

The Art of Solving Problems: Comparing the Similarities and Differences
Between Creative Problem Solving (CPS), Lateral Thinking and Synectics

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The Art of Solving Problems: Comparing the Similarities and Differences
Between Creative Problem Solving (CPS), Lateral Thinking and Synectics

by

David González

A Project for Studies in Creativity

Submitted in Partial Fulfillment of the Requirements of the Degree of

Master of Science

State University of New York – Buffalo State College
International Center for Studies in Creativity

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ABSTRACT □

The Art of Solving Problems: Comparing the Similarities and Differences Between Creative Problem Solving (CPS), Lateral Thinking and Synectics

This project compared and contrasted three popular, cognitive creative problem solving methods – Synectics, Creative Problem Solving (CPS) and Lateral Thinking. A qualitative research design compared each method across focused and differentiated dimensions of analysis. The dimensions of analysis were philosophical, theoretical, structural, functional and efficacy. This study was conducted in order to provide an objective base of data that clearly indicates the strengths and weaknesses of each method in relation to each dimension of analysis. Specific criteria, organized within each dimension of analysis, were used to break-down each method and then to make comparisons across.

Despite differences in language and levels of abstraction among the three methods, the study highlighted the similarities and key differences among these methods, indicating that it is not possible to rank each of these methods against each other in hopes of selecting one ‘global’ winner. The study illustrates that there is a time and place for each method, and the more thorough the understanding we have of each of these methods the better chances we have of designing successful interventions. Last, this project discussed the need for more collaboration in the field of creativity and breaking up ‘us-against-them’ mindsets.

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Dates of Approval:

David González, Candidate

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International Center for Studies in Creativity

DEDICATION

The following Master's Project is dedicated to my parents, Lidia and Carlos González, who never had the opportunity to study, let alone finish junior high school. I hope that you may live vicariously through the pages that follow...for they are a representation of you. Gracias por todo Mamá y Papá. Los quiero mucho. I wish to also dedicate this Project to my brother Dennis who has consistently intoxicated my life with his creative juices, genuine nature and brotherly love. ¡Gracias pibe!

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SECTION 1

The Challenge

INTRODUCTION

The purpose of this project was to compare and contrast three popular, cognitive creative problem solving methods – Lateral Thinking, Synectics and Creative Problem Solving (CPS). Specifically, the intent was to compare the three methods against focused dimensions of analysis. These dimensions of analysis were philosophical, theoretical, structural, functional and efficacy. Specific criteria were generated for each dimension of analysis to help explore the similarities and differences among the methods.

RATIONALE & SIGNIFICANCE FOR PROJECT

During the first semester of my study in creativity, I realized a gap existed in communicating the similarities and differences of some of the most well-known and utilized creative problem solving methods. I had also begun to notice an ‘us-against-them’ mentality among creativity practitioners that I believed was holding back the field of creativity. I felt that a simple, yet thorough communication of these similarities and differences would grant individuals within the field of creativity much-needed perspective and understanding. A year later, and after an in-depth academic training and creativity conference tour across the United States, I knew my hypothesized gap held more than face validity. Creativity is a field of study that has been plagued by fractionalized efforts and ‘us-against-them’ mindsets where many have ignored existing work in the field and opted rather to take on the ‘lone wolf’ image and work in isolation. The degree of collaboration, networking and conceptual understanding among professionals in the field of creativity has long been a concern (Murdock, Isaksen, Vosburg, & Lugo, 1993).

In regard to creativity programs and models, Stein (1993) has noted that there is merit in comparing different creativity programs so that we can learn which is most effective. There are numerous comparisons among various creative problem solving methods (McPherson 1968; Wright 1999; Parnes, 2000), yet few have provided an evaluative comparison that goes beyond that of steps, phases, and tools and techniques. This study addressed the need for more thorough comparative data in regard to the Creative Problem Solving (CPS), Synectics and Lateral Thinking creative problem solving methods. To date, no such heuristic framework has been created in order to critically and objectively review and compare these three popular methods against focused criteria. I felt it was important to bridge several data gaps in the creativity literature and provide much-needed perspective to those creativity ‘lone-wolfs’ who live and will die in isolation. I hope that this study will formally bring closure to the

misperceptions surrounding these methods and act as a springboard to help initiate more investigation, collaboration and unity among individuals in the field of creativity. I also look forward to the day that this study might impact curriculum design and widen the scope of content delivery at the International Center for Studies in Creativity in Buffalo, NY. This is my contribution to the field of creativity and trust that it serves future researchers, practitioners and educators in whatever way possible.

RATIONALE FOR SELECTED METHODS

Although there is a large amount of change and creative problem solving methods before us in today's society, I chose to compare only a select few. Before providing the rationale for my selection, I will first explain how I chose to define 'creative problem solving method' in the context of this project, and in particular, the reasoning behind electing to utilize the word 'method' versus 'model'. As it pertains to the context of this Project, creative problem solving methods are methods that allow an individual to solve ill-structured problems or any situation where an individual is seeking new or original ideas. These non-conventional methods provide the problem solver an opportunity to realize novel and useful solutions to complex problems that may not have been solvable by logical thinking. There has always been some debate as to whether or not something should be described as a method or model. It can also be argued that a model typically falls within a method. In other words, all methods contain a model. As defined by Webster's Ninth New Collegiate Dictionary, model is a miniature representation of something. A description or analogy used to help visualize something. Method is defined by the same source as a systematic procedure, technique, or mode of inquiry employed by or proper to a particular discipline. A systematic plan followed in presenting material for instruction. Since the focus of this project was to move far beyond just a visual representation of the creative problem solving methods in question and dig deep into philosophical, theoretical, structural, functional and efficacy constructs, the word 'method' was chosen to allow for a more holistic approach to the analysis.

I used three specific criteria to select these three creative problem solving methods. The first two criteria were that all three methods needed to: (1) be cognitively-based; and (2) have an adequate amount of literature to review. The third criterion was that after an exhaustive creativity conference tour across the country, I believed that these three methods were the most popular among creativity practitioners and educators. This tour of conferences included two Creative Problem Solving Institutes (1999, 2000) hosted by the Creative Education Foundation, the American Creativity Association conference (2000), and Convergence 2000, which is produced by the Innovation Network. Having attended over 50 different workshops and familiarizing myself with many of the top creativity practitioners, it became obvious that CPS, Lateral Thinking and Synectics were among the most utilized creative problem solving methods.

PROJECT PURPOSE

The purpose of this project was to compare and contrast three popular creative problem solving methods against focused dimensions of analysis and criteria to support each dimension. The dimensions of analysis included philosophical, theoretical, structural, functional and efficacy measures. The three methods analyzed were Creative Problem Solving (CPS), Lateral Thinking and Synectics. It was intended that the findings of this project would help to bring about more collaboration among creativity practitioners and decrease the existing 'us-against-them' mentality. This study provides an objective base of data that clearly indicates the strengths and weaknesses of each method in relation to the dimensions of analysis and how they match up against each other. The project laid forth final suggestions and recommendations based on the findings of the analysis and these recommendations may serve as a springboard from which to analyze future methods. Although this project specifically compared CPS, Lateral Thinking and Synectics against each other, the dimensions of analysis may serve future students and practitioners as a framework from which to build upon and compare other methods.

PROJECT QUESTIONS

The questions that guided this project were:

1. What are the key philosophical, theoretical, structural, functional and efficacy dimensions that comprise the CPS, Lateral Thinking and Synectics creative problem solving methods?
2. In what ways are these methods similar and/or different based upon these comparative dimensions?
3. How might an evaluative comparison of these methods benefit practitioners?

SUMMARY

This section provided an introduction to the project, including the rationale for the project, project questions to be explored, and the methods (CPS, Lateral Thinking and Synectics) that will be compared. Section 2 presents the methodology and procedures that were used to compare the three methods. Section 3 describes the results and findings of the analysis and Section 4 compares these three methods across each dimension of analysis, including specific strengths and areas of opportunity for each method. Section 4 concludes with a summary of key learnings, implications and recommendations.

SECTION 2

Methodology

INTRODUCTION

Section 1 introduced the project, presented the rationale for the project and rationale for the selected methods, and articulated the project purpose and questions. Section 2 highlights and defines the specific types of analysis that were utilized to compare the three methods and the sources of data from which the findings were drawn. In addition, this section focuses on the methodology utilized, the rationale for its design and explains its importance to the project.

RATIONALE FOR THE METHODOLOGY

The purpose of this project was to compare and contrast the similarities and differences of the CPS, Lateral Thinking and Synectics creative problem methods. Specifically, the intent was to compare and contrast these methods against focused dimensions of analysis, which were philosophical, theoretical, structural, functional and efficacy. Given this purpose, it was necessary to design a methodology that could be applied to analyze systematically each method and make comparisons across the three methods. Initially, it was thought that the methodology to be utilized to analyze these methods would be Creative Analysis. Mance (1996) and Pelletier (2000) proceeded me by utilizing Creative Analysis to compare CPS against other problem-solving methods. After analyzing Mance and Pelletier's studies, I felt Creative Analysis would not serve my purposes because it would have limited me to a structural analysis. Although Creative Analysis influenced the overall qualitative research design, an original methodology was designed so that I could take a much broader approach in extracting and sorting the information I sought.

DESCRIPTION OF THE METHODOLOGY

In designing the research methodology for this project, it was imperative that I zero in on key dimensions of analysis that would provide a holistic view, yet allow for investigation into the specifics of the structure and function of each method. I wanted to communicate what makes each method stop and go, from the broadest levels of abstraction down to a more focused look at the details of each method. The framework that would allow for such a comprehensive analysis involved five dimensions of analysis: philosophical, theoretical, structural, functional and efficacy. The reasons for selecting these dimensions of analysis were as follow:

Philosophical:

I felt it was important to provide some history and background for each method, and in particular, why and how each method originated. Understanding the why and how of these methods is vital in terms of understanding the motivations, beliefs, values and assumptions of those individuals behind each method's construction. It is critical to feel the 'soul' of things in life and this dimension allows one to do so. As the saying goes... *"for without a soul there is just a shell"*.

Theoretical:

Life reminds us time and time again that we must delicately balance the beautiful relationship between application and knowledge. Applied knowledge is wisdom. Successful application relies on and is a result of thoroughly understanding what resides below the surface of anything, and in this case, a method or phenomenon. From an operational standpoint, it is necessary to understand the fundamental principles behind each method. This dimension provides an individual with the knowledge to realize what makes each method stop and go. This dimension gets to the heart of matters and explains how each method operates and what exactly operates it.

Structural:

I included this dimension to provide a birds-eye-view of all the parts that make up each method. I thought it was critical to familiarize the reader with the architecture and internal 'guts' of these methods. Seeing the breakdown between a method's parts, components, stages, phases, tools, techniques and vocabulary, will clarify the manner of organization and construction of the whole.

Functional:

This dimension was included because it is imperative to understand the natural activity that is expected to happen in order for each method to perform. We need to understand all of the requirements such as roles, responsibilities, procedures, expectations, training, universality of application, learning, and other 'logistical' and functional types of activities in order for the method to be useful.

Efficacy:

So what? Does it work? Says who? Who's using it? Does it make a difference? Because of the lack of information and research in this area, all three methods were reviewed jointly and this analysis appears in Section 4.

To ensure that there would be no overlap in the information elicited from the five dimensions, it was critical that I clearly define each dimension of analysis and ensure substantial differentiation between them. The definitions were developed and 'defined' after reviewing and highlighting the commonalities between the definitions from five different dictionaries. The definitions were as follow:

Philosophical

Logical analysis of the assumptions, beliefs and values underlying the conduct, thought, knowledge and nature of a phenomenon.

Theoretical

General principle or set of principles formulated to *explain the operation* of the phenomenon. Plan as to how the phenomenon works.

Structural

Arrangement or interrelation of all the parts of the whole. Manner of organization or construction of the whole.

Functional

Natural or required activity that is expected. How the method intends to perform and be useful.

Efficacy

Power to produce intended results

Once the dimensions of analysis were clearly defined, I then generated data-finding questions that would allow me to thoroughly extract necessary data to respond to the larger question each dimension was asking. The questions that were generated and helped to guide the project were as follow.

Philosophical

- Where and when did this phenomenon originate?
- Who originated it?
- Why did it originate?
- How did it originate?
- Is it connected to other families of methods or is it unique?

Theoretical

- What are the principles that propel the method?
- How and why do the principles allow the method to work/perform?

Structural

- What are the parts?
- What are the stages?
- What are the phases?
- What are the tools?
 - Tools to support each of its purposes?
 - Unique tools? Multipurpose tools? Special-purpose tools?
- Key vocabulary/language?

Functional

- What is expected to happen in order for the method perform?
- Who must be involved (individual, group or both)?
- Roles, procedures, responsibilities, expectations?
- Does it require prior learning and expertise to effectively apply?
- Is method universal and applicable across multiple contexts?

Efficacy

- Availability of empirical research?
- Cost effective?
- Who is using the method?
- Degree of complexity in application? Facilitator? Client? Participants?
- Perceived strengths and weaknesses – how popular is the model?

PROJECT PROCEDURES

This section reviews the three stages that were developed in order to realize this project. The stages of this project involved: (1) designing the methodology; (2) documenting findings for each method, based on the dimensions of analysis; and (3) synthesizing the analysis and evaluating the strengths and weaknesses, along with similarities and differences among each of the methods.

Methodology Design

Designing the methodology was the initial stage of this project. I needed to design a research methodology that would enable me to extract the scope of information I was seeking from these three creative problem solving methods and do so in a systematic, yet simple fashion. The design resulted in the creation of five dimensions of analysis (philosophical, theoretical, structural, functional and efficacy) that also needed to be supported by a number of clear and focused criteria/questions.

