best described as "problem solvers." Sometimes the new thing they devised solved a technical problem that had been itching at their cortex for a long time. Sometimes the new thing was the solution for a personal problem, a need unfulfilled that bears an interesting similarity to the creative impulse of the artist. Sometimes the problem was a mixture of technological curiosity and creative need. But it always was a *problem to be solved*, not a fortune to be made, not a market to be exploited. (p. 17)

Thus, they contend that the driving force behind transformational breakthroughs and transitional innovations is the problem solver. The source of the solution is the solver's idea or intuition. The enabling energy is that person's concern or determination to reach it. The problem solvers are then beset by an "itch," that they can't shake. Nayak (1989) later spoke of breakthroughs being led by "*committed problem solvers*" who carry their problems around with them. In breakthrough situations, such persons persevere against significant odds to implement new approaches. In everyday situations, concerned problem solvers keep searching until intuitions occur.

Complex problems

The second piece of the equation is the presence of a complex, ill-structured problem. In this study, participants were asked to select a complex, ill-structured problem as a basis for participation. All of them selected problems that they considered complex and that had multiple possible solutions.

Participants were able to identify complex, ill-structured problems and to describe actions taken at the moment of solution. Thus, the data indicate that for these participants both a complex, ill-structured problem and a concern to solve it were present. This study did not investigate the interrelationship between the two factors. Additionally, I do not claim that a complex, ill-structured problem is always present when intuitions occur. However, at least one participant, Mike, illustrated an ability to discern between problem types and reported that he only used intuitions when the problem warranted it. Perhaps others implicitly or explicitly also make this distinction.

Continuous search

Some sought problem resolutions over months or years. This search, although continuous, was not always constant, nor was it consistently intense. Indeed, five participants spoke of splitting focus at or just before the moment of solution. The commencing of engagement and disengagement, of passionate concern and detached reflection are among the most intriguing aspects of intuition dynamics. As Perkins (1981) mentions the search begins when the problem solver does not immediately reach the solution; it ends with an intuition when the solver makes a connection.

Perkins notes that the search for creative solutions to problems begins when solvers do not find the solution easily at hand. Some participant problems had extended over time. Bill, Dana, Don, Jan, Ginny, Jeanne, Susan, Lynn, and Marty all reported intuitions concerning problems they had been working on for some period of time. Only Mike reported an instance where he needed to decide on an immediate problem. With no warning, he had to come up with a plan for his group to publicly implement. Yet even in his case, the element of search is present, although shortened.

All the actions participants reported using to access intuition can be considered in relationship to searching and making connections. Immersion, the most frequently cited activity, accompanies and/or is the result of searching. Directed and undirected thinking are the settings for the journey. Listening is an approach or tool to accomplish the search. Other methods of searching are reading, observing, idea generating, sitting (settling), and accessing patterns. Experiencing confusion is the harbinger of journey's end; "ideas come together" is a metaphor for the final moment; and splitting focus is a description of that moment. Making connections is the action that denotes the end of search and the acceptance of intuition.

This concept of problem solving as a continuing search, accompanied by immersion and concluded by an associative link, has been addressed in a variety of ways by other thinkers and researchers. For example, Wallas' model (Davis, 1973), that has served as one major basis for thinking about creative problem solving, suggests that immersion follows preparation and precedes incubation and the final illumination. From this perch, the search is a hidden one that occurs during incubation. Both Bastick's (1982) and

Simonton's (1980) theories, while not directly mentioning searching, provide a foundation for understanding how this mental activity relates to intuition. Participants' search activities seem to be closely aligned to Bastick's concept of *combining by drifting*. This theory posits that the problem solver holds a problem in mind and moves through different emotional sets. When an emotional set is reached that is similar to some previous experience or knowledge, the solver links the two to create an intuition. Simonton posits that ideas pass over different thresholds of consciousness. Through association, we link ideas in the realm of cognition with less well-articulated concepts in the realms of behavior and the preconscious. He presents evidence, based on EKG readings, that this is a continuous process, marked by small discrete advances.

Spontaneous combustion.

Clearly, suddenly, quickly, the connection is made; the intuition is present; the search is over at least for the moment. The power and lucidity of this moment of solution perhaps gave rise to Wallas' term "illumination." Indeed, in earlier traditions, intuitions were considered revelations from a Divine Source and intrinsically true (Westcott, 1968). Participants' reports of the certainty, clarity, and spontaneity of their intuitions support the suggestion that intuitions appear as "spontaneous combustion" (see Table 14). Their language adds vitality to the proposition. Participants' intuitions went "Foomp" into conscious and were the "aha" that "rocked them back in their seats." As discussed in Part 2 (discussion on characteristics of intuition), participants were certain the intuitions were true, and the intuitions were self-evident. The result of this spontaneous combustion is the behavioral certainty that provides people with the ability to link past experience, present understanding, and future action (Fischbein, 1987).

The proposition

The proposition stated here is: A propelling concern to solve a complex problem leads to a continuous search and a spontaneous combustion. This proposition was not directly deduced from any one instance described by participants but was gleaned from their experiences as a whole. Yet the individuals' experiences fit within these parameters as the following examples illustrate.

Jeanne wanted very much to help her husband achieve closure on a game he had been working on for ten years. During a discussion in a car trip, she heard her voice clearly say, "Aha, Maslow," and intuited that Maslow's hierarchy would serve as the basis of a rationale for the game.

Jeanne's problem was complex (the game needed an overall scoring scheme to integrate and make sense of specific moves). Her propelling concern was to help her husband. While she did not note exactly how long she thought about the game in this instance, she had been working on the project for ten years—a search which was continuous but not all-absorbing. Her intuition was clear, quick, and vivid.

At a staff meeting when discussing one more solution to an intricate and long-standing set of organizational problems, Ginny suddenly verbalized her intuition that her company was hiring the wrong kind of person for the wrong kind of job. She explicitly stated her high level of concern to resolve this continuing and complex issue. She described her intuition as a "clear coming together of the pieces to form a new statement."

Her intuition was clear and vivid, not only immediately accepted by her, but the others in the group “rocked back in their seats and looked at the problem afresh.”

Mike’s situation differed. All events were compressed into a tight timeframe. Mike’s concern was to pick an activity that his group could do and would accept. His moderately complex problem was complicated further by the very short timeframe in which he had to act. His intuition pictured his colleagues carrying out the activity. He could see his colleagues running the relay race.

Most of the participants’ reports already fit within the parameters of the suggested proposition. There is, however, one seeming exception. Marty reported reacting “instantaneously” to someone else’s proposal. At first glance, his action seems too sudden to fit within the stated dimensions of the proposition. Yet, the interview data revealed that although Marty’s reaction was quick, the problem was important to him and he had been aware of the issues. We might speculate that he had, in fact, “mulled” possible approaches toward its solution and that the suggested approach did not match any tentative conclusions he had reached.

An in-depth analysis of this proposition, or the verification of its presence in other situations, is beyond the scope of this study. However, others may find it a useful lens to observe the dynamics of accessing intuition and further investigation and reflection may be valuable for researchers and practitioners.

CHAPTER 6: SUMMARY AND IMPLICATIONS

Introduction

How can people see what they cannot see, know what they cannot know? How can they, the actors, understand the processes of mind that direct their actions? This study queried, "What strategies and tactics do people use to access intuition when they solve complex, ill-structured problems?" In doing so, it examined people's actions. Participants reported what they did during, and just before, the moment of solution of a complex, ill-structured problem; that is, at the moment an overall problem solution was immanent. In journals, participants—11 human resource managers—documented a problem they solved, the intuition that occurred, and the actions they took. Later in interviews, managers provided more information about the instance described, as well as data about other times they had accessed intuition. Participant responses were analyzed in an attempt to identify deliberate and coordinated *strategies* as well as specific skills or clusters of related skills or procedures termed *tactics* (Gerber, 1983).

Participant reports cannot be viewed as windows to the mind beyond. Participants did not discuss how they solved the problems. Rather they recalled only what they did. Yet, these oral and written statements record observable events and evidence processes screened from problem solvers and researchers alike. Perhaps they can serve as mirrors. A close examination of the statements and the processes reflected in them yields questions for further research and suggestions for current practice. This report chapter summarizes the study results and presents implications for research and practice.

Summary of results

Study findings are grouped in the five major categories established as a result of analysis. These are: Problem elements, Intuition elements, Actions around the moment of solution, Actions to access intuition, and Participants' perspectives.

Problem elements

As instructed, the participants chose complex, ill-structured problems as the basis of their reflections. Problems chosen varied but all could be classified as plans or designs. Situations included finding a rationale for a game, a theme for an ad, and a topic for an article. Others were: diagnosing a system-wide organizational dysfunction; arriving at a new executive recruitment plan; designing training activities or strategies to overcome hiring deficiencies; perception problems; or employee morale (see Tables 9 and 13, pages 184 and 217). Moreover, all the problems chosen dealt with persuading or convincing someone of something, perhaps because of participants' roles in human resource development.

For the most part the problems chosen were important to the participants and most felt some pressure to solve them as well as some risk either in the situation or in maintaining the status quo. All but two of the problems were viewed as at least moderately important, and eight were considered very or extremely important. Of the 11 participants, 8 reported some pressure to solve the problems. The latter result supports Agor's (1986) perception that people use intuition when under pressure, particularly time pressure. Data on problem risk, although more ambiguous, indicated that nine participants saw some risk either in maintaining the status quo or in the particular solution being considered. This

result indicates that, as Palmer (1988) suggests, risk may be a factor in settings where people access intuition. However, participants interpreted the question in different ways, and therefore, results are ambiguous. Further inquiry would be very helpful in determining the part problem importance, risk, and pressure play in remembering or accessing intuition.

Intuition elements

The intuitions arrived at were similar in nature to the problems chosen. Intuitions were plans, designs, themes, or approaches (see Tables 10 and 14, pages 185 and 221). Taken as a group, the intuitions exhibited all of Fishbein's characteristics of intuition (Fischbein, 1987). The characteristics include: self-evidence, intrinsic certainty, perseverance, cohesiveness, theory status, extrapolativeness, globalism, and implicitness (see Table 3, Chapter 2 and discussion in Chapter 5, Part 2). Jeanne's intuition exhibits all of these characteristics. She suddenly realized that Maslow's hierarchy could serve as the basis of a rationale for a game she and her husband had been designing for ten years. Riding, conversing, looking at the clouds, and listening to her husband talk, she suddenly heard in her "mind's ear" her own voice say "Aha! Maslow!" Her intuition was self-evident. She needed no additional proof that Maslow's hierarchy could serve as the basis of the game's rationale. She was absolutely certain. The intuition had lasted, or persevered for some time before the interview. From her comments, I can surmise it had the force of conviction of an idea that might be hard to dislodge. The intuition was cohesive and was not an isolated conception, but a structure around which to build the entire scoring scheme. As the basis of the scheme, it exhibited theory status and was analogous to a model. The rationale itself helped Jeanne and Sam to extrapolate—to create and link the game's individual moves and the points each should receive. Jeanne experienced the

intuition in one fell swoop—or gestalt—and grasped immediately and directly the relationship between the hierarchy and the game. Thus, the intuition was global. It was also reached implicitly. Although she was engaged in solving the problem, Jeanne did not intentionally access intuition. She was “playing with the idea” and letting her mind wander. She did not direct her mental actions. Thus, Jeanne’s intuition exhibited all characteristics identified by Fischbein.

This congruence of participants’ intuitions with Fischbein’s characteristics of intuition was an unanticipated result of the study. Also unanticipated was the fact that 7 of the 11 participants experienced their intuition when in the company of others, an issue I had not considered ahead of time, but one I observed during the analysis. Further research is needed to determine whether the high proportion of people experiencing intuitions when with others is a coincidence—a fluke, and related only to this study—is a factor of the sample population’s occupation, is a consequence of the accessing of intuition in the workplace, or is related to some other issue.

All of the 11 participants indicated that their intuitions came quickly and/or clearly. The statements of many indicate both qualities were present. Similarly, certitude, relief, and joy were intermingled in participants’ initial reactions. These results not only contributed to understanding the data in light of Fischbein’s (1987) characteristics, but also supported Goldberg’s (1983) descriptions of intuitions.

Eight of the participants denied having any signal at all of the impending intuition, although two of these reported heightened anticipation. Worth noting is that three people did report signals of the intuition’s arrival. These signs were feelings of confidence or

anticipation. Also of note is the lack of evidence of conflict between analysis and intuition as separate modes of problem solving. I expected evidence of such conflict to be present since intuition is so often viewed as a process in contrast to analysis (Bastick, 1982). Reasons for its absence would be interesting to investigate. Perhaps the contrast was not noted because of the way the study question was worded. However, perhaps these participants viewed the relationship between intuition and analysis in a more complementary way than others have. Indeed, those participants who discussed the relationship between analysis and intuition cast analysis in the role of implementer and supporter rather than that of a separate and/or conflicting way of thinking. While some noted that they analyze intuitions, their comments revealed an ambiguity in the use of term analysis. Some participants used the term to mean gathering data or assessing the next step.