Documenting Findings

This stage of the process involved gathering data and objectively filling in the gaps as designed by the dimensions of analysis and their individual data-finding questions. Data was collected by flagging information in all forms of literature, by dimension of analysis, with different colored slips of paper. I also wrote in all of my books and captured each dimension's essence along side the margins of all the sources of data I reviewed. I wrote up the findings immediately following the completion of my research to each method while the data was still fresh in my head. This stage concerned itself only with reporting raw data.

Synthesis and Evaluation

The third stage of the process involved conducting a synthesis of the documented findings of each method. I first evaluated the strengths and weaknesses of each method and then provided an analysis of the similarities and differences among the methods. This process also provided final recommendations and considerations for future studies.

SOURCES OF DATA

Lateral Thinking/Edward de Bono:

I utilized eight different sources in researching Lateral Thinking and Edward de Bono. Because of the enormous amount of work de Bono has produced, it was imperative that I familiarize myself with as much of de Bono's material as possible. The first source was the book, *Lateral Thinking* (de Bono, 1970), which introduced the Lateral Thinking concept and articulates the argument between vertical (logical) and lateral (creative) thinking. The second source was *Six thinking Hats* (de Bono, 1985,

1999), which puts forth a metaphorical thinking method that helps to separate different modes of thinking in individual and group settings. Third was *I Am Right You Are Wrong* (de Bono, 1990), where de Bono puts forward a direct challenge to Western thinking and professes the use of constructive, generative thinking versus analytic, selective thinking. *Teach Your Child How to Think* (de Bono, 1992) was my fourth source. This work focuses on developing children's thinking skills through the use of Lateral Thinking techniques, Six Thinking Hats and various DATT (Direct Attention Thinking Tools) tools. Next came *Total Creativity* (Tanner, 1997), which maps the building of a more innovative organization through the use of several creative problem solving methods including many of de Bono's concepts.

The last book that I reviewed was *Serious Creativity* (de Bono, 1992). This book synthesizes de Bono's work from the last twenty-five years and brings up to date his landmark concept of Lateral Thinking. Two other on-going sources were Edward de Bono's website (<http://www.edwdebono.co.uk>) and de Bono training materials on Lateral Thinking, Six Thinking Hats, DATT and other conceptual and strategic workshops as generated by APTT (Advanced Practical Thinking Training, Inc.). A handful of articles from the *Source Book* (Parnes, 1992) and other periodicals and magazines were also reviewed during my investigation.

Synectics:

My first source of data for Synectics was *Synectics* (Gordon, 1961), which highlights some fifteen years of experimentation in training creative capacity and the psychological processes involved in creativity. This book is the first complete, published work on the history and operational mechanism of Synectics. Second was *The Practice of Creativity* (Prince, 1967), where Prince lays out Synectics as a creative problem solving method to help direct solutions to technical and theoretical problems. As with *Synectics* (Gordon, 1967), this is a seminal work. The third source was *The Operational Mechanisms of Synectics* (Gitter, Gordon & Prince, 1964), which provides a complete breakdown of the Synectics process. The next source was *The New Art of the Possible: The Basic Course in Synectics* (Gordon, 1980). This book provides instruction into the practice and application of Synectics. Two books by Tony Poze and William Gordon, *The Metaphorical Way of Learning and Knowing: Applying Synectics to Sensitivity and Learning Situations* (Gordon, Poze, 1968) and *Strange and Familiar* (Gordon, Poze, 1972), also provided much depth and insight onto the Synectics process. An on-going source of data was also provided by the Synectics, Inc. website (<http://www.synecticsworld.com>) and several articles within the *Source Book* (Parnes, 1992).

CPS – Creative Problem Solving:

Applied Imagination (Osborn, 1963, 1993) was my first source of data for its overview into the principles and procedures of Creative Problem Solving. The second source of data was *Creative Problem Solving: The Basic Course* (Isaksen & Treffinger, 1985), which provides a basic overview of CPS' systematic process. Next I reviewed *Creative Approaches to Problem Solving* (Isaksen, Dorval & Treffinger, 1994). This book builds off of the second source and describes an updated approach to CPS. I also used the information booklets published by the Creative Problem Solving Group – Buffalo (1995), along with *Creative Approaches to Problem Solving, Second Edition* (Isaksen, Dorval, & Treffinger, 2000), which contains Creative Problem Solving Group – Buffalo's latest approach to CPS. *Leading on the Creative Edge* (Firestien, 1996), *Creativity Unbound* (Vehar, Firestien & Miller, 1997), and *CPS Facilitation* (Vehar, Firestien & Miller, 1997), were also in-depth and current sources of data. Several articles from the *Source Book* (Parnes, 1992) and other periodicals were also reviewed.

SUMMARY

This section examined the methodology that was designed for this project, explained the project procedures and highlighted the sources of data from which the project findings and recommendations were drawn. Section 3 describes the results and findings of the analysis. Section 3 provides an objective and detailed view, based on the dimensions of analysis, of each method.

SECTION 3

Documenting Project findings

INTRODUCTION

Section 2 highlighted and defined the specific types of analysis that were utilized to compare the three methods and the sources of data from which the findings were drawn. Section 3 documents the raw data extracted from the investigation into each method. The information is systematically organized by each dimension of analysis beginning with philosophical and then followed by theoretical, structural, functional and ending with efficacy. I will begin with a brief introduction to the body of work of Edward de Bono and then highlight key findings from each dimension of analysis. Following the de Bono dimensions of analysis will be Synectics and then CPS.

EDWARD DE BONO

Although Lateral Thinking has typically been viewed as the overarching theme to Edward de Bono's work in the field of creativity and thinking, I felt it was necessary to provide a holistic view of de Bono's seminal methods and concepts. Because of the massive amount of work de Bono has generated, it is quite easy to lose sight of what are the true underpinnings to his work. Dr. de Bono's body of work contains much overlap from book to book and deciphering the connections and similarities and differences between his own work on thinking and creativity can be tricky. One of de Bono's latest books, *Serious Creativity* does provide an overview of his portfolio of work, yet still lacks clarity in terms of showing the reader a birds-eye-view of how all of his concepts, tools and techniques are connected to one another.

Edward de Bono tackles thinking and creativity more as a philosophy and attitude than anything else (more on this later). Dr. de Bono's philosophical approach to creativity is supported by numerous tools and techniques. Some of these tools may act as actual methods/processes yet function primarily as tools or techniques that contain sub-tools and sub-techniques. Much of de Bono's work seems to be fractionalized and does not demonstrate enough differentiation across his numerous concepts, tools and techniques and contains overlapping themes. My objective was to move beyond the appearances and illusions and understand the matrix behind it all. In other words, "what is or what are the things that propel de Bonian thought and practices."

What follows is a brief explanation of de Bono's work in general and how it is all connected. Although I provide greater detail and bring clarity to how all of de Bono's work is interrelated in the theoretical, structural and functional dimensions of analysis, it

is imperative to understand how Lateral Thinking is connected to Parallel Thinking (Six Thinking Hats) and many of the other thinking concepts and techniques de Bono has brought to the field of creativity.

It became apparent during my investigation of the literature and after interviews with professionals in the field that there is much debate as to whether or not de Bono's thinking practices may be referred to as an actual framework and structured thinking process or simply as a philosophical approach to thinking (attitude of the mind) supported by numerous tools and techniques.

Let's begin with the end. Edward de Bono's entire body of work is supported by three pillars – Lateral Thinking, Parallel Thinking and DATT (Direct Attention Thinking Tools). Dr. de Bono is also known for his CoRT Thinking Lessons, of which take into account Lateral Thinking, Six Hats and DATT techniques and tools. It is safe to say that CoRT, in and of itself, does not necessarily offer anything new or different, except in educational settings, than what will be discussed in the following three pillars. Following are brief overviews to each of these pillars.

Lateral Thinking:

Lateral Thinking, unlike CPS, Synectics and many other structured creative problem solving methods, is a philosophical approach to generating ideas and solving problems through a willingness to look at things in a different way. Lateral Thinking is not a creative problem solving method with explicit steps. It is a behavioral approach (mindset) concerned with changing concepts, patterns and perceptions. The philosophical approach of Lateral Thinking is supported with unconventional thinking techniques used to attack problems, generate new ideas, challenge existing patterns, build on concepts, and seek alternative solutions. The reason why these are referred to as techniques is because they set out to have you perform and accomplish a task in a certain behavioral method or manner. For example, all of the Lateral Thinking techniques have been designed to make an individual look at something from a different perspective

To summarize, Lateral Thinking is an attitude of the mind to generating new ideas and solving intractable problems, supported by unconventional thinking techniques. Lateral Thinking looks for individuals to adopt a more generative versus selective mindset to solving problems and creating new ideas. It is a sense of “hey, I now choose to look at things differently and understand that our conventional ‘constructive’ thinking practices are not enough for me to solve problems and generate novel ideas. I will now use these unconventional techniques to help me change my perception about my current situation and enter a realm of generative thinking”.

Parallel Thinking:

The essence of Parallel Thinking is that individuals of a group look (think) in the same direction at all points in time. Although the direction may be changed at any time, individuals will, together, continue to look and think in the same direction. Parallel Thinking allows the brain to maximize its sensitivity in different directions at different times. Edward de Bono uses the analogy of a golf club in that it is not possible to design a golf club that is the best for driving and at the same time the best for putting. The tool that allows Parallel Thinking to occur is Six Thinking Hats.

Six Thinking Hats was designed to metaphorically have people 'wear' different colored hats, representing different modes of thought during a meeting or problem-solving session. Each hat represents a direction and ensures that the experience, intelligence and knowledge of each group member is fully used as the entire group works and thinks in the same direction. Six Thinking Hats is actually both a method/process and tool at the same time and provides the user flexibility in the arrangement of the hats depending on the task at hand. Six Hats is a non-linear process and tool that allows an individual to accomplish different tasks from idea generation and meeting facilitations to acting as a control mechanism to organize a person's thoughts and enhancing communication and team productivity. These hats will be covered in more detail later.

DATT (Direct Attention Thinking Tools):

DATT are designed to improve individual thinking through a framework for defining a situation that will improve a person's ability to consider all consequences before taking action. These tools allow an individual to weigh risks, reach solutions quicker, avoid mistakes, strengthen decision-making abilities, look beyond current boundaries, remove obstacles and assess all angles of any situation. DATT are simply a set of ten strategies to help sharpen individual perception and focus a person's thinking in order to improve situation-defining skills.

These three pillars will be looked at in closer detail in the following dimensions of analysis. Next are the findings relative to Edward de Bono's philosophical approach to the field of creativity and Lateral Thinking.

PHILOSOPHICAL DIMENSION OF ANALYSIS

In order to set the tone and allow you to follow along with the data in an organized fashion, I will restate my definition of each dimension of analysis before the presentation of the findings.

Definition: “Logical analysis of the assumptions, beliefs and values underlying the conduct, thought, knowledge and nature of a phenomenon.”

Lateral Thinking, Parallel Thinking (Six Hats), and DAT (Direct Attention Thinking Tools) originated from Edward de Bono, a Rhodes scholar at Oxford University. Dr. de Bono has also held appointments at the universities of Oxford, Cambridge, London and Harvard. Edward de Bono’s background is in both psychology and medicine. Dissatisfied with the historical and current thinking practices of our western educational system, de Bono called for a new process of thinking in order to move us from a critical or ‘constructive’ thinking society to a creative and ‘generative’ thinking society. In order to completely understand why de Bono brought about his philosophical approach to thinking and creativity, we must first understand what triggered his dissatisfaction with traditional thinking.

Edward de Bono believes that there are three basic aspect of thinking: “what is”; “what may be”; and “what can be”. He feels that as a society we have been obsessed with “what is”. Dr. de Bono says that we underestimate the valuable contribution that “what may be” has made to progress and that we do very little about placing emphasis on “what can be”, even though our future depends on it.

Edward de Bono blames, in part, this existing mindset on what he refers to as the ‘Gang of Three’: Socrates, Plato and Aristotle. Edward de Bono blames Socrates for his concern with proving things wrong and his dangerous belief that if you removed all that was wrong, you would be left with what was right. He blames Plato, the arrogant and fascist Athenian, for his notion of “truth”, which became the weapon of perpetual conflict between those who possessed rival truths. And finally, de Bono blames Aristotle, who believed that men had more teeth than women based on the fact that a stallion had more teeth than a mare. Because of this belief, Aristotle “knew” that the male of the species has more teeth than the female. Aristotle formulated his categories from the past and then argued whether something did or did not fit into a particular category. The Gang of Three came to dominate our thinking and proclaimed that “knowledge is all” and that something has to be proved “bad” before it is changed, which de Bono feels has had a disastrous effect on education and society.

Dr. de Bono contends that because of this “knowledge is all” concept, society has deemed that once you have knowledge (intelligence), things like design and action are minor intellectual operations. This, de Bono says, has taught us to look harder and harder

in the same direction because that is where our expertise and intellectual investment has been and we completely ignore the ‘unknown’ and tend not to look in different directions for progress. He feels that we rely too heavily on information and points the finger at our educational system for engraining this into this mindset. Since a very young age, we have been taught to learn information in hopes of acquiring intelligence. It is clear to de Bono that if we had perfect information in a particular situation then thinking would not be necessary. Since the chances of getting perfect information are quite low, de Bono argues that the need for thinking becomes greater and greater because we have to make sense of the information. This is where thinking and creativity is necessary. De Bono strongly fights the intelligence versus creativity debate claiming that many intelligent individuals are actually poor thinkers.

Unfortunately many people with a high intelligence actually turn out to be poor thinkers. They get caught in the ‘intelligence trap’ and take up a view on a subject and then defend that point of view very ably. The better someone is able to defend a view the less inclined is that person to actually to explore the subject. (de Bono, 1990, p. 150)

Dr. de Bono offers us the analogy of a car and driver to explain the relationship between intelligence and creative thinking. He believes that the power of a car is the potential of the car just as intelligence is the potential of the mind. The skill of the car driver determines how the power of the car is used. In other words, the most humble of minds may outperform the most powerful minds. These are the main reasons that prompted Edward de Bono to shift our thinking from ‘reactive’ to ‘proactive’ and ‘constructive’ to ‘generative’.

How he brought about his philosophical approach to creativity and thinking is through his work with self-organizing systems. His philosophical approach to the field of creativity originated from his interests in understanding biological ‘self-organizing’ information systems. Edward de Bono is only one of a select few who take this mathematical, self-organizing systems approach to the field of creativity and thinking. Dr. de Bono has preferred to look at the behavior of self-organizing information systems, which are also known as patterning systems. Self-organizing systems allow incoming information to organize itself into routine patterns. Edward de Bono explains,

If the brain were not a pattern making system we would not be able to read, write or talk. Every activity, like getting dressed in the morning, would be a major time-consuming task. Sport would be impossible – for example, a golfer would have to consciously direct every part of his swing. Consider the millions of people who drive along the roads everyday using patterns of perception and reaction and only occasionally having to work things out. There are routine patterns of action, like driving or playing golf. These are routine patterns of perception, which is why we can recognize knives, forks and people. There are routine patterns of meaning, which is why we can listen and read and communicate. (de Bono, 1990, p. 82)

Dr. de Bono believes we should be grateful for these routine patterns. However, in order to bring about creativity and alter our perception we must get across to available side patterns. Edward de Bono claims that the brain is not designed to be creative because of the deep patterns that are formed in our minds by incoming information. He points out that creative thinking is not a natural process because the natural process of the brain is to form patterns and to use them and not to seek to cut across patterns. An example of a self-organizing system is that of rainfall and its impact on the landscape. Rain that falls onto a landscape will eventually form streams, rivers and valleys. As rain falls and these streams, rivers and valleys are formed, future rainfall is channeled along these impressions in the landscape. Soon, channels are formed and affect the way future rain is collected and organized. This is how de Bono sees the interaction between the mind and incoming information and believes the mind handles information in a predictable and characteristic fashion. For this reason, de Bono set out to create new thinking processes such as Lateral Thinking.

Dr. de Bono promotes that these new thinking processes will allow us to divert from these patterns into side patterns that enable us to bring about creativity and the generation of new ideas. He professes that simply understanding the logic of creativity does not in itself make you more creative and that deliberate thinking processes must be learned in a disciplined manner. For de Bono, creativity is an attitude of the mind and urges us to think more and states that “if you never change your mind...why have one?” Next will be the theoretical foundation to Lateral Thinking.

THEORETICAL DIMENSION OF ANALYSIS

Definition: “General principle or set of principles formulated to explain the operation of the phenomenon. Plan as to how the phenomenon works.”

Lateral Thinking:

The term Lateral Thinking was invented by Edward de Bono in 1967 and is defined by the *Oxford English Dictionary* as “a way of thinking which seeks the solution to intractable problems through unorthodox methods, or elements which would normally be ignored by logical thinking”. Lateral Thinking is concerned with the ability to change ideas and perceptions widely. This means that trying harder in the same direction may not be as useful as changing direction. With this thought in mind, many are familiar with the informal definition of Lateral Thinking as, “*you cannot dig a hole in a different place by digging the same hole deeper*”. This means that trying harder to realize a solution in the same direction may not be as useful as changing directions.

In terms of differentiation, Lateral Thinking is quite distinct from vertical thinking or logical thinking. Where logical thinking is concerned with “truth” and “what is”, Lateral Thinking is concerned with “possibilities” and “what might be.” Moreover, in logical thinking an individual moves forward by taking sequential steps, each of which must be justified. In comparison, Lateral Thinking strives to establish new directions and perceptions. Simply, logical thinking is selective and Lateral Thinking is generative.

Lateral Thinking is concerned with changing concepts, patterns and perceptions and is based on the behavior of self-organizing systems. By pattern, de Bono means the arrangement of information on the memory surface that is the mind. Lateral thinking sets out to restructure and break-down existing patterns by putting things together in a different way and liberating information. In fact, Lateral Thinking is no more than a special type of information handling. The problem with patterns, de Bono (1992) explains, “we do not see the world as it is but as we perceive it. The patterns of perception have been built up a particular time sequence of experience. We perceive the world in terms of the established patterns that are triggered by what is now in front of us” (p. 58). This means that the brain can only see what it is prepared to see, so when we analyze data we can only pick out the idea that we already have. We see things in terms of our perception – perception that has been deeply in-grooved by past experiences. For these reasons, Lateral Thinking was designed to help individuals switch patterns of thought and perception, and in essence, trick and provoke the mind into pursuing a new direction. Specifically, Lateral Thinking is used to generate new ideas, problem solve, process perceptual choice, reassess situations and to help prevent sharp divisions and polarizations. What allows Lateral Thinking to do so is as follows.

The main principles for carrying out Lateral Thinking are ‘provocation’ and ‘movement’. Provocation allows our mind to get out of the established track and with movement we move forward from the new track. Once this is accomplished, if the new idea is considered valuable, we see the value in hindsight and forget about how we got there. The following figures illustrate the action of provocation (figure 3.1) to switch us from the main track. Figure 3.2 shows the forward movement on the new track and figure 3.3 shows how provocation and movement take us to a side-track and then back to where we began without ever moving forward on the normal track.

Figure 3.1
Adapted from de Bono, 1982

Figure 3.2
Adapted from de Bono, 1982

Figure 3.3
Adapted from de Bono, 1982

Edward de Bono coined the word ‘po’ to signal a provocation. Po is derived from the words *hypothesis*, *suppose*, *possible* and *poetry*. These words allow us to use a statement (po) to go forward in new directions, such as “po (suppose) cars had square wheels”. When the mind is provoked it is then possible to rearrange information to create new patterns and to restructure old ones. Provocation provides the opportunity to move laterally and generate connections that have nothing to do with experience. Provocation

carries out experiments in the mind and works much like humor. Humor occurs when we are moved along a main track and then deposited at the end of a side-track through the use of the punch-line (figure 3.4). In other words, we are led down a track of thought and then we are jolted into a different plane when the punch-line is delivered. The joke suddenly is not what we expected yet the end result is enjoyable and logical in hindsight.

Figure 3.4
Adapted from de Bono, 1982

As with provocation, movement is not a normal part of our thinking behavior. Movement is an active mental process and is different than judgment, where we compare an idea to our existing patterns and experiences and move to reject or criticize the idea if there is a mismatch. Furthermore, judgment seeks to keep us on the same track without deviation. With Movement, an idea is moved forward by thinking “where will this lead us to?”, whereas judgment is concerned with “will it or will it not work?” or “is it or is it not?” Movement is not just an absence of judgment. Rather, it is concerned with where we can “move” to from the idea without any judgment whatsoever. Dr. de Bono professes, that movement is quite different from the act of deferring of judgment found in many other creative thinking practices. Dr. de Bono feels that just telling people to defer judgment does not tell them what to do. Instead of deferring or delaying judgment, movement seeks to:

- extract possible principles, concepts or features from an idea, regardless of its value at the time.
- experiment with different approaches to an idea to seek out multiple possibilities.
- visualize with an idea from ‘moment-to-moment’ to see what may happen.
- uncover positive aspects of an idea.
- identify under what circumstances an idea may be of value.

To summarize, in movement, we come to an idea and we are totally uninterested in whether the idea is right or wrong or whether it has little value or potential at the time. It means moving from a weak idea to a stronger one. With movement, no ideas are discarded and one works diligently to create new possibilities from what exists.

It is important to note that although provocation and movement are the propelling principles behind Lateral Thinking, they are also referred to as specific techniques within the Lateral Thinking portfolio. Provocation and movement, along with the other Lateral Thinking Techniques will be looked at in greater detail in the structural and functional dimensions of analysis.

Parallel Thinking:

The principle that drives Parallel Thinking and Six Thinking Hats is organization of thought. Parallel Thinking promotes the idea that we must organize our thinking and try not to engage on too many trains of thought all at the same time. Parallel Thinking ensures we do only one sort of thinking at a time and the six different colored hats of Six Thinking Hats allows us to ‘wear’ one hat at a time, each representing different modes of thought:

White Hat	- Gathers needed and known information
Red Hat	- Expression of feelings, emotions, hunches and intuitive thoughts
Yellow Hat	- Expresses values, feasibility and the benefits to the situation/idea at hand
Green Hat	- Generates alternatives and explores creative ideas
Black Hat	- Focuses on the cautions and difficulties that may arise with an idea
Blue Hat	- Manages the framework of the thinking process

DATT (Direct Attention Thinking Tools):

What propels DATT are the strategic thinking frameworks behind each tool. These frameworks allow you to sharpen your perception and focus your thinking in a comprehensive and organized manner. DATT seeks to strengthen situation defining. DATT is not a process unto itself and is merely a set of strategic tools. The basic principle common to all of these strategic thinking tools is to enhance and broaden your viewpoint and perception by considering all consequences before taking action.

Following will be findings from the structural dimension of analysis.

STRUCTURAL DIMENSION OF ANALYSIS

Definition: “Arrangement or interrelation of all the parts of the whole. Manner of organization or construction of the whole.”

Before proceeding into the structural analysis of Lateral Thinking and then into Parallel Thinking and DATT, I felt it is was important for you to get a quick bird’s-eye-view of Edward de Bono’s portfolio. Viewing de Bono’s key pillars and supporting tools and techniques will help to clarify what goes where and how. Following this table will be the structural breakdown of Lateral Thinking.

Edward de Bono Portfolio

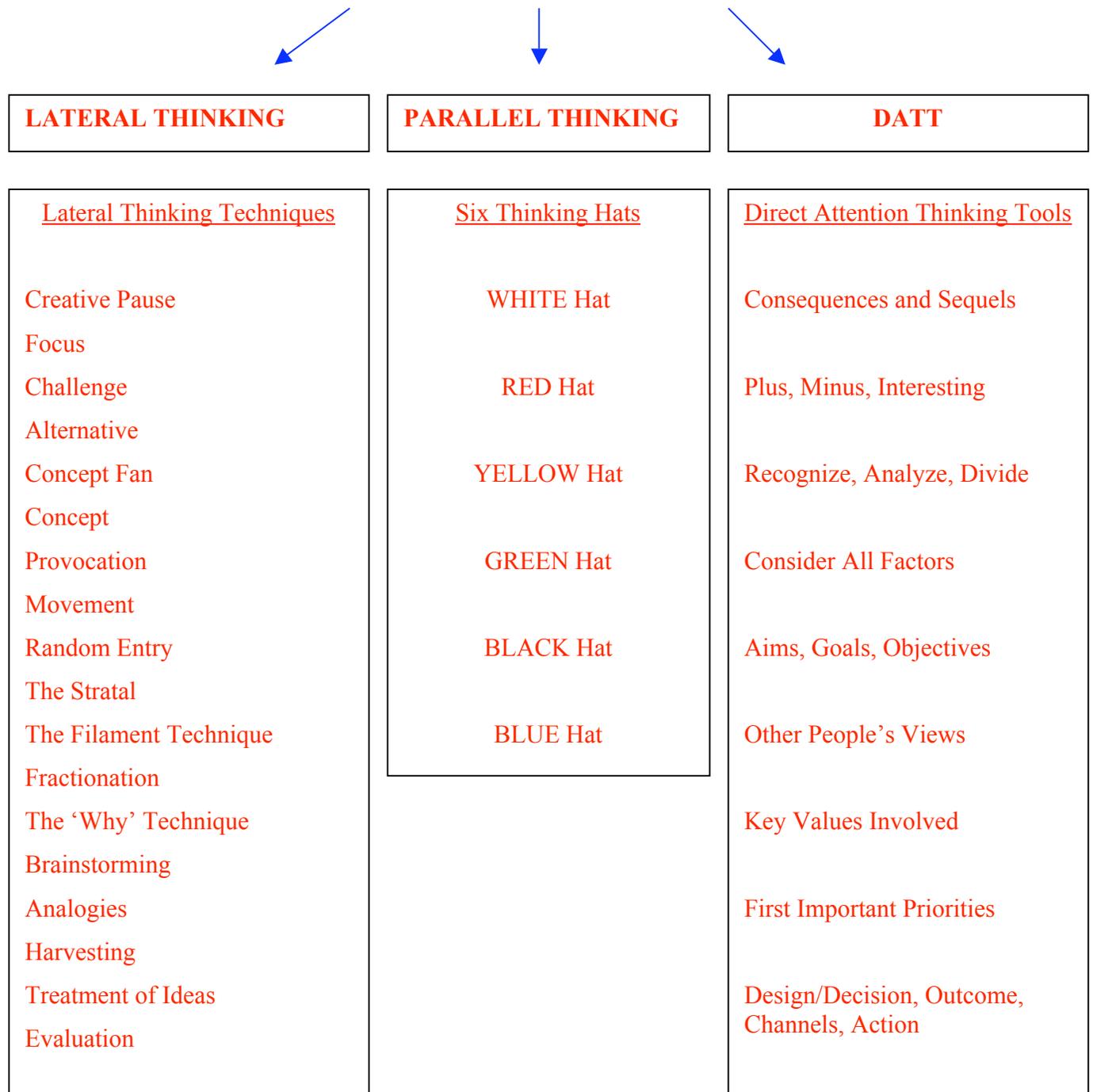


Figure 3.5

Lateral Thinking:

As mentioned earlier, Lateral Thinking is not a creative problem solving method with explicit steps yet is a behavioral (mindset) approach concerned with changing concepts, patterns and perceptions. This Lateral Thinking philosophy is supported by unconventional techniques used to carry out the goal of moving “side-ways” or laterally to resolve problems, generate new ideas, challenge existing patterns, build on concepts and seek alternative solutions.