Actions at the moment of solution

In participants' journals, the single most reported action at the moment of solution was listening (see Table 11, page 186). All 7 participants who reported being with one or more persons at the moment of solution said that they were listening at the moment of solution. In addition, two others who were alone reported listening as well; Jan listened to the radio, and Lynn to a videotape. Participants' use of the word "listening" is somewhat ambiguous; they describe many different types of activities with the term. Participants provided some clues as to why and how they were listening. Some were trying to understand the message and the meta message, others were letting their minds wander. Some were doing both these things and also reported a splitting of focus. Some participants appeared to listen to other words, others heard their own words paraphrased or

restated. For some, the listening appeared intense; for others, incidental. While this study did not reveal the nuances concerning the relationships between listening and accessing intuitions, the results suggest that further study might be fruitful.

While the predominance of listening as an action taken at or just before the moment of solution was apparent from a review of participants' journals, the inclusion of the interviews in the content analysis provided a different perspective. It showed that other actions vied for preeminence in the pattern of events that preceded accessing intuition. These included immersion (reported by 9 participants), thinking about or working on task (10 participants), and searching, ideas coming together, and making connections (8 participants). This study made no attempt to sequence these actions; its purpose was to identify them. However, when ideas came together and connections were made, participants' situations illustrated a pattern of continuous searching that ended at the moment of solution. This pattern, as well as the data that indicated that people are often working on the task when intuitions occur, suggests, as Bastick (1982), Simonton (1980), and Perkins (1981) have, that intuitive processing exhibits a continuity of thought.

Actions to access intuition

The study uncovered two groups of actions used to access intuition (see Table 16, and discussion in Chapter 5, Part 2). In the first action group, the problem solver is clearly the actor. In the second, the problem solver seems to be either acted upon or absent from the action.

Group 1 includes the following actions: immersion, listening, searching, making connections, thinking about or working on task, undirected thinking, observing, idea generating, reading, sitting, and accessing patterns. The first five actions were each reported by 8 to 10 participants. The next one, undirected thinking, was reported by 5 participants. The last five were each mentioned by 2 to 4 participants.

Group 2 includes only three activities: experiencing confusion, reported by 3 participants; ideas coming together, 8 participants; and splitting focus, 7 participants. Participants frequently described these activities as events that occurred to them instead of as actions they took. For example, some spoke of “pieces coming together” and “being split,” while others talked about the same event using such words as “I brought two ideas together” and “I was focusing on them and on what the issue was.”

In general, these findings are consistent with earlier research. Immersion has long been associated with intuition and was the second of the four phases in Wallas’ model of creative problem solving (Davis, 1973). Wallas contended that creative problem solving involved: first, preparation; second, immersion; third, a period of incubation; and fourth, illumination (Davis, 1973). Goldberg (1983) raised the question that, given this model, gestation of ideas in today’s workplace may be different from the long incubation periods described in histories of literary composition and scientific invention. These findings lend support to Goldberg’s proposition that searching, not incubation, appears as a companion to immersion, and solutions are reached in varying amounts of time in the workplace. Searching itself had been identified by Perkins (1981) as a major component of the creative problem-solving endeavor. Additionally, the concept of searching is consistent with views of the process of intuition set forth by Bastick (1982) and Simonton (1980).

Making connections, which incorporates such activities as matching, pairing, and finding a fit, seems linked both to Wallas' concept of illumination (Davis, 1973) and to theories of associative thinking, propounded by many and discussed in relation to intuition by Bastick (1982), Simonton (1980), and Fischbein (1987).

However, the findings also hold some surprises. Based on a review of the literature, I would not have expected to find listening the most frequently mentioned action to access intuition. Its predominance is probably based on the fact that 7 of the 11 participants were not alone at the moment of solution. Also intriguing is the presence of the three activities in Group 2; (experiencing confusion, ideas coming together, and splitting focus.) Their presence and the way participants described them bear witness to the tacitness of the intuitive process (Fischbein, 1987). However, the variation in the way participants discussed the events which occurred indicates a disparity in people's perceptions about the control they have over their own mental processes. Some people seem more in control of the process than others. For example, Bill steeps himself, but Lynn reports being immersed. Interestingly, the same person often takes both perspectives at different times (i.e., Lynn also intentionally surrounded herself with materials).

Strategies, tactics, and processes

As a result of the study, I came to two overall conclusions about the strategies and tactics people use to access intuition. First, the actions people take include tacit processes as well as strategies and tactics. Second, whether or not an action is a strategy, a tactic, or a tacit process depends on what the action is, how deliberately the solver engages in it, and whether or not the solver is explicitly aware of taking action. For example, making

connections could be viewed in all three ways. The problem solver could, as Don did, deliberately match words and images to develop themes (strategy). Or the solver could intentionally seize the moment as Bill did when he paired people's pain from past errors with an opportunity to create a new executive recruitment system. Finally, the solver could "sense elements floating around and coming together in a pattern" as did Dana, and have a theme appear. These distinctions are important as we develop ways to help people enhance their ability to access intuition. Different approaches may enhance the use of strategies, tactics, and tacit process. Moreover, if awareness is, as it seems, a key factor, many of our efforts may profitably be diverted towards helping people identify their actions.

Participants' perspectives

The report captured participants' perspectives on intuition and its role in their thought process, as well as the background knowledge each brought to the study. As might be expected by the predominance of immersion as an action, all participants had some knowledge of the situation, the solution, or the people involved. Thus, the intuitions linked existing data rather than invented new information. All but one participant indicated that he or she relied on intuition in problem solving, reinforcing the research of Agor (1986), Silverman (1985), Issack (1980), and Isenberg (1984). All participants also expressed a moderate to high level of concern to solve the problem. In the journals, all noted that the problem was at least moderately important. In the interviews, participants expanded on this issue, emphasizing their concern for their organization, boss, spouse, or team.

The dynamics of accessing intuition

Based on these findings and building particularly on the works of Nayak (1989), Perkins (1981), Bastick (1982), Fishbein (1987), and Simonton (1980), I arrived at a perspective on the dynamics of accessing intuition. For these participants and the situations they described, I concluded: A propelling concern to solve a complex problem leads to continuous search and spontaneous combustion.

The basis for this premise is as follows. Participants reported concern or desire to solve the problems. The problems were complex and had multiple solutions. Participants searched to find the appropriate solution, some for months or years, others for moments. Although this search was continuous, it was not always constant. Finally, at the moment of solution, the intuition appeared clearly and spontaneously. This proposition, meant as a synthesis of these data and the beginnings of a substantive theory (Goetz and LeCompte, 1984), was true both for the group as a whole and for individual participants.

Implications for Research and Practice

This study has been an exploration, an attempt to develop some concepts or broad ideas about the actions we take to access intuition. The implications presented below reflect the investigative nature of the work. Most are research questions related to intuition and its role in problem solving. These are balanced by a few implications for practitioners.

Research

As evidenced by the literature review of this study, the amount of research on intuition and its role in problem solving is small. At the same time, our society is facing increasingly complex problems, which are often not solvable with the information at hand and which are likely candidates for intuitive processing. While the world has always faced such complex issues, advances in technology and the rapid rate of change are pushing these complex decisions further and further down the organizational and corporate ladders. This is happening in such diverse fields as agriculture, manufacturing, and transportation, as well as science and mathematics. Understanding how people access intuition is imperative for human resource development professionals to prepare adults in the workplace to carry out their jobs and to create organizational climates in which problems can successfully be solved. The results of this study indicate, as other studies have done, that intuition can be systematically studied. What is needed is a variety of different approaches focusing on different issues. The results also indicate that many people have a degree of awareness of the actions they take to solve problems. By pursuing the inquiry and pooling our knowledge, human resource development professionals and researchers can become more explicitly aware of actions to access intuitions.

A framework for research and reference

Urgently needed is a conceptual framework for intuition. Such a framework would define terms and establish relationships among uses of the term and across disciplines of study. A suitable starting place might be the analysis of Fischbein (1987). Fischbein asserts that intuitions are used to understand, to know, to learn, and to solve problems.

His analysis of intuition in relation to problem solving made this study possible. Using Fischbein's definition of an anticipatory problem-solving intuition as the moment the solution of the problem became immanent, anchored the study to a discernible moment in time and permitted me to gather comparable data. Powerful as it is, Fischbein's theory does not extend to intuition used in settings of understanding, learning, or knowing. The development of a conceptual framework that includes and orders various perspectives on intuition was beyond the scope of this study. It may be beyond the grasp of any one scholar in any one field. However, a unified view of what intuitions are and how people access and use them would benefit a variety of disciplines.

An information processing perspective

This study highlighted how people access intuitions to solve complex, ill-structured problems. While the results lead to some conclusions, major questions remain. For example:

Would people take the same actions to access intuition if the problems had not been complex?

Are there different actions people take depending on the nature of the complex, ill-structured problem being solved?

Are there some tasks that lend themselves to Dana's approach of setting up the conditions for intuition to work?

Are there tasks that call for different methods such as Sharon's "getting out in front of the problem" strategy, used to manage perceptions?

Following the lead of information processing theorists such as Greeno (1978), Churchman (1971), and Newell and Simon (1972) will be especially useful to determine how actions differ based on tasks. Greeno's discussion of *inducing structure*, *transformation*, and *word arrangement* problem types provides some basis for such an inquiry (1978). This stance is a viable alternative to pursuing a study of the use of intuition based on differences in personality style. Certainly, as Jung and others posit, some people may tend to prefer intuiting to other mental functions (Goldberg, 1983). However, because of job and life circumstances, people of differing preferences need to deal with complex, ill-structured problems—and thus need to access intuition. A focus on the relationship between accessing intuition and different problem types would yield valuable data to human resource professionals designing training or professional development activities. This approach seems more pertinent to thinking about intuitive processing today than considering it only in terms of personality factors (Simon, 1987).

The settings

Clearly, intuition needs to be analyzed in a variety of settings. This study focused on its use in the workplace; specifically, the accessing of intuition by human resource development managers. Two aspects of the setting hold particular interest. First, 7 out of 11 participants were not alone. Second, 10 out of 11 reported that they were thinking about the problem or working on the task when the intuition occurred. For these managers

intuition was not a solitary process, and its onset was not an event isolated from the workplace. Questions about the setting for intuition include:

What settings do other types of jobs and job holders experience?

Do settings differ by field or level of experience?

Is the experience of CEOs and others who react to proposals similar to Marty's who intuitively rejected one plan and simultaneously generated another?

How does employing intuition in the type of situation Marty experienced differ from access in other settings?

Actions to access intuition

Except at the broadest levels, this study did not sequence people's actions to access intuition. Nor did it attempt to delineate the interrelations among individuals' actions. For example, I did not determine whether reading is a subset of searching although it does seem one type of search. Such an analysis, especially by type of problem solved, would be very useful. The investigation might be approached either through using a larger, more comprehensive sample or an in-depth case study that extended over time. Based on my experience in this study, I would recommend additional qualitative research and suggest in-depth case studies to gather data to build theories which could then be verified through other means. Relying on the journal data alone would have provided different results in

this study. The presence of a trained investigator helped elicit more information than would have been available from the journals alone. Additionally, participants' voice levels and nonverbal communications helped me understand their meanings and provided fuller responses.

Specific questions on what to address include:

Is there a specific sequence of events people use when they access intuition?

What is the relationship between the specific actions?

Are some reported actions more general searching activities while others are subsets of these activities?

How and for what purpose do people listen at the moment of intuition?

Are there specific interventions that human resource developers can design to enhance people's ability to listen for intuition?

What is the relationship between the actions identified in this study and the techniques suggested for enhancing the use of intuition that have been suggested by Agor (1986), Vaughan (1979), Davis (1973) and others?

Is there a difference in the nature or sequence of actions to access intuition based on whether or not a person is a novice, a competent performer, or an expert (Dreyfus and Dreyfus, 1984)?

Strategies, tactics, and tacit processes

While I explored the relationship between strategies, tactics, and tacit processes, I was more interested in identifying their presence or absence than in classifying them. A clear differentiation seems difficult because of the factors of intentionality and implicitness woven through people's actions. Further analysis might be elucidating. Questions to investigate include:

Can people learn to recognize tacit processes and the signal of impending intuitions?