Parts

The parts to Lateral Thinking are simple. The Lateral Thinking philosophy persuades individuals to approach problem-solving and idea generation through the use of unconventional thinking techniques.

Lateral Thinking Philosophy

Lateral Thinking philosophy states that the brain is not designed to be creative because its natural process is to form patterns and to use them accordingly. Without these patterns, life would be impossible because the simplest of tasks would be incredibly time-consuming. Furthermore, it is because of these patterns that we do not see the world as it is but as we perceive it. Experience and knowledge allows us to form deeply entrenched patterns that provide us with perception. The result of creativity and insight is when we consciously and deliberately cut across patterns in hopes of attaining a different perspective from our current reality. Edward de Bono provides the user with thinking techniques that allow us to “cut across patterns” and alter our perception.

There has been much criticism aimed at de Bono for the fact that he only has a portfolio of tools and techniques and that his work has never been structurally organized in a way that individuals can easily and systematically follow along from principles to components, components to stages, and properly use phases and tools within corresponding stages.

In order to understand what makes the Lateral Thinking philosophical approach operational, below you will find brief descriptions to each Lateral Thinking technique.

Lateral Thinking Techniques

Creative Pause

Creative Pause is an interruption in the smooth flow of any routine in order to once again pay deliberate attention. This pause is not in reaction to anything and you simply pause in your thinking solely because you want to and not because of legitimate reasons. Creative Pause works off of the notion that creativity is one of the occasions where thinking slowly is an advantage and an investment. Halting the smooth flow of thought for twenty to thirty seconds may spark alternatives and give attention to something that may be useful later.

Focus

Focus contends that powerful results can be obtained by focusing on matters that everyone else has ignored. One does not generate ideas with focus, yet should be willing to note a point as a potential focus for creative effort. Once a focus has been defined, it can then be treated as a real problem. Focus helps pick out and define a creative focus as a 'general-area-type' focus, which is a broad focus, or a 'purpose-type' focus, which looks at narrowing the focus. This technique encourages looking at multiple focuses and alternative definitions to those focuses.

Challenge

Challenge, one of the most fundamental techniques, persuades individuals to refuse to accept things as they are or that the current way is necessarily the best way. Challenge is not criticism, rather looks to challenge 'uniqueness'. Challenge sets out to seek alternative ways of doing something by blocking the current path, escaping the current path or completely dropping and moving away from the current path altogether. This technique also challenges 'continuity' where something is done in a certain way because it was done that way in the past.

Alternatives

This technique involves the willingness to seek out alternatives even though the next step seems to be logical and available. Alternatives pushes an individual to stop to look for alternatives regardless of what may already be present. This technique also shows how to extract the concept behind a group of alternatives and then use it to generate more alternatives.

Concept Fan

Concept Fan is a method for finding different ways of doing things by understanding concepts. This technique allows you to analyze a situation and work backwards from the objective to the broad concepts or "directions" that we would have to take to get there. From directions we continue to work backwards to concepts and then to the original idea. This technique allows you to uncover and understand the many layers that go into a final solution or idea and analyze them one at a time if need be – objective/purpose _ broad concepts _ directions _ concepts _ ideas. This technique helps individuals become conscious of different levels of abstraction, from the broadest conceptual levels down to specific ideas.

Concept

Concept teaches how to work at the conceptual level in order to breed further ideas. This technique contends that it is important to "pull back" from any idea to discover the concept behind the idea. Once the concept is extracted, work can be done to strengthen the concept, change the concept, or find better ideas with which to put the concept into action.

Provocation

Provocation provokes us to look at things not as they are but as what they might be. Provocation contends that we must change our perception in order to change directions and seek alternative solutions and questions "what if", "suppose" "what would happen...?", etc. There are several sources of provocation that allow this technique to operate. There are escape provocations, which allow the individual the opportunity to simply do without the point or idea in question. There are also four stepping-stone provocations known as reversal, exaggeration, distortion, and wishful thinking.

Figure 3.6

Lateral Thinking Techniques (Cont.)

Movement

Movement allows us to ‘move’ an idea forward regardless of whether or not it may seem to be of value or have potential. Movement is not concerned with judging rather it seeks to extract possible principles, concepts or features from an idea and experiments with different approaches to an idea to seek out multiple possibilities. Movement encourages visualizing with an idea from ‘moment-to-moment’ to see what may happen. Movement also uncovers positive aspects of an idea and identifies under what circumstances an idea may be of value.

Random Entry, The Stratal & The Filament Technique

These three techniques all work off of the same principle. Random Entry is used to generate new ideas using unrelated words, objects or pictures. The operative word is ‘random’ meaning the input of information or materials, utilized to stimulate thought, is random and not chosen. The Stratal is similar to Random Entry but less provocative. A stratal is a number of unconnected statements (usually about five) put together solely to sensitize the mind so that new ideas come forward. These statements are unconnected into each other yet are connected to the situation at hand. Ideas are spawned from combining these disconnected thoughts. The Filament Technique explicitly or unconsciously picks out items in each stratal to form new idea. For example the word dog from one stratal is picked while the word science is chosen from the second stratal. The objective of Filament is to combine totally unrelated words from each of the stratals. Many creative thinking practices refer to the above techniques as forced connections.

Fractionation

Fractionation seeks to provide a complete or true breakdown of a situation into component parts and then reassemble them. For instance, “unloading ships in harbor” may be broken into four separate components parts 1) unloading; 2) ships; 3) in; and 4) harbor. These component parts are then used to reassemble and restructure the situation.

The ‘Why’ Technique

Also known as the Ladder of Abstraction in CPS, the ‘Why’ Technique challenges assumptions and its purpose is to elicit information at both broad and narrow levels of focus. This technique functions through continuous questioning of ‘why?’ until enough information has been elicited.

Brainstorming and Analogies

De Bono also suggests group brainstorming for idea generation and the use of analogies for pattern reconstruction and problem definition.

Harvesting & Treatment of Ideas

Harvesting captures your creative output by helping to organize ideas and concepts into certain categories through the use of a checklist. This checklist contains categories for specific ideas, “for-instance” ideas, seedling ideas, direct concepts, “pull-back” concepts, directions, needs, new focuses, changes, and flavor. The harvesting procedure is not just a hindsight recording but should be a consciously monitored activity throughout any session.

Treatment of Ideas shows how to develop ideas and shape them to fit an organization or situation.

Evaluation

De Bono suggests we use end categories during the evaluation process in order to organize all alternatives. Categories may include, usable idea, good idea but not for us, good idea but not now (back burner), needs more work, powerful but not usable, interesting but not usable, weak value, and unworkable. Major consideration that might be used to evaluate an idea might be benefits, feasibility, resources, and fit. Final evaluation tools include points systems, direct comparison, hindsight logic, emotions and circumstance to help smoothen and manage the decision making process.

Figure 3.7

Parallel Thinking:

As highlighted earlier, Parallel Thinking was designed to organize individual and group modes of thought. Six Thinking Hats is the tool that enables us to think along parallel lines. Although Six Hats is typically referred to as a tool, if used correctly, it also acts as a structured thinking method and/or process. The structural breakdown of Parallel Thinking, represented by Six Thinking Hats, is as follows:

Parts

Since Six Hats is not necessarily a creative problem solving method and has been designed more as a tool, it really only has one part that is broken down into six hats 'stages' that represent different modes of thought. It is important to note that not all the six hats have to be used in any given scenario. At times, you may just need emotional thinking (Red Hat) and creative thinking (Green Hat) and at other times you may choose to incorporate all six hats for a more thorough facilitation process.

Stages, Phases, Tools

Each hat represents one thinking stage. These stages ('hats') do not follow any particular order nor do they all have to be used during one meeting or problem solving session. The order of the hats may be arranged differently for every session, depending on the situation at hand. In terms of phases, both divergent and convergent thinking are present throughout the six hats. The white, green, and red hats skew more divergently, while the black hat deals specifically with convergent thinking and the yellow hat equally shares both divergent and convergent thinking. Since the blue hat is in essence the process control, it must balance both divergent and convergent thinking. Depending on each individual session, one may oscillate between divergent and convergent thinking under any of the hats. In order to understand how these hats work individually as tools and then all together as a process, I have provided the following analysis.

Six Thinking Hats

BLUE Hat

The Blue hat is used both at the beginning and end of each session for process control. The Blue hat represents the thinking that is needed to explore a certain subject. In essence, the individual who wears the Blue hat (there is just one person responsible for wearing the Blue hat) is the session facilitator and planner. The Blue hat manages the flow of thought and guides the process along. The person responsible for the Blue hat (facilitator) organizes the use of the other hats. It is this person's responsibility for making sure that the group continues to think along parallel modes of thought at all times. This person is looking at the thinking that is taking place and choreographs the entire session, ensuring that the members of the group are working together in the same direction.

WHITE Hat

This hat is usually used at the beginning of a session as a background for the thinking that is going to take place. The White hat seeks out information that is missing and known. It deals with neutral fact and data finding. These facts and figures are reported objectively without interpretation. The white hat helps to lay the foundation for the session by extracting all pertinent information.

RED Hat

The Red hat allows individuals the opportunity to express emotions, feelings and intuition without any need to justify them. The Red hat should always be done on an individual basis and no-one person should be allowed to 'pass'. This is based on the notion that all decisions must be emotional in the end. Our choice of direction and the decisions we make are always based on emotions and values. This is a key hat within the entire process and enables us to surface emotions such as fear, anger, hatred, suspicion, jealousy, love, etc.

BLACK Hat

The Black hat is the most commonly used of all the hats. It is known as the "devil's advocate" hat. This hat represents caution and critical thinking and is useful for questioning the strength of evidence. The Black hat signifies a convergent phase and seeks to keep the thinking logical and constructive, in hopes of identifying errors or weaknesses in an idea or solution. These reasons 'weaknesses' must stand on their own and must make sense without persuasion...they must make sense in 'cold print'.

YELLOW Hat

A thinker under this hat deliberately searches out whatever benefit there may be in a suggestion. This hat forces people to spend time seeking out value in ideas. Yellow hat thinking should be logically based and there should be some reason for the value put forward. This is a judgment hat and not based on fantasy. The Yellow hat is similar to the solution strengthening stage in many creative problem solving methods.

GREEN Hat

The Green hat is the creative hat. It is under this hat that we generate ideas and lay out options and alternatives. Here we seek to modify and strengthen suggested ideas. The Green hat is used to overcome obstacles and cautions uncovered with the Black hat. This is a deliberate and focused idea generation stage, along with a solution strengthening stage. Many Lateral Thinking techniques and DATT may be utilized under this hat in order to seek alternative solutions.

Figure 3.8

DATT (Direct Attention Thinking Techniques):

DATT are ten strategies to help sharpen individual perception and focus a person's thinking in order to improve situation-defining skills. Since these tools are all designed to provide the same function (improve a person's ability to consider all consequences before taking action) and stand alone with no problem solving process involved, there will be no analysis as to the parts, stages and phases of DATT. Below I have highlighted the purpose of each tool.

Figure 3.9

DATT – Direct Attention Thinking Tools

Consequences and Sequels

This tool is designed to have you look ahead to see the consequences of an action, plan, initiative or decision through questioning exercises. C&S, is not only an exploration into the future, asking “will it work out?”, but also an evaluation tool that helps to probe “what are the benefits, problems and costs associated with this suggestion?”. C&S concentrates on looking at immediate, short-term, medium-term and long-term consequences of any given situation.

Plus, Minus, Interesting

PMI forces a thinker to explore all sides of a matter before a decision or commitment is made. Similar to other evaluation tools like PPCo (Pluses, Potential, Concerns, Overcome concerns), PMI is a scanning tool. We look first at all pluses, then minuses and then interesting points, in order to bring clarity to the situation in question.

Recognize, Analyze, Divide

RAD allows the thinker to break anything large into smaller, more manageable parts. RAD helps individuals to first recognize the totality of the situation, analyze all of its components and then divide them up into manageable parts. These manageable parts are then tackled, one at a time.

Consider all Factors

This tool is designed to increase the breadth of perception. CAF explores all factors related to an action, decision, plan or conclusion.

Aims, Goals, Objectives

AGO deliberately uncovers the intentions behind actions and zeros in on what is the objective of our thinking in a given situation. AGO is related to the thinking habit of wanting to know the focus and purpose of thinking at every moment. AGO works off of the notion “if we know where we want to go, we are more likely to get there”.

Alternatives, Possibilities, Choices

Instead of moving forward, with APC we look at ‘parallel’ possibilities. APC deliberately tries to find other alternatives such as perception, action, solutions, approaches, explanations and design alternatives.

Other People's Views

OPV asks two questions: 1) who is affected by this thinking (action)?; and 2) what are the views (thinking) of those affected? OPV helps put us into other's shoes and uncover their values and perspective.

Key Values Involved

This tool ensures that our thinking serves our values. KVI reminds us to check and understand our core values so that we do not waste time thinking in directions that are not in alignment with our own and other's values.

First Important Priorities

FIP is concerned with priorities and trying to see what really matters – not everything is equally important. FIP ranks objectives or suggestions by prioritizing them. These priorities are guidelines that help us rank most important ideas, factors, objectives consequences, etc. Once we have a clear view of the priorities we can choose between the various alternatives.

Design/Decision, Outcome, Channels, Action

This tool deals with action planning. It directs attention to the outcome of the thinking and focuses on taking action and ensures that objectives are realized.