Once people acknowledge the tactics they use, can they employ these tactics at will—transforming tactics into strategies?

Do individuals move from an acknowledgement of the existence of intuition towards greater ability to use strategies or tactics to access it?

Would changing beliefs affect the use of intuition?

The relationship between values, beliefs, and actions

What is the relationship between acknowledging intuition's use or value and being able to discuss or control its use? What are the beliefs of adults vis-a-vis intuition and its presence? These are also key research issues. All but one of the study participants reported that they relied on intuition to some degree. Many heeded their intuition in most circumstances and four trusted it absolutely. Certainly participants' belief in the existence of intuitions and the proprietariness of intuition's role in problem solving as, for example, an idea generator, enabled them to discuss the dynamics of accessing intuition. Yet, these people were chosen to participate in the study because they were considered likely candidates to be able to articulate on intuition and problem solving. Others may not be as aware of intuitions or how to access them. Still others may be more aware and be able to provide more data. An investigation into the values and beliefs of those in other sectors of the workplace, as well as the interrelationship of values, beliefs, and actions vis-a-vis intuition, will be valuable to devising ways to enhance people's ability to access intuition.

Joint efforts

The areas of research listed here are not meant to be all encompassing. They are the ones that seem logical extensions of this study. Other researchers will see different aspects as more significant. For the field, however, what might be most important is the combining of efforts by interested individuals and institutions to pool knowledge and resources. The International Management Institute of Geneva, Switzerland, seems to be taking a leadership role in this process. In 1989, it conducted an international survey on the use of intuition by business managers. The institute is also a cosponsor of the Intuitive

Leadership Project at the Hubert H. Humphrey Institute of Public Affairs along with the Institute of Noetic Sciences and the Charles I. Kettering foundation. Such joint efforts are likely to create more progress sooner than any individual project.

Practice

Given the great research needs referred to above, what implications do study results have for practitioners? The short answer is: Become involved. While much is unknown about intuition and how to access it, more information is available than is supposed. Practitioners wishing to help people access intuition may be under the illusion that both they and the adults they work with are unable to better use intuitions because these are products of the mind's hidden processes. This is not so. However, the implicitness of intuition does block people from extending their awareness of the processes that surround it (Fischbein, 1987). People find thinking about thinking difficult. But, as this study and others indicate, people can do it and, in the process, learn more (Benderley, 1989).

I had begun this study searching for a set of strategies and tactics that I could use as the basis of training programs. I also intended to gain some insight about the types of organizational structures that would enhance accessing intuitions. I learned neither. Instead, I finished convinced that human resource development practitioners' role in this arena is to link adults in the workplace with current and emerging research on intuition and to champion adults' individual exploration with their own thinking processes. Some specific ideas follow.

Participate in joint efforts

To succeed, researchers in the field need the support of practitioners in the workplace. Laboratory studies can only go so far in simulating workplace situations and in identifying how people access their intuition on the job. Practitioners can actively participate in this work by conducting research themselves, by participating as subjects or co-researchers, by suggesting topics to explore, or by making settings accessible for research. Such endeavors would broaden practitioners' knowledge about intuition and link them to available resources for exploring it. Possible joint research areas include the use of listening as a way to access intuition, accessing intuition while with others, and employing intuition when solving workplace problems. Opportunities for creating networks of inquiry abound. Identified groups with specific interest in this topic now include: American Society of Training and Development, Brain Trainers' Network; National Society for Performance and Instruction, Human Possibilities Track; the Hubert H. Humphrey Institute of Public Affairs; the International Management Institute; and the Institute of Noetic Sciences and the Association for Transpersonal Psychology.

Create settings for individual explorations

We in today's workplace are very busy and constantly on the run. Most of us do not have adequate time to complete required tasks, much less to reflect on the processes used to perform those tasks. Yet such reflection is an integral part of the learning process and helps individuals succeed and even improve in the future. A number of the participants in this study found their involvement in the study process enlightening. By examining what they had done, participants were able to make some of the implicit explicit. For

example, Dana “realized” that she had in her mind a scaffold or superstructure of knowledge that contained information about her readers, the field, and her organization and that she scanned this grid in deciding on topics. Bill identified additional situations where he used intuition to “sense” problems. Sharon discovered that listening was a key action in her accessing of intuition. She also decided to improve listening skills. Finally, Marty was intrigued to know that he could always find reasons to “rationalize” his intuitions. Because of intuition’s tacit nature, this process of self-discovery may be particularly important in enhancing people’s ability to access it.

A key part of establishing settings for individual exploration is sharing existing information about intuition and its use in problem solving. Harman and Rheingold (1984) agree that psychological safety and freedom of expression are important precursors to accessing intuition. Fischbein (1987) notes that because they use tacit processes to arrive at intuitions, people are particularly resistant to examining their reasoning. Thus, the task of self-reflection is not easy. However, it seems a growth, no growth decision.

Recognize different settings and unexpected actions at the moment of solution

Reading the body of literature on intuition and studying participants’ statement, I came to realize that a major constraint in people’s ability to understand or access intuition is their own conception of what intuition is and how it occurs. Letting go of old ideas and grasping new ones is a challenging task. And that is what happens at the moment of solution—the new idea or concept grasps the thinker wholly and with certainty. The old concept dissipates. One of the problems many practitioners may face in moving ahead in understanding intuition is letting go of existing models of thinking and problem solving.

Many who have focused on the issue of intuitive processing are likely to view it as solitary effort. They are likely to believe intuitions come alone and usually not in the workplace. They hold in their minds images of such thinkers as Archimedes, Einstein, Howe, Poincaré—whose intuitions occurred when they were alone and in moments of repose. Yet, as Goldberg (1983) points out, the process of intuition may differ from people's conception of it. In this study the predominance of listening as an action to access intuition and the high number of people who were not alone support Goldberg's contention. The presence of these findings alert us to the need to look afresh at the intuitive process. Maybe people don't identify the actions that access intuition simply because they do not expect to use intuition!

Focus on analysis

A number of participants in this study who addressed the relationship of analysis to intuition reported that they used analysis to implement their intuitions, not to judge them. Such a practice can lead to errors (Nisbett and Ross, 1980). Sometimes people may be judging two unlike situations to be similar. They might also be making decisions based on too small a sample size. Efforts to help people to develop critical thinking skills and to use those skills to analyze intuition will result in two outcomes. People's intuitions will be less susceptible to error, and, because of this, their level of confidence, and subsequent use of intuition, is apt to grow.