FUNCTIONAL DIMENSION OF ANALYSIS

Definition: *“Natural or required activity that is expected. How the method intends to perform and be useful.”*

Lateral Thinking:

In order for the Lateral Thinking to function properly, several things need to happen; 1) subscribe to the mindset that unconventional thinking techniques enable us to cut across patterns in the mind in search of establishing new concepts, patterns and perceptions; 2) understand that only deliberate and constant use of these tools will allow us to think differently; and 3) adopt an attitude of the mind that says *“provoking thought and continuously moving forward are the underpinnings to help me change perceptions and directions in any situation.”*

Lateral Thinking techniques may be used both on an individual and group level and provide the thinker with exercises that help her/him to realize his/her end goal. These techniques are easy to learn and understand because they are more of a behavioral manner or method of solving problems and generating ideas. Lateral Thinking techniques are not complex thinking techniques reserved only for experts of creativity and thinking. What seems to be confusing is the amount of work under the de Bono umbrella and how it all links together in terms of providing one, holistic creative problem solving method. Experimenting with all of these techniques will serve the thinker well as they familiarize themselves with the strengths and weaknesses of each technique. Lateral Thinking is universal and applicable across multiple contexts and has been, as all of de Bono’s work, translated into over 30 different languages.

Parallel Thinking (Six Thinking Hats):

In order for Six Thinking Hats to perform, all members of a group must be working in the same direction and be willing to simultaneously think in the same mode as one another throughout the session. Like Lateral Thinking, Six Hats may be used on both an individual and group level. In group settings, it is critical to have a strong facilitator (Blue Hat operator) that manages the thinking process at all times, sets the objectives up front and closes down the session with actionable next steps. Six Hats will extract information in such a way that will provide the group with a map of their thinking. For this reason, it is important to adhere to only one hat at a time and exhaust all possible thinking before switching hats.

As a tool, Six Hats is easy to understand and utilize. The color-coded metaphor of ‘wearing’ hats is universal and simple in application. In terms of utilizing Six Hats as a full process and in more complex situations, it is important to become familiar with the strengths and weaknesses of each hat and experiment with the sequencing of the hats in

different situations. For example, intervening in a situation that has been plagued by heated debate and hatred, it would make more sense to begin with the Red hat in order to surface all emotions and feelings so that the rest of the process will not be influenced by Red hat thinking. Whether utilized as a tool or process, Six Thinking Hat functions without many complications and is universal in its application across multiple contexts. Formal training would be beneficial in terms of utilizing Six Hats to manage group thinking, dynamics and more complex situations.

DATT (Direct Attention Thinking Tools):

Similar to the Lateral Thinking techniques, DATT functions when individuals believe that perception and situation-defining skills can be strengthened through the deliberate use of unconventional tools. DATT are easy to understand and utilize and require no formal training to operate. They are universal in application across multiple contexts.

SYNECTICS

PHILOSOPHICAL DIMENSION OF ANALYSIS

Definition: “Logical analysis of the assumptions, beliefs and values underlying the conduct, thought, knowledge and nature of a phenomenon.”

The creative problem solving method known as Synectics, comes from the Greek words syn, meaning to “bring together” and ectikos, meaning “diversity”. The word Synectics was coined in 1956 by William J. Gordon, while Synectics, the creative problem solving method was co-founded by William J. Gordon and George M. Prince. As with many creativity and thinking practitioners and researchers, Gordon and Prince believed that our educational system places too heavy of an emphasis on discrimination (the ability to differentiate one thing from another), which ultimately teaches us to avoid errors. This in turn develops our ability to pinpoint flaws in ideas rather than adopt an idea for fear that we will be punished for being wrong. Dissatisfied with the educational system, Gordon and Prince moved to change current teaching and learning beliefs by demonstrating the power and value behind non-traditional creative thinking practices versus traditional, analytic thinking processes. Prince explained:

One’s conscious mind contains all that one knows which is readily available. This information is well organized and interconnected on a logical basis. The conscious mind is a square shooter, characterized by its desire to organize, to make rules of thumb and live by them. These characteristics of the conscious mind are invaluable for learning, putting things in order, and testing hypothesis in a logical way. On the other hand, one can see that the conscious mind tends to be inhibited by the very qualities that make it useful. It lives by rules and by logic; it resists “irresponsible” speculation. People who rely heavily on their analytic ability find it very difficult to entertain ideas that are foreign to the “rules” they have learned. (Parnes, 1992, p. 168)

Prince and Gordon believed that nearly all individuals begin life as highly creative beings. At about the age of eight or nine, research suggests that we begin to seriously undermine our creative potential because of bad and destructive thinking and behavioral habits. Prince and Gordon attributed this again to our educational system. As adults, we possess both constructive and destructive behaviors, of which our destructive behavior comes into play more naturally as we begin to problem solve. This, Gordon and Prince claimed, seriously inhibits creative accomplishment and if we wish to fully tap our creative capabilities we must take deliberate steps to change our behavior and learn to adopt and become curious about the new and strange. For these reasons, Synectics was developed in hopes of encouraging ‘constructive’ behaviors and controlling our destructive behaviors.

Gordon and Prince worked closely together from 1958 to 1966 during which time they refined Synectics as a creative problem solving method. William Gordon began his initial investigation into creative thinking at Harvard University in 1944. This research set out to increase the probability of success in situations that demand creative thinking. Specifically, the focus of this research was to observe the interaction between psychological mechanisms ‘conscious and subconscious mental activity’ during the process of a creative act. What motivated Gordon to pursue this initial research was his belief, which came as a result of observation, that like-comparisons and connection-making play a crucial role in the creative process.

Once I discovered how to develop new connections on purpose and how to use them, it became possible to apply this insight to a broad range of problems and to train people how to take the simple steps needed for producing new connections. (Gordon, 1971, p. 47)

In 1951, George Prince was convinced, based on his familiarity of Jung and Freudian principles of psychoanalysis, that imagination and the generation of ideas could be stimulated by the proper use of repressed thoughts. An advertising executive, Prince began to experiment with creative people and psychologists in hopes of understanding how new ideas could be generated on every day problems. George Prince was motivated to make thinking operations visible so that any operations that tended to be repressed could be stimulated, making an individual a more effective problem solver and learner.

George Prince met William Gordon in 1958, while Gordon was a part of the Invention Design Group of Arthur D. Little, an industrial research company. Prince and Gordon then began working together, as a part of Arthur D. Little, to develop new products, processes, and procedures for client companies. In 1960, they both left Arthur D. Little to start their own company known as Synectics, Inc., devoted to invention and research into teaching and learning processes. Gordon and Prince’s first published report on the findings into their research appeared in 1961 in *Synectics*, by William J. J. Gordon. Prince then went on to write *The Practice of Creativity* in 1973, which further elaborated on the use of metaphors and analogies in the process of generating ideas.

THEORETICAL DIMENSION OF ANALYSIS

Definition: “General principle or set of principles formulated to explain the operation of the phenomenon. Plan as to how the phenomenon works.”

Synectics is a structured approach to creative problem solving. It was developed to increase the probability of success in problem-solving situations, through the explicit process of joining together different and apparently irrelevant elements. Synectics theory maintains that:

1. Creative production increases significantly when a person understands the psychological process by which he/she operates.
2. The emotional component in the creative process is more important than the intellectual, and the irrational component more important than the rational.
3. In order to increase our creative output, we must understand these emotional and irrational components.

Synectics is based on analogical thinking and encourages the ability to live with complexity and apparent contradiction. It encourages speculation and creative behavior and its use of metaphors and analogies helps people explore their mind’s potential and gather information in order to create new solutions.

The Synectics system has been called by some an artificial vacation because it seems to let us take a holiday from the problem by not having to think about it consciously for awhile, and it encourages us to put aside our business-suit-thinking, our usual tight, analytical frame of mind; but it is an artificial vacation because while our conscious enjoys making the analogies our preconscious is hard at work on the problem. (Prince, 1969, p. 91)

According to the Synectics theory, clues responsible for productive creative thinking come from analogies brought up by the preconscious from the unconsciously stored data of past experiences. The preconscious hovers between and links the conscious to the unconscious. Synectics professes that it is not necessary to wait for the conscious mind to drift into a period of incubation before the preconscious mind can work effectively. Instead, Synectics tries to evoke the preconscious and enable individuals to oscillate between rational and non-rational views of the problem or situation. This allows users to broaden their understanding of the situation instead of narrowing it by highly logical methods. Synectics relies on a few principles, known as ‘operational mechanisms’, that draw participants of a problem-solving session into certain psychological states that are

conducive for creative production. Some of the psychological states that Gordon and Prince feel are responsible for bringing about creativity are:

- Detachment
- Deferment
- Autonomy of object
- Intuition
- Empathy
- Involvement
- Speculation
- Play
- Irreverence
- Hedonic Response

Gordon and Prince believe that these states are not operational and must be activated by mechanisms. In other words, it is not enough to instruct someone to be playful, be involved or defer judgment. These states must be induced and the mechanisms for doing so happen to be the fundamental principles responsible for propelling Synectics.

The two principles that drive Synectics and allow it to perform may be categorized together as ‘excursion’. Excursion is the term used to describe the Synectics flow because one takes an artificial vacation from the problem. The principles that allow this excursion to happen are:

1. Making the familiar strange
2. Making the strange familiar

The above two principles are also known as connection-making and connection-breaking.

Making the Familiar Strange

Making the familiar strange requires us to develop a new look at the same old patterns, problems, ideas, people, feelings, things, etc., by distorting, inverting or transposing that which we look at and are comfortable with. Synectics research highlights that break-throughs depend on “strange” new contexts by which to view a “familiar” problem. There are three mechanisms (techniques) that Synectics has identified for making the familiar strange. These three mechanisms (below) will be discussed in detail later:

- Direct Analogy
- Personal Analogy
- Compressed Conflict

Making the Strange Familiar

Individuals force ‘strangeness’ into acceptable patterns based on prior experiences or they will change their mind’s biases to make room for the strangeness. This strangeness is then converted into familiarity. This conversion from strangeness to familiarity involves three basic procedures including, analysis, generalization, and analogy.

It is important to note that the principles of making the familiar strange and the strange familiar are accompanied by a sub-principle that is responsible for allowing these two principles to carry out Synectics. This sub-principle is called “Itemized Response”. Itemized response deals with positive evaluation and first searching for the positive attributes about an idea. Itemized response enables an individual to bypass their internal “censor” which is gradually built up to protect the conscious mind from the ‘irrational’ interruptions of thought that trickle down from the unconscious by way of the conscious. As Synectics states, this censor is below conscious control and itemized response will side-step the function of this internal censor by seeking out the pros of an idea before the cons. This is essential in Synectics because of the non-rational approach and utilization of analogies that, in order for the process to be effective, we must be willing and able to tolerate; ambiguity, irrational thoughts and strangeness. Itemized response is a common principle to many creative problem solving methods.

STRUCTURAL DIMENSION OF ANALYSIS

Definition: “Arrangement or interrelation of all the parts of the whole. Manner of organization or construction of the whole.”

It can be debated whether or not Synectics is an actual creative problem solving method or process or more of a tool that may be utilized within the confines of any structured creative problem solving method. What is interesting about Synectics is that the principles that propel this process are also the tools that generate the novelty. Unlike other creative problem solving methods that house numerous tools and techniques within their framework, Synectics brings about novelty through its principles of making the familiar strange and strange familiar. While other creative problem solving methods instruct participants to engage in certain modes of thinking that allow them to generate creativity such as thinking wild, deferring judgment or playing and then use different divergent tools to generate novelty, Synectics by-passes these “guidelines” and gets right to the point by forcing participants to make and break connections. As an overview, below you will find the Synectics flow Chart as originally designed by Prince and Gordon and a more modern layout of the Synectics process as designed by Synectics, the current consulting company in Cambridge, Massachusetts.

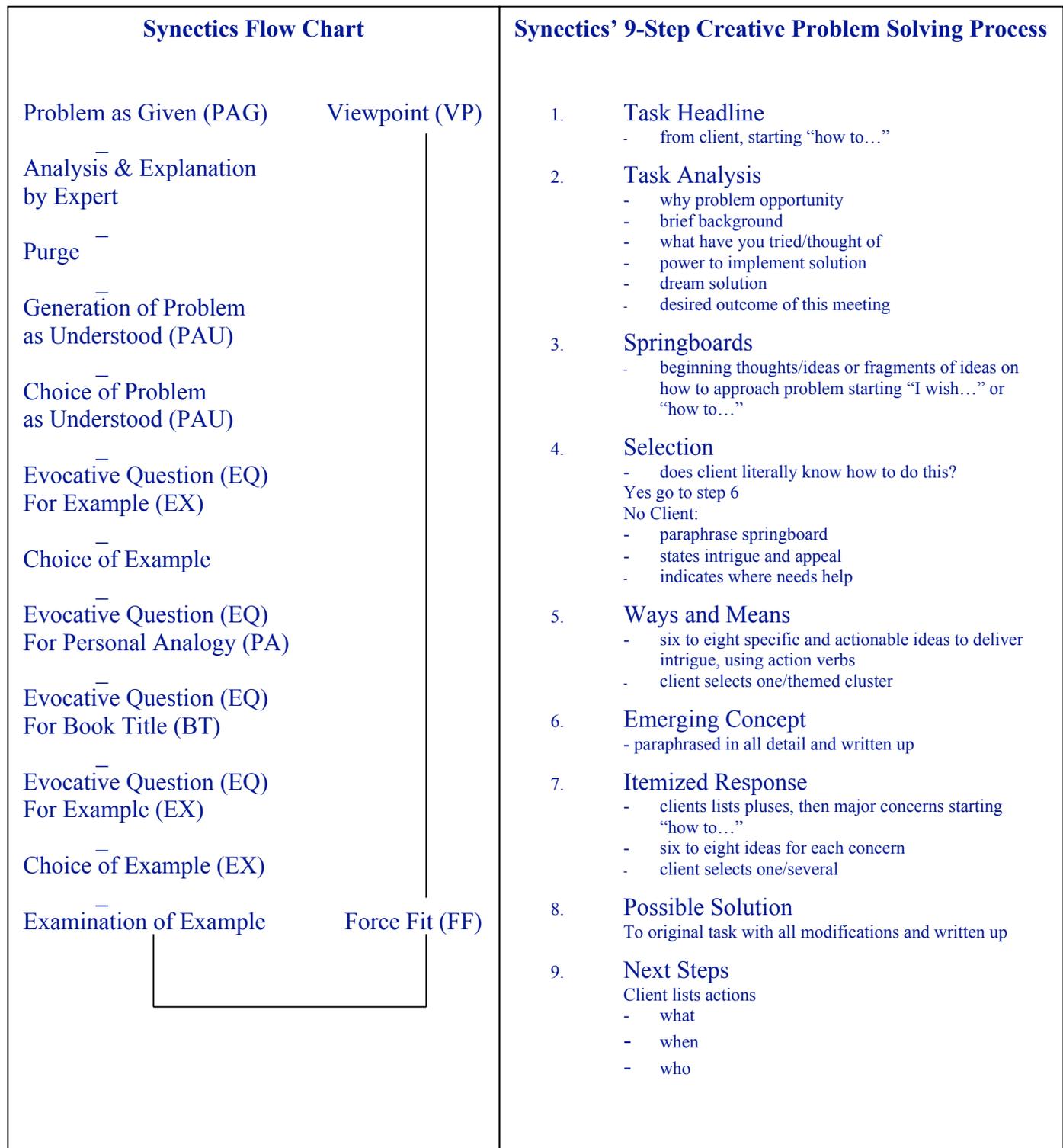


Figure 3.11

The main difference between the above processes is that they're articulated and presented on different levels of abstraction. *Synectics 9-Step Creative Problem Solving Process* utilizes 'tool' terminology, while *Synectics Flow Chart* presents the creative problem solving process on more of a conceptual basis. Other than their language, they are identical in function, with the exception that the newer version has actionable stages (#8 Possible Solution and #9 Next Steps) that allow for more convergence, solution finding and action planning than in Prince and Gordon's original version. Since these two processes are almost identical, except for in their levels of abstraction, I have provided one-holistic structural analysis for purposes of simplification that utilizes both 'languages' to describe the structural break down.