This focus on analysis might appropriately reflect the complementariness of intuition and analysis discussed by study participants and others. As Simon (1987) points out:

It is doubtful that we will find two types of managers (at least of good managers), one of whom relies almost exclusively on intuition, the other on analytic techniques. Most likely, we will find a continuum of decision-making styles involving an intimate combination of the two kinds of skill. We will likely also find that the nature of the problem to be solved will be a principal determinant of the mix (p. 61).

Pursuing more deeply the relationship between actions to access intuition and analytical techniques will help provide additional data to enhance people's ability to solve problems. By focusing on the relationship of actions to the nature of the problem to be solved, practitioners may be able to more closely link problem-solving strategies to specific types of tasks.

The Last Word

Westcott (1968) ended his landmark study *Toward a Contemporary Psychology of Intuition* with the comment that, "the last word on intuition is as far in the future as the first word on intuition is in the past." Goldberg (1983) echoed Westcott's sentiment. I am tempted to add my voice to the refrain. I agree that what we can articulate about intuition is minute compared to what we will eventually be able to make explicit. However, I expect that by building on the base laid by Westcott (1968), Goldberg (1983), Fischbein (1985), and others, researchers will be better able to create a framework for study and investigation than previously has been imagined. Such a framework can link and integrate knowledge from different fields, speeding the discovery process. Accelerating factors include

movement into a “knowledge” age with its great amounts of data accessible and waiting to be digested, the increased understanding of human processes being gleaned from multiple disciplines, and the computer technology that can link individuals to information and to other seekers.

Yet, I believe the most powerful fuel for reaching an increased understanding of how to access intuition will be people’s curiosity. Propelled by an “itch” to know how they think and with the belief that they can understand and direct their own mental action, people may act as Nayak’s committed problem solvers do and seek solutions until breakthroughs occur. Human resource development researchers and practitioners not only have a stake in this search, but have an opportunity to help lead it.

References

- Agor, W. H. (1986). The logic of intuitive decision making: A research based approach for top management. Westport, Ct.: Greenwood Press.
- Bastick, T. (1982). Intuition: How we think and act. New York: Wiley and Son.
- Benderley, L. B. (1989). Everyday intuition, Psychology Today, 23 (9), 35-40.
- Brown, G. W. & Wolf, J. S. (1986). Development of intuition in the gifted. Journal of Education of the Gifted, 9, (2), 157-164.
- Bruner, J.S. (1973). Beyond the Information Given. New York: Norton.
- Bruner, J. S. & Clinchy, B. (1966). Towards a disciplined intuition. In J. S. Bruner (Ed.), Learning about learning (no. 15). Bureau of Research (Cooperative Research Monograph).
- Catford, L. (1987). Creative problem solving in business: Synergy of thinking, interacting, sensing and feeling strategies. Unpublished doctoral dissertation, Stanford University, Connecticut.
- Chinen, A. B., Spielvogel, A. M., & Farrell, D. (1985). The experience of intuition, Psychological Perspectives, 16 (2), 186-197.
- Churchman, C. W. (1971). The design of inquiring systems: Basic concepts of systems and organizations. New York: Basic Books.
- Condon, T. (1987). Expanded Intuition Training. Berkeley, CA; The Changeworks.
- David, James (1982). Short-term training of college composition students in the use of free-writing and problem-solving heuristics for rhetorical invention: A comparative evaluation. (Doctoral dissertation, Kent State University, 1982). Publication number AAC8221554.
- Davis, G. (1973). Psychology of problem solving: Theory and practice. New York: Basic Books.
- Dreyfus, H. L. & Dreyfus, S. E. (1984). Putting computers in their proper place: Analysis versus intuition in the classroom. Teachers College Record, 85 (4), 578-601.
- Ericsson, K. A. & Simon, H. A. (1984). Protocal analysis: Verbal reports as data. Cambridge: MIT Press.

- Fischbein, E. (1985). Intuition and intellectual education. In Torsten, H., Postlethwaite, T. N. (Eds.) International Encyclopedia of education, Volume 5, Oxford: Pergamon Press.
- Fischbein, E. (1987). Intuition in science and mathematics. Dordrecht, Holland: D. Reidel Publishing Company.
- General Accounting Office (1987). Case study evaluations. Washington, D.C.: U.S. General Accounting Office.
- Gerber, M. M. (1983). Learning disabilities and cognitive strategies: A case for training or constraining problem-solving? Journal of Learning Disabilities, 16 (5), 25-26.
- Glaser, B. G. & Strauss, A. L. (1967). The Discovery of Grounded Theory. Chicago: Aldine.
- Goetz, J. P. & LeCompte, M. D. (1984). Ethnography and qualitative design in educational research. Orlando, Fl.: Academic Press.
- Goldberg, P. (1983). The Intuitive edge: Understanding and developing intuition. Los Angeles: Jeremy P. Tarcher.
- Greeno, J. G. (1978). Natures of problem-solving abilities in W. K. Estes (Ed.) Handbook of learning and cognitive processes (Vol. 5), 239-270. Hillsdale, N. J.: Lawrence Erlbaum Associates.
- Harman, W. & Rheingold, H. (1984). Higher creativity: Liberating the unconscious for breakthrough insights. Los Angeles: Jeremy B. Tarcher.
- Herrmann, N. (1982). The creative brain. Training and Development Journal, 35 (10), 11-16.
- Hofstadter, D. S. & Dennett, D. C. (1981). The Mind's I. New York: Basic Books.
- Holsti, O. R. (1969). Content analysis for the social sciences and humanities. Reading, Mass.: Addison-Wesley.
- Isaack, T.S. (1978). Intuition: an ignored dimension of management. Academy of Management Review, 3 (4), 917-921.
- Isaack, T.S. (1980). Intuition: a treasury of knowledge. Personnel Administration, 25 (7), 74-78.
- Isenberg, D.J. (1984). How senior managers think. Harvard Business Review, 62 (6), 80-90.