Stages

Synectics functions through a series of five broad stages. The five stages identified are described with generic language and directly reference the language and stages in the *Synectics Flow Chart*. Stage five (Developmental Thinking) will solely highlight stages within the *Synectics 9-Step Creative Problem Solving Process*, since the *Synectics Flow Chart* does not identify any action-planning steps. The five stages are as follow:

1. **Problem Framing**
 - *Problem as Given* = general statement of problem as provided by an outside source or generated by session participants
 - *Analysis & Explanation by Expert* = problem is made familiar by the expert/client (strange is made familiar)
2. **Direct Effort to Solve**
 - *Purge* = participants air immediate solutions and viewpoints
 - *Problem as Understood* = participants restate the problem as they understand it
 - *Choice of Problem as Understood* = selection of problem to work on
3. **Putting the Problem Away**
 - *Evocative Question for Direct Analogy* = comparison of one thing with another
 - *Evocative Question for Personal Analogy* = empathetic identification with something outside oneself – "If I were he..."
 - *Evocative Question for Book Title* = close coupled phrase where words fight each other
4. **Connection-Making**
 - *Examination* = select one of the analogical examples
 - *Force Fit* = example analogy is "force-fitted" to the problem in order that it may be seen in a new way
 - *View Point* = viewing the problem from several angles from which to view its familiar facts - new ideas are generated based on these viewpoints
5. **Developmental Thinking**
 - *Itemized Response* = seeking the benefits/positives of the idea
 - *Possible Solution* = solution is identified and written up
 - Next steps = client lists actions (who, what, where, when, how, why)

Phases

The phases in Synectics have been designed to make and break connections or make the familiar strange and the strange familiar. The role of Synectics is to help individuals oscillate between rational and irrational thinking and tap into our preconscious mind capabilities through connection-making and connection-breaking phases. Synectics detaches you from the problem and then brings you back to it. Although not as explicit as other creative problem solving methods, there are phases of divergence and convergence. Synectics is mostly a divergent process with convergence taking a more active role towards the end of the process.

Tools

In comparison to other creative problem solving methods, Synectics doesn't really have many tools per se, however it utilizes analogical techniques. The principles of making the familiar strange and the strange familiar are the underlying 'tools' that generate novelty through the use of direct, personal and compressed-conflict analogies. It is these analogical techniques, along with triggering mechanisms (questions) that induce the psychological states that lead us to our preconscious capabilities and prime us to generate creativity. The entire Synectics process is driven by group interaction through the use of dialogue. This dialogue is the foundation for making and breaking connections in Synectics. Synectics' techniques are as follow:

Analogical Techniques:

The following techniques 'mechanisms' allow one to *make the familiar strange*:

- Direct Analogy - the comparison of one thing with another – requires searching one's experiences and knowledge for something that is like the subject at hand

Example: illustrating the value of premium gasoline for the performance of vehicles by comparing it to the use of vitamins for the health of the human body
(premium gasoline _ performance) (vitamins _ health)

- Personal Analogy - empathetic identification with something outside oneself – role playing is often the kind of personal analogy used

Example: a mechanic may try to visualize himself being transported through an engine to help troubleshoot a peculiar problem – he identifies with the internal workings of the engine in hopes of pinpointing the problem and may say to himself “If I were a piston, what would I want in order to keep me protected, yet cool from impurities caused by intense heat?”

- Compressed Conflict - close-coupled phrase where words fight each other (also known as Book Title)

Example: involuntary willingness; balanced confusion; or connected pauses

The following procedures allow one to *make the strange familiar*:

- Analysis - process of breaking down complexity into component parts
- Generalization - intellectually identifying significant patterns among the component parts
- Analogy - seeking one’s knowledge or bank of experience in hopes of comparing it to the situation or problem

Trigger Mechanisms:

These trigger mechanisms are questions aimed at moving one from rational to irrational thinking and by-pass our internal 'censors'. Since there are many triggering mechanisms I have only provided examples to the first four.

- Subtract - remove certain parts or elements; compress or make smaller; what can be disposed or reduced?; any rules to break?; how to simplify?, etc.
- Add - extend or expand; augment, advance or annex it; magnify or add, etc.
- Transfer - move to a new situation; adapt, transpose relocate or dislocate; adapt to new frame of reference; move out of normal environment; how might subject be converted, translated or transfigured?, etc.
- Empathize - sympathize with situation/subject; put yourself in its shoes; relate to subject emotionally and subjectively, etc.

Other Triggering Mechanisms include:

Animate, Superimpose, Change Scale, Substitute, Fragmentate, Isolate, Distort, Disguise, Contradict, Parody, Prevaricate, Analogize, Hybridize, Metamorphose, Symbolize, Mythologize, Fantasize, Repeat, Combine, etc.

Again, these triggering mechanisms, along with the use of analogical techniques allow an individual to induce psychological states conducive to the generation of novelty. These questions and analogies are utilized throughout the entire process and are not home to one stage in particular because of the making the familiar strange and the strange familiar phases throughout the process.

After Prince and Gordon separated their professional relationship, Gordon, with the help of Tony Poze, one of Gordon's first students at Harvard, developed a simplified version of Synectics through SES Associates. This simplified version was described and taught through *The New Art of the Possible – The Basic Course in Synectics* (1980). Although, I have not gone into detail, I have highlighted the process for you below.

SES Associates' Synectics

This process (below) is organized in a box-model and example is given as illustrated in *The New Art of the Possible - The Basic Course in Synectics* (p. 51) and flows as such:

Problem Description

How prevent a new bike from being stolen?

Step 1 – Paradox

The bike is locked up but
The thieves seem free to take it.

–

Step 2 – Analogue

Masquerading fish because
it looks like something it is
Not.

Step 4 – Equivalent

Bike is valuable, but looks
'poisonous' to the thieves.

–

Step 3 – Unique Activity

Fish is edible but looks
poisonous to its predators.

New Idea(s)

Make the bike look 'poisonous' by painting it a poisonous, ugly color and design.

The way this process works is that you must begin by first identifying the inherent paradox in the problem. The next step is to generate an analogue (thing or situation) that parallels the paradox. After generating the analogue, step 3 requires you to define the unique activity behind that analogue. This means getting to the essence of what is the function of that analogue and then move on to step 4 and consider that unique activity in terms of the problem. Once this equivalent is generated, new ideas begin to surface.

Since not as much attention has been given to this process as the original Gordon and Prince Synectics, I merely wanted to make the reader aware of its existence and operational structure.

FUNCTIONAL DIMENSION OF ANALYSIS

Definition: *“Natural or required activity that is expected. How the method intends to perform and be useful.”*

The magic in Synectics comes from the people involved. In order for Synectics to work properly, session participants must be willing to adhere to several principles and guidelines. First, they should be able to detach themselves from the problem by way of an excursion – an artificial and induced vacation. Individuals should subscribe to the notion that the fusion of opposites through making and breaking connections brings about creativity. Synectics seeks novelty by encouraging irrational thinking skills and playing with words. Participants must be willing to make the familiar strange and the strange familiar through the use of metaphors and analogies. The encouragement of speculation is what drives this process and participants must listen and think carefully and always seek value in what others say. Without positive evaluation ‘itemized response’, the use of analogies to make the familiar strange and the strange familiar is impossible. Tolerance for ambiguity is key in Synectics.

Synectics is useful in most all problems, including people, situation or thing problems and is applicable across multiple contexts. Synectics is both an individual and group process, yet its true power comes from the diversity and participation of groups.

Roles

There are specific roles in Synectics, including the leader, expert and session participants. Below is a brief overview of these roles and their responsibilities.

- Leader - responsible for keeping the problem investigation within the confines of the process flow and ensuring maximum generation, development and use of analogical material – the leader is the dialogue guide
- Expert - person who owns the problem or challenge. The expert is responsible for providing enough detail so that there is an understanding of the problem –the expert actively participates in the generation of solutions
- Participants - session participants are responsible for committing energy and help to bring solutions to the expert’s problem – session participants must adhere to specific guidelines as previously discussed

Synectics is a powerful process in terms of generating novelty and the use of paradoxes, metaphors and analogies is more difficult than may seem. It is no easy task extracting the inherent paradoxes out of problems, generating totally unrelated direct, personal and compressed-conflict analogues in hopes of making or breaking connections

that will lead to new viewpoints and ultimately, solutions. Although many industries, such as advertising, informally tap into the use of metaphors and analogues to generate creativity, being able to consciously lead a Synectics session and guide individuals through the process of analogical and irrational thinking requires process expertise. Prior learning and hands-on experience and training should be considered for one to effectively capitalize on this creative problem solving method.

CPS – CREATIVE PROBLEM SOLVING

PHILOSOPHICAL DIMENSION OF ANALYSIS

Definition: “Logical analysis of the assumptions, beliefs and values underlying the conduct, thought, knowledge and nature of a phenomenon.”

CPS has a history of development and use over the past 50 years and is a method named after its purpose and should not be confused with creative problem solving, in the broad sense. Capital letters will signify this method. Alex F. Osborn, founding partner of advertising agency BBDO (Batten, Barton, Durstine & Osborn, Inc.), first described the CPS process in his book *Applied Imagination* (1953). Osborn believed strongly in human creative potential, the power of learning, and was enthusiastically interested in how to nurture and stimulate the human imagination in any situation, whether business or personal. A gifted writer and advertising executive, Alex Osborn concerned himself with the promotion of creativity for generating new and useful solutions and introduced the famous concept of “Brainstorming” (encouraging a free-flowing stream of ideas, while temporarily withholding all judgment).

Osborn believed that creatively alert individuals not only see what “is”, but what “might be”. He was convinced that most of us fail to be as creative as potentially we could be, because of our tendency to “drive with the brakes on.” He also believed that developing our creative potential is like driving a car with a governor on it that only permits you to drive 40 miles an hour. By removing this governor, we are then able to go 60. This does not mean that the engine is more powerful, yet, that we are able to tap the power that was there all along by ‘disconnecting’ the governor. Osborn believed in the notion that we must “stretch” beyond our own self-imposed constraints in a balanced process of first generating ideas and only later evaluating them. Osborn advocated that both imagination and judgment are essential contributors to creative productivity and promoted that they can help each other out if kept apart. As with many pioneers in the field of creative thinking, Alex Osborn felt that, in the average person, judgment grows with years while creativity dwindles unless consciously kept up. He blamed our educational system and professed that our schooling tends to train our judicial faculties and suppress our natural creative abilities.

In *Applied Imagination*, Osborn set out to provide practical explanations of the basic concepts of creative thinking and problem solving. He wrote extensively about the importance of imagination and creativity in solving problems and brought forth many basic steps to help individuals and groups become more successful in creative thinking. Osborn’s efforts and ongoing search to understand the true nature of the creative instinct in human consciousness were institutionalized in 1954 with the formation of the Creative

Education Foundation, an organization dedicated to teaching and research in creativity in all areas of life. The Creative Education Foundation has been responsible for a number of institutes and workshops, including the widely known and annual Creative Problem Solving Institute.

It wasn't until the mid-50's that Alex Osborn was joined by creativity researcher Dr. Sidney J. Parnes, who was deeply interested in investigating the impact of deliberate creative problem solving courses and instruction on the creative ability of students. In 1969, Sidney Parnes launched The Creative Studies Project at Buffalo State College, NY, which was sponsored by the Creative Education Foundation and supported by the Smith-Richardson Foundation and the U.S. Office of Education. This landmark study specifically focused on the development and evaluation of a longitudinal experimental program in creative development. Parnes' 350-student, 2-year study Creative Studies course, concentrated on the training of awareness-development, CPS, Synectics and Creative Analysis and evaluated the impact of this curriculum on various aspects of college students' behavior in class, in college, in personal life and in the community at large. Overall, students participating in these courses demonstrated significant year-to-year improvements across the majority of measures, compared with their controls.