- John-Steiner, V. (1985) Notebooks of the mind. Albuquerque, N.M: University of New Mexico Press.
- Kitchener, K. S. (1983). Cognition, metacognition, and epistemic cognition. Human Development, 26 (4), 222-232.
- Kuhn, T. S. (1970). The structure of scientific revolutions (Second edition, enlarged). Chicago: University of Chicago Press.
- Luconi, F. L., Malone, T. W. & M. S. Scott Morton, (1986). Expert systems: The next challenge for managers. Sloan Management Review, Massachusetts Institute of Technology, 27 (4), 3-14.
- Markley, O.W. (1988). Using depth intuition in creative problem solving and strategic innovation. The Journal of Creative Behavior. 22 (2), 85-100.
- Merriam, S. B. (1988). Case study research in education. San Francisco: Jossey-Bass.
- Miles, M. B. & Huberman, A. M. (1984). Qualitative data analysis: A sourcebook of new methods. Newbury Park, Calif.: Sage.
- Mintzberg, H. (1976). Planning on the left side and managing on the right. Harvard Business Review 54 (4), 49-58.
- Moskol, A. E. (1980) An exploratory study of the processes that college mathematics students use to solve real-world problems. (Doctoral dissertation, University of Maryland, 1980). Publication No. AAC8104963.
- Nayak, P. R. (1989). Presentation at American Society of Training and Development, National Conference. June, Boston.
- Nayak, P. R. & Ketteringham, J. M. (1986) Breakthroughs. Rowson Associates, N. Y.
- Newell, A. & Simon, H. (1972). Human problem-solving. Englewood Cliff, N.J.: Prentice Hall.
- Nisbett, R. E. & Ross, L. (1980). Human inference: Strategies and shortcomings of social judgment. Englewood Cliffs, N.J.: Prentice Hall 1980.
- Noddings, N. & Shore, P. (1984). Awakening the inner eye: intuition in education. Wolfeboro, New Hampshire: Teachers College Press.
- Palmer, Helen. (1988). Presentation at Opening the Intuition Gate, a conference to explore the role of intuition in psychotherapy. Jan. 28-31, San Francisco.

- Parikh, J. (undated). Mimeographed research project proposal to the International Management Institute, Geneva, Switzerland.
- Patrick, C. (1937). Creative thought in artists, Journal of Psychology, 4, 35-73.
- Perkins, D. N. (1981). The mind's best work. Cambridge, Mass.: Harvard University Press.
- Rockenstein, Z. (1988). Intuitive processes in executive decision making. The Journal of Creative Behavior, 22 (2), 77-84.
- Silverman, B. G. (1985). Expert intuition and ill-structured problem-solving. IEEE Transactions on Engineering Management, EM-32 (1), 29-33.
- Simon, H.A. (1987). Making management decisions: The role of intuition and emotion. Academy of Management Executives, 1 (1), 57-64.
- Simonton, D. K. (1980). Intuition and analysis: A predictive and explanatory model. Genetic Psychology Monographs, 102 (1), 3-60.
- Sinnott, J. D. (in press). Lifespan relativistic postformal thought: Methodology and data from everyday problem-solving studies. In M. Commons, J. Sinnott, F. Richards, & C. Armon (Eds.), Beyond formal operations II: Comparisons and applications of adolescent and adult developmental models. New York: Praeger.
- Vaughan, F. E. (1979). Awakening intuition. New York: Doubleday.
- Westcott, M. (1968). Toward a contemporary psychology of intuition. New York: Holt, Rinehart and Winston.
- Westcott, M. (1984). Intuition. In R.J. Corsini (Ed.), Encyclopedia of psychology, (Vol. 2), 251-254. New York: John Wiley & Sons.

APPENDICES

APPENDIX A

Participant Instruction Booklet

Welcome to our project!!

This project is a study to find out about the specific actions people take to access their intuition to solve problems. You will participate by identifying one or more complex problems which you used your intuition in solving, and by describing the problem, the intuition that occurred and the actions you took at the moment or just before you arrived at an overall solution to the problem (or a sub-problem).

After completing the journal, you will have an opportunity to provide more information about the problem(s) you described as well as discuss other instances where you used intuition in problem solving in a sixty to ninety minute interview.

After your journal and interview have been typed and transcribed, and after I have written a narrative summary of the instance(s) you describe, I would appreciate your reviewing the transcriptions and summary to ensure accuracy and to provide clarification.

Finally, after the study is complete, you will have an opportunity to meet with other participants or co-researchers, to hear and discuss study results, as well as your own learning during the experience.

Timing and Time Span

Expect to spend a minimum of forty-five minutes to one hour describing each problem-solving instance you include. Within two to three weeks of our initial

meeting, I will call to set up an interview. I will provide the transcriptions to you with the narrative summary as soon as possible after that interview.

While I hope to have all data collected and recorded by early summer, I expect analysis and interpretation to be an in-depth and lengthy process. Thus, our final meeting will probably not be held until next Winter or Spring.

This Booklet

This booklet contains:

- some definitions that will be useful as you write in your journals.
- "Record of Events." This record will constitute your journal. It provides a framework for you to describe the strategies and tactics you use to access your intuition. The questions included are intended as guideposts and prompts.

Contact

If you have any questions or concerns, or would like to discuss potential instances to describe, please call Linda Morris at work or at home:

648-2306	Work
860-3785	Home

Definitions

Intuition

Webster's dictionary defines intuition as the "act of knowing without the use of rational process: immediate cognition, knowledge applied by the use of the faculty, acute insight."

Efraim Fischbein classified intuitions into affirmatory and problem solving, and termed problem-solving intuitions as *anticipatory* or *conclusive*. Anticipatory problem-solving intuitions occur when a problem solver has a global view of the solution and a feeling that it has been reached, but has not yet completed an analytical detailed solution. This is the kind of intuition we are investigating.

Complex problems

Intuition is thought to play a role in complex problems. These are problems which have no single solution and are:

- ill-defined
- not easily solved by immediate application of well-known procedures or rules
 - apt to be in "cutting edge" or "frontiers of knowledge" areas
 - solved without an opportunity to get "all the facts"

Record of Events

For each instance you select, please provide information about the type of problem you addressed, the intuition you experienced and the strategies you used to access the intuition. Use the discussion points and questions as guideposts for your journal entry. In some cases your responses may fall into more than one category. If so, indicate multiple responses and explain your situation.

Be creative, use pictures, graphs, charts, words, etc. to present your ideas. If you need more space, use additional pages.

The Problem

Describe the problem or sub-problem you solved.

1. What was the nature of the subject matter: a) program design; b) financial management; c) resource allocation; d) long or short range planning; e) policy question; f) other? Explain.
2. Please provide your view on the nature of the problem. Address all three issues. Was the problem simple or complex? Were there multiple answers? Was there one "right" approach? Explain.
3. For you, your organization, or both, was the situation or subject matter: a) extremely important; b) very important; c) moderately important; d) not very important; e) trivial? Explain.
4. Were you under pressure to make up a decision or come up with an answer because of time or any other factor?
5. For you, your organization, both, or others, did the problem solution represent: a) a great risk; b) a moderately high risk; c) some risk; d) not much risk? Explain.

The Intuition

Describe the specific intuition that occurred aiding your solution to the problem.

1. Was the intuition primarily: a) auditory (you heard something); b) visual (you saw something); c) kinesthetic (you felt something); d) symbolic; e) just a faint idea; f) an inner dialog; g) other. Explain.
2. What was your initial reaction to the intuition: a) skepticism; b) rejection; c) reserved judgment; d) hesitation; e) relief; f) joy; g) certitude; h) other? Explain.
3. Was it: a) a quick flash; b) a prolonged experience; c) very clear; d) vivid; e) somewhat clear; f) hazy? Explain.
4. Did the intuition return to you at various times? When? How often? Did you expand on it? Explain.
5. Did you analyze it? Did you gather information to support and/or refute it? Explain.

Your Actions

Describe the specific actions you were engaged in at the moment or just before the overall problem solution occurred?

1. What were you doing when and immediately before the intuition occurred?
2. Were you actively engaged in solving the problem? Explain.
3. Did you intentionally take some action to access your intuition? What did you do?
4. Did you have some signal or clue that an intuition might occur? What was it?

APPENDIX B

Interview Questions

1. Tell me more about the problems you wrote about in your journal. How did the situations work out? Was the intuition verified by experience or was it refuted? In retrospect, would you do anything differently?
2. Are the situations described here typical of your experiences using intuition in problem solving? Are there additional strategies you use or different types of experiences you think it's important to describe?
3. Do you always listen to your intuition? Do you ever turn it down? When? Why?
4. Are there circumstances when you acted on intuition and were wrong? What were the conditions/characteristics of those situations?

APPENDIX C

Consent Form

Strategy Identification Project

Virginia Tech

1989

The purpose of this study is to identify strategies we use to access intuition as we solve problems. As a participant you are asked to identify three to five complex problems in which you used your intuition to solve, and to provide information about the strategies you used to access your intuition.

You will participate in the study as a co-researcher, describing your three to five problems in a journal, and also participate in an interview. These activities will take place over a three to six week period. You will also be asked to provide feedback on the researcher's discussion and interpretation of the research at the study's conclusion.

Participation in this study is voluntary and you may discontinue your involvement at any time. Individual privacy will be maintained in publication of any data resulting from the study.

If you have any further questions, please contact me, Linda Morris, at 703/648-2306.

Signed _____ (Participant)

_____ (Researcher)

Date:

VITAE

LINDA E. MORRIS

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Personal Data:

Birthdate: May 30, 1943
Birthplace: Winchester, MA
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Present Position:

Director, Industry Services Education, National Professional
Development Group, Ernst & Young

Education:

Virginia Polytechnic Institute, 1983 - 90; Ed.D., Adult Education,
Human Resource Development Specialty
Dissertation: Strategies and Tactics to Access Intuition: A Look at the
Moment of Solution
Virginia Polytechnic Institute, 1980 - 83; M.S., Adult Education,
Human Resource Development Specialty
Regis College, 1960 - 64; B.A., History

Professional Experience:

- 1990 - Director of Industry Services Education, Ernst & Young
- 1986 - 90 - Director, Industry/Education Methods Department,
Arthur Young
- 1983 - 86 - Director, Education Methods, Arthur Young
- 1981 - 83 - Education Methods Specialist, Arthur Young
- 1978 - 81 - Self-employed, Writer/Editor
- 1972 - 75 - News Reporter, Reston Times
- 1968 - 69 - Researcher/Writer, National Education Association
- 1964 - 66 - Teacher, U.S. Peace Corps, Cameroon, W. Africa

Professional Memberships:

American Society for Training and Development

- 1990 Research Committee Liaison to Publishing Review
 Committee
- 1989 - 92 Member, National Research Committee
- 1988 - 90 Director, Brain Trainers' Network
- 1986 - 88 Director Elect, Brain Trainers' Network
- 1985 - 90 Founding member, leader in Brain Trainers' Network
- 1982 - 90 Member

National Society for Performance and Instruction

- 1987 - 1990 Member

Papers, Presentations, and Publications:

1989

Morris, L. Sharpening Intuitive Strategies to Meet the Challenge of the 90s. Presentation at the National Conference of the American Society for Training and Development, Boston, MA, June 4, 1989.

Morris, L. Accessing Intuition. Presentation at ASTD Meeting, Greensboro, NC, October 3, 1989.

Morris, L. Strategies and Tactics to Access Intuition, Presentation at a symposium for the Center for Creative Leadership, Greensboro, NC, October 4, 1989.

Morris, L. (1989) "Useful Tool or 40-Pound Paperweight". Article in the Journal of Training and Development, (September), pp. 80 - 84.

1988

Morris, L. Introduction to Intuitional Data Gathering. Panel presentation at National Society for Performance and Instruction, Washington, DC, April 8, 1988.

Morris, L. Intuition and Problem Solving. Presentation at the National Conference of the American Society of Training and Development, Dallas, TX, May 24, 1988.

1987

Morris, L. Intuition and Problem Solving. Presentation at Third Beyond Formal Operations Symposium, Harvard University, Cambridge, MA, June 26, 1987.

1985

Morris, L. (1985) "Adult Learning: A Brief Overview" in Leibowitz, Z. and Lea, H.D. Adult Career Development: Concepts, Issues and Practices. American Association for Counseling and Development, Alexandria, VA.

1982

Holm, J. (1982) Women in the Military. Presidio Press; Novato, CA (Editor and Consultant).

1971

Morris, L. (1971) The National Commission on Teachers Education and Professional Standards, The Encyclopedia of Education. The MacMillan Company and the Free Press.

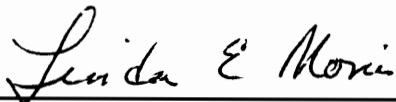
Awards and Certificates:

Role Model ASTD Models for Excellence Study, (Program Designer, Manager), 1990.

Certificate of Recognition. MIT Management in the 1990s Research Program, Sloan School, 1989.

ASTD Council of Networks. National Leadership Award, 1988.

Role Model ASTD Models for Excellence Study (Program Designer, Instructional Writer), 1985.



Linda E. Morris