Parnes believed that we could manipulate existing experiences and information in order to stimulate the creation of new ideas. He felt that by combining and rearranging new facts with old facts, one could get a greater number of new possible patterns of ideas. Dr. Sidney Parnes' recognized the power of Osborn's ideas and then began extending those basic concepts into a systematic approach to creative problem solving which could be used effectively in training and instruction. Dr. Parnes and Osborn expanded and organized Osborn's basic ideas of CPS into a five-step process model (Parnes, 1967). Since then, the CPS framework has been refined, developed and modified several times over the years.

THEORETICAL DIMENSION OF ANALYSIS

Definition: "General principle or set of principles formulated to explain the operation of the phenomenon. Plan as to how the phenomenon works."

CPS can be characterized as an operational model that provides a framework for specific tools and techniques that generate, evaluate, develop, refine and implement novel solutions to problems and opportunities. Noller (1979) defined CPS as follows:

By creative we mean: having an element of newness and being relevant at least to you, the one who creates the solution. By problem we mean: any situation which presents a challenge, offers an opportunity, or is a concern to you. By solving we mean: devising ways to answer or to meet or satisfy the problem, adapting yourself to the situation or adapting the solution to yourself. Creative Problem Solving or CPS is a process, a

method, a system for approaching a problem in an imaginative way resulting in effective action. (p. 4-5)

Isaksen, Dorval, and Treffinger (2000) also described CPS:

A broadly applicable framework organizing specific tools to help you design and develop new and useful outcomes. The structure of CPS provides an organizing system. Using the system involves applying productive thinking tools to: understanding problems and opportunities; generating many, varied, and unusual ideas; and evaluating, developing and implementing potential solutions. The system includes the framework of components, stages, and tools, as well as the people involved, the situation or context, and the nature of the content or desired outcomes. CPS enables individuals and groups to recognize and act on opportunities, respond to challenges, and overcome concerns. (p. 31)

CPS is propelled by a balance of divergent (imaginative or creative) and convergent (judicial or critical) thinking skills. This balance is referred to as the 'Dynamic Balance', where throughout the creative problem solving process, we alternate between divergent and convergent modes of thinking in order to generate and focus options. This dynamic balance, as Osborn originally advocated, separates imagination from judgment and encourages the most appropriate and effective use of each mode of thinking. Osborn believed that in order to become effective problem solvers we must use and enhance both our creative and critical thinking skills, proclaiming that one without the other would not be sufficient to help solve a problem. The power behind CPS is to first generate many options by tapping into our creative thinking skills and then focus those options by utilizing our critical thinking skills. This delicate balance is what makes CPS stop and go. To help visualize this balance, below I have provided an illustration:

Figure 3.12
Dynamic Balance

The dynamic balance in CPS can only be operational by deferring judgment along each step of the process, until we have exhausted all possible alternatives. Once we have exhausted all possible alternatives, we then must look to judge those options affirmatively. Maintaining the effective balance between generating and focusing is done through the use of divergent and convergent thinking guidelines. The foundational guideline for generating options (divergent thinking) is to defer judgment, where we suspend judgment and analysis until we have generated a full menu of options. The foundational guideline for focusing (convergent thinking) is to judge affirmatively, where we look for the strengths or positive attributes of an option first.

Although there are other guidelines utilized to maximize our divergent and convergent thinking abilities, what allows CPS to work at its core, is the action of separating our creative and critical thinking skills (dynamic balance). Separating these creative and critical thinking skills can only be done through the use of and adherence to deferring judgment when generating options and then judging those options affirmatively when it is time to evaluate.

Remember, these fundamental principles and dynamic balance stem from Osborn's belief that to think in creative and critical modes at the same time is like, "driving with the brakes on". CPS takes a yin and yang approach to creative problem solving.

STRUCTURAL DIMENSION OF ANALYSIS

Definition: "Arrangement or interrelation of all the parts of the whole. Manner of organization or construction of the whole."

CPS is a framework and thinking organizer for managing change and problem solving. Simply, CPS is a description of the natural stages people go through when they take on a problem for which they don't know the solution. The power in this method is that CPS's framework delicately balances one's generative (divergent) and focusing (convergent) thinking in order to overcome challenges. CPS's framework houses several components, stages, and a variety of tools that help support and operationalize both divergent and convergent phases of the process. Since there have been many revisions of CPS over time, the following structural breakdown most closely matches the language in the original Osborn-Parnes process. Most of the versions are similar and typically differ in language. For the purposes of this project, it was my intent to provide a holistic, structural break-down without focusing in on language and specific individuals responsible for CPS revisions and updates.

CPS is a multilevel structure, including two meta-components, three process components, six stages, and a variety of divergent and convergent tools. The two meta-components include *Task Appraisal* and *Process Planning*. *Task Appraisal* allows an individual to determine whether CPS is a promising method for dealing with the particular challenge at hand by gathering information related to the challenge. The purpose of *Process Planning* is to prepare for a CPS session and includes, determining the entry point into the CPS process, whether or not this will be an individual or group session, clarifying session participant roles, and other logistic preparations.

The three process components include, *Understanding the Challenge*, *Generating Ideas*, and *Preparing for Action*. *Understanding the Challenge* deals specifically with gaining a clearer focus of the problem at hand and ensures that you are working on the right problem. *Generating Ideas* does specifically just that - generate ideas. After the problem has been formulated, the focus shifts to generating many, varied and unusual

potential solutions under this component. The component *Preparing for Action* focuses on preparing and developing options for successful implementation.

Within these three components exist six specific stages that contain both a divergent and convergent phase. Understanding the Challenge contains three stages including, *Mess-Finding*, *Data-Finding*, and *Problem-Finding*. The component Generating Ideas includes the stage of *Idea-Finding*. Preparing for Action includes the stages of *Solution-Finding* and *Acceptance-Finding*. Each stage in the three process components has two phases, that when engaged accordingly, maintains the ‘dynamic balance’ mentioned earlier. These two phases include *Divergence*, where we generate many, varied and unusual options, while the other phase is *Convergence*, where we analyze, develop and refine options. Broken down even further, CPS has a variety of tools that guide one’s behavior during each divergent and convergent phase of the process.

The separation of the components and stages allows the user to effectively organize the thinking and generated data and ideas, in a phase-by-phase or step-by-step fashion. In other words, the holistic functions of CPS are to gather information, generate, evaluate/select, and develop. These functions were designed around what was thought to be the natural problem-solving steps of the human mind. Although CPS believes these to be the key steps or stages one engages when solving a problem, the order may fluctuate from person-to-person and challenge-to-challenge.

Figure 3.13 is a visual representation of the CPS process, including the two meta-components, three process components and six stages. This visual representation highlights each stage and its specific divergent and convergent purpose and phase.

CREATIVE PROBLEM SOLVING (CPS)

TASK APPRAISAL (Meta-Component) & PROCESS PLANNING (Meta-Component)

-

UNDERSTANDING THE CHALLENGE (Component)

Divergent Phase

Generate possible opportunities and challenges to consider

MESS-FINDING (Stage)

Convergent Phase

Choose one where you have ownership, motivation & need for imagination

-

DATA-FINDING (Stage)

Gather all available information, knowledge, facts, feelings, thoughts, opinions or questions regarding Mess

Identify the key or most important data

-

PROBLEM-FINDING (Stage)

Generate many, varied and unusual ways to state the problem, challenge or opportunity

Select statement that best states the issue you want to work on

-

GENERATING IDEAS (Component)

IDEA-FINDING (Stage)

Generate many, varied and unusual ideas in response to problem statement

Identify ideas that have promising potential to develop or use

-

PREPARING FOR ACTION (Component)

SOLUTION-FINDING (Stage)

Explore opportunities to strengthen and develop promising solutions

Analyze, evaluate, prioritize and refine selected solutions

-

ACCEPTANCE-FINDING (stage)

List a series of possible actions for implementation, including various sources of assistance and resistance

Formulate a specific plan of action

Figure 3.13

The components, stages and phases of CPS are supported by two major types of tools – those tools that generate options and those that analyze, develop, and refine options. CPS provides guidelines for utilizing the two types of tools. The following guidelines are responsible for engaging and modeling specific behavior that allows the tools to perform and carry out their intended divergent or convergent purposes. Below is a break out of the divergent and convergent thinking guidelines:

Divergent Thinking Guidelines

- 1) Defer Judgment - Foundation for all the generating guidelines. Postpones judgment until you have generated a full menu of alternatives.
- 2) Strive for Quantity - Generating as many options as possible. Quantity breeds quality. The more the ideas the better.
- 3) Seek Wild Options - Stretching one's thinking. Thinking 'wild' - 'Free-wheeling' is encouraged.
- 4) Seek Combinations - Suggests altering, combining, modifying or building off of previously generated options.

Convergent Thinking Guidelines

- 1) Judge Affirmatively - Foundation for all focusing guidelines. Suggests looking for the strengths or positive aspects of an option first.
- 2) Be Deliberate - Give every option a fair chance by avoiding snap decisions or harsh judgments. Avoid 'hidden agendas', prejudices and assumptions.
- 3) Seek Novelty - Actively engage and embrace novel solutions. Seek solutions that are not closely related to your original line of thinking. Go for newness.
- 4) Check Objectives - Emphasizes the importance of remembering the goal or original purpose. Keep on track and watch out for ideas that may alter your intended trajectory.

Below is a breakout of the divergent and convergent thinking tools utilized in CPS.

Divergent Thinking Tools

Brainstorming – enables an individual or group to generate many options

Brainstorming with Post-its® - enhances traditional brainstorming by increasing the number of options generated by allowing each participant to record and share their own ideas aloud

Brainwriting – a modified form of brainstorming that is more private and individualistic. Intended for use with groups where shy, quiet members are being overshadowed by more vocal ones

Forced Connections/Forced Fitting – provokes new connections between the challenge and unrelated, concrete objects

5W's and an H Worksheet – Seeks out sources of data including, information, feelings, questions, impressions, and observations through the use of who, what, where, when, why and how questions

Ladder of Abstraction – broadens or focuses the parameters of a challenge in order to generate new options by using the questions Why? and How?

Morphological Matrix – a tool that structures existing parameters of the challenge and combines those parameters to identify new ways of looking at the challenge

SCAMPER – provides stimulating questions based on six different concepts that are represented by each letter of the word SCAMPER (substitute, combine, adapt, modify, put to other uses, eliminate, rearrange)

VIR (Visually Identifying Relationships) – uses external imagery by providing the actual visual stimulus to to gain distance from the challenge

Imagery Trek – internal imagery is stimulated and individuals create their own images in order to distance themselves from the challenge

Convergent Thinking tools

Positive Evaluation Tools

- ALUo (Advantages Limitations Unique Qualities, overcoming limitations)
- LCOB (Likes, Concerns, Opportunities, brainstorming to overcome concerns)
- PPCo (Pluses, Potentials, Concerns, overcome concerns)

The above tools provide an affirmative approach to strengthen new options

Hits – a subjective process where one identifies and selects promising ideas based on experience

Highlighting – compresses options into a manageable number of themes by comparing and sorting existing options

Card Sort – helps compare, rank and prioritize promising options through the use of numerically labeled cards

Musts/Wants – groups options into two pre-determined categories based on importance

Evaluation Matrix – structured approach to compare multiple options against specific criteria

PCA (Paired Comparison Analysis) – establishes the priority of options by comparing them against each other

Criteria – criteria are generated, selected, and applied in order to screen options

SML (Short, Medium, Long) – organizes options by categorizing them along a time from short to long term

Assistors & Resistors – identifies and lists all sources of assistance and resistance onto a worksheet. These sources of assistance and resistance are separated across who, what, where, why, when, and how categories

Figure 3.14

CPS's operational framework will allow one to utilize any number of divergent and convergent thinking tools. Due to its flexible and non-linear structure, CPS may act as a host creative problem solving method and include parts of other methods within its framework. The organizing framework that dynamically balances divergent and convergent thinking allows CPS users the flexibility to utilize the entire process in a linear fashion or simply use CPS in pieces – by component, stage, phase or tool.

FUNCTIONAL DIMENSION OF ANALYSIS

Definition: *“Natural or required activity that is expected. How the method intends to perform and be useful.”*

CPS claims that most everyone uses roughly the same process to go about solving problems. What makes CPS so effective is that it makes this natural problem solving process explicit so that people know where they are, where they are going and how they should go about getting there. Its framework ensures that people don't get lost in the problem itself. The power behind CPS is in its dynamic balance of divergent and convergent thinking along each stage of the process. The harmonious relationship and teamwork between divergent and convergent thinking must be maintained throughout each stage of the process for CPS to perform. Maintaining this dynamic balance requires that group members adhere to and internalize the principle of deferring judgment when generating options and judging affirmatively when focusing options.

While CPS is a form of problem solving and is universal in its application, it specifically seeks to generate novelty and can help to solve nearly any type of problem. Understanding whether or not CPS is a good fit for a problem is key. CPS seeks clients (owners of the problem in a CPS session) that have the responsibility and decision-making authority concerning the challenge, the motivation to carry out the challenge to implementation and clients who specifically need new, imaginative and creative solutions. Since CPS is also effective in individual applications, it is important to ensure that the above three criteria are met before utilizing CPS. In group settings, the 'client' is one of three distinct roles required to carry out CPS. These roles include:

Facilitator - Is the process expert responsible for monitoring group process, including idea flow, group development and logistics. Make the process decisions based on feedback from the client. Facilitator is the process guide only and does not contribute ideas or help converge on ideas.

- Client - Primary owner of the challenge (content). Client can be an individual or group. Client is responsible for sharing relevant background data, generating ideas along with the resource group and selecting those solutions that best address the challenge.
- Resource Group - Member of the session responsible for providing ideas, energy, insight and different perspectives in order to serve the client's needs.

Deciding whether or not to use CPS and where, if so, to begin the process is critical to the success of CPS. Diagnosing the situation allows an individual to make decisions about whether to use CPS and where exactly to enter the process. This is done by appraising the challenge at hand through a series of questions, in the form of an interview. This client interview serves the purpose of gathering information related to the challenge and specifically to discover if there is ownership of the challenge, a need for novelty, situation surrounding the challenge and costs and benefits of using CPS.

Although Creative Problem Solving is both an individual and group process, its true power resides in the diversity and different perspectives it elicits from group participants. Prior learning and hands-on experience are required in order to successfully facilitate a CPS session. Because of its flexible structure and operational model, individuals may utilize CPS's entire process in linear fashion, or simply utilize specific stages, along with their corresponding divergent and convergent phases and supporting tools.

SECTION 4

Evaluation of Findings

INTRODUCTION

Section 3 specifically outlined the raw findings for each creative problem solving method across philosophical, theoretical, structural and functional dimensions of analysis. Section 4 compares these three methods across each dimension of analysis, including specific strengths and areas of opportunity for each method. In addition to the philosophical, theoretical, structural and functional dimensions of analysis, Section 4 also addresses the efficacy dimension of analysis. Section 4 concludes with a summary of key learnings, implications and recommendations.

As with each individual method's analysis in Section 3, this section begins by comparing the similarities and differences among the philosophical dimension of analysis, followed by theoretical, structural, functional and finishing with efficacy.

It is important to first review the questions that guided this study before proceeding to the evaluation of the methods. The questions were as follow:

- What are the key philosophical, theoretical, structural, and efficacy dimensions that comprise the CPS, Synectics and Lateral Thinking creative problem solving methods?
- In what ways are these methods similar and/or different based upon these comparative dimensions?
- How might an evaluative comparison of these methods benefit practitioners?

The first question was answered in Section 3, with the exception of the efficacy dimension of analysis, which is discussed in Section 4. The second question is answered in the following evaluation of each dimension of analysis and the last question is addressed within the subsection titled "Implications and Recommendations."

BEGINNING WITH THE END

You will notice, and possibly be surprised, how similar these methods truly are across several of the dimensions investigated in this study. It is the level of abstraction and the creator's articulation and 'packaging' that seems to set them apart. In truth, these

creators were all fighting the same fight and with relatively the same approach. Of course there are plenty of differences among these methods as will be highlighted in the pages to come. However, many times in life we allow ourselves to be lured into thinking a certain way or buying into something that isn't necessarily reality or isn't everything that the creators claimed it to be. I trust that the following evaluation will provide you with enough information so that you better understand that which you are buying and becoming a part of. The intent is for this information to make you intimately familiar with each of these methods.

At times, we, as imperfect beings, unconsciously tend to become 'cultish' in our beliefs and behavior. We may base our ideology on blind faith and then cling, with a vise-like grip, to the sign posted 'my way or the highway'. Why is this? Why must we place all of our eggs in one basket and throw the baby out with the bathwater when we find something isn't everything we thought it was? We do ourselves an injustice by not moving beyond the appearance and illusion of things to see the matrix in the background - to see just how, why, what, where, when, and who? Unfortunately, many of us are too quick to judge and look for that quick-fix or silver-bullet approach to 'solve all' and we forget to take a step back and understand things and processes at their core – their purest essence – their heartbeat. This is where research and critical analysis helps to bring clarity and truth to complexities, ambiguity and ill-structured and impure intents in life.

It was my intent to provide you with an in-depth breakdown of information so you can 'feel' these methods and understand what makes them stop and go. I set out to help illustrate the similarities and differences between these methods. Many of you may be looking for substantiation and ammunition that 'your way' or 'method' is stronger or better than the next and then utilize this research as a selling point to wave your flag high and proud...and that's ok. I would say this though...there is no one right way and all of these methods have their pros and cons...my job here was to make you a well-informed consumer. My goal was to provide you with the truth and act as the '*creativity consciousness*'. I guess you could say that I'm a concerned citizen who wishes to set the record straight, and will do so in the thoughts and evaluation that follows. I will elaborate more on this subject after the breakdown of the dimensions of analysis.

It is important to now move beyond the 'barriers' of language, not only in this dimension of analysis, but in all of them and realize that I have taken certain liberties in presenting this information in the most simplistic and general form possible. What does this mean? It means that I have extracted the essence of each method by sifting through their proposition to the world – looking at how they have served up what they offer to society. I've looked at their 'presentation' and 'packaging' in terms of language and levels of abstraction to understand if what these creators were saying was really different or in alignment with one another and just wrapped up differently and either consciously or unconsciously disguised in language and presentation...for whatever reason. My goal was to bring clarity and truth to the 'un-aware' eye and do so through a thorough, yet easily digestible synthesis.

PHILOSOPHICAL DIMENSION OF ANALYSIS

Definition: “Logical analysis of the assumptions, beliefs and values underlying the conduct, thought, knowledge and nature of a phenomenon.”

As I mentioned in Section 2, I felt it was important to include this dimension of analysis to provide some history and background for each method, and in particular, why and how each method originated. I also stated how important it is to feel the ‘soul’ of things in life. All too often, we seem to be creatures of ‘doing’ without first understanding and feeling the pulse of things. It is necessary to move beyond the appearance of something and realize why and how it came into being...it makes us stronger in the end and quicker on our feet. Seeing things from this philosophical perspective provides us the opportunity to identify, one-on-one with the creator and in turn, stand firmly when challenged to respond to the beliefs, values, integrity, purity and purpose of each method.

Edward de Bono, William J. Gordon and George M. Prince, and Alex F. Osborn and Sidney J. Parnes all share similar philosophical beliefs and values as they relate to the world of creative thinking and creative problem solving in general. It is critical at this juncture to separate the Why? from the How? It is important to first understand the similarities and differences behind what motivated these creators to do what they did and then understand just how they went about doing so.

Why?

These individuals all shared fundamental beliefs and were motivated by many of the same desires and dissatisfactions. All of these creators believed that creative thinking and creativity in general, could be both taught and learned. They all professed that to enhance our creativity and thinking skills in general, we must take deliberate and organized steps to doing so and we must take them in a disciplined manner. They believed in human creative potential and were concerned with teaching people *how*, and not *what* to think. They all set out to enhance our thinking abilities and moved to make us a more generative and creative versus critical and constructive thinking society. These creators felt that our judgment grows with age while our creativity dwindles. They adamantly blamed our educational system, professing that our schooling tends to train our judicial faculties and suppress our natural creative abilities and processes. With this, these individuals all shared the viewpoint, in one way or another, that people must be trained to think consistently about “what might be” versus “what is”. They all fought the intelligence versus creativity debate, claiming that without creativity or imagination we will never reach our potential as thinkers and problem solvers. Finally, and most importantly, these creators insisted that the very qualities that make the mind useful also inhibit its ability to think creatively.

How?

The invaluable and useful function of the mind to create patterns is the same function that these creators felt must be tricked and altered if we are to invite and generate new and creative thinking. It is the deep and rigid patterns of the mind that must be broken, side-stepped, manipulated or crossed in order to entertain ideas that are foreign to the “rules” of the mind.

Edward de Bono thought that we needed new thinking processes that would allow us to divert from these deeply entrenched patterns into side patterns that enable us to bring about creativity and the generation of new ideas. Dr. de Bono also claimed that these new processes needed to help individuals think in only one ‘mode’ at any given time. This line of thinking gave birth to the concepts of Lateral Thinking and Parallel Thinking.

William Gordon and George Prince sought to provide deliberate steps to change our behavior and learn to adopt and become curious about the new and strange. This thinking served as a pillar into their introduction of making and breaking connections in Syntectics. Specifically, they sought to help people make the familiar strange and the strange familiar.

Alex Osborn was concerned with helping individuals “stretch” beyond their own self-imposed constraints in a balanced process of first generating ideas (brainstorming) and only later evaluating them. The act of separating these two modes of thinking served as the foundation for the basic principles in Creative Problem Solving. Dr. Sidney Parnes believed that we could manipulate existing experiences and information in order to stimulate the creation of new ideas. Together they helped to refine Osborn’s original concepts and ideas and provide a systematic framework for generating and focusing options.

In conclusion, these creators were aligned in their beliefs into the need for deliberate thinking processes that would specifically enhance our creative thinking abilities. How they chose to design and operationalize these processes is where, from a philosophical standpoint, we begin to see subtle differences. These differences will become more apparent as we ratchet down the levels of abstraction, beginning with the theoretical dimension of analysis.

THEORETICAL DIMENSION OF ANALYSIS

Definition: “General principle or set of principles formulated to explain the operation of the phenomenon. Plan as to how the phenomenon works.”

Understanding the theory behind a phenomenon allows us to get to the heart of matters and realize how, exactly, something operates. Better yet, understand that which is responsible for operating it – its ‘heartbeat’ or ‘lifeline’. Of all the dimensions of analysis in this project, theoretical comprehension is a must. For what good are we to ourselves, our clients, students, children, etc., if we really do not understand the fundamental principles that make these methods go round? It’s no easy task moving behind the appearance of something and challenging what seems to be simple and obvious on the surface. It requires a critical eye and turning a deaf ear to blind faith. Just as we gain holistic perspective as we take a chopper to 10,000 feet and see just how simple, peaceful and uncomplicated the landscape is, we must also step back from the massive bodies of work generated from these creators and ask ourselves “what’s really going on here and what makes these things stop and go?”

Surprisingly enough, these creative problem solving methods are all propelled by the exact same principles. Differences in language and levels of abstraction aside, these creators relied on just a few principles that would help them operationalize their methods to bring about change, novelty and new perceptions. The principles common in all three methods happen to be the deferral of judgment and affirmative judgment. Each method also relies on one another principle or sub-principle to allow the method to perform. A breakdown of these principles follows:

CPS

Creative Problem Solving is propelled by a balance of divergent (imaginative or creative) and convergent (judicial or critical) thinking skills. This balance is referred to as the ‘Dynamic Balance’, where throughout the creative problem solving process, we alternate between divergent and convergent modes of thinking in order to generate and focus options. What allows CPS to work at its core, is the action of separating our creative and critical thinking skills (dynamic balance). Separating these creative and critical thinking skills can only be done through the use and adherence of deferring judgment when generating options and then judging those options affirmatively when it is time to evaluate. Bulleted, these principles are:

- Dynamic Balance (separation of creative and critical thinking)

Can only be accomplished by adhering to the following principles. These are responsible for engaging and modeling specific behavior that allows CPS’s tools to perform and carry out their intended divergent or convergent purposes

- Deferral of Judgment - adhered to when generating options
- Affirmative Judgment - adhered to when focusing options

Synectics

This method operates off of the fundamental concept of “Excursions”. The principles that carry out these excursions are to make the familiar strange and the strange familiar. These principles encourage the ability to live with complexity and apparent contradiction. Taking these excursions requires a great deal of deferring judgment and welcoming ambiguity and irrational thinking. Synectics is also propelled by ‘Itemized Response’, which is the same thing as affirmative judgment and deals with positive evaluation and first searching for the positive attributes about an idea. The principles again are:

- Excursions (taking artificial vacations through the use of analogues)
- □ Making the Familiar Strange
- □ Making the Strange Familiar

The principles of making the familiar strange and the strange familiar are operationalized through the use of deferring judgment and judging affirmatively (itemized response).

Lateral Thinking/Parallel Thinking

The main principles responsible for allowing Lateral Thinking to perform are Provocation and Movement. Provocation allows our mind to get out of the established track and with movement we move forward from the new track. Although de Bono maintains that movement is different than deferring judgment, it really isn’t. It’s just a fancy label and works the same way as deferring judgment. The Lateral Thinking principles are:

- □ Provocation
- □ Movement

The principle that drives Parallel Thinking (Six Thinking Hats) is organization of thought. Parallel Thinking promotes that we must organize our thinking and try not to engage in too many trains of thought all at the same time.

In conclusion, none of these creative problem solving methods would perform without the principles of deferring judgment and affirmative judgment. Synectics and Lateral Thinking share a principle, which just happens to be wrapped around different language. Taking excursions and making the familiar strange and the strange familiar is what de Bono refers to as provocation. The more we can provoke the mind, the more we are able to cut across old patterns, beliefs and bodies of experience in order to generate novelty and adopt new perceptions.

STRUCTURAL DIMENSION OF ANALYSIS

Definition: “Arrangement or interrelation of all the parts of the whole. Manner of organization or construction of the whole.”

This dimension of analysis was created in order to clarify the manner of organization and construction of the whole of each method in relationship to its parts. Moving now into a lower level of abstraction and comparing these methods against each other from a structural perspective gets tricky. It’s tricky because these methods are quite different from each other in terms of their process and what they actually accomplish. It is important to realize that it would be foolish to say, “well, CPS is much better than Syntectics or give me Edward de Bono’s stuff or give me death.” We must put an end to this “us-against-them” mentality and understand how powerful each of these methods can be if used properly. I believe that we should use all of them. Mix them up and use the pieces of each if need be. It is the process aware individual who stands apart from the rest of the pack. This means the more familiar we become with processes, the bigger our bag of tricks. As we familiarize ourselves with foreign methodologies, we begin to pull and take what we like from each. There is and never will be one right way. It is those individuals that can design an intervention through a hodgepodge of structures, components, stages, phases, tools and techniques that will successfully create and sustain change.

These methods all share the same holistic purpose of generating novelty, organizing and balancing our thinking, and creating change. It’s the differences that I want to zero in on. We need to understand how these differ along the lines of whether or not they are an actual creative problem solving method.

Lateral Thinking

Lateral Thinking is not a complete creative problem solving method, rather a philosophical approach to changing concepts, patterns and perception, which happens to be supported by thinking techniques. Lateral Thinking explains at a very high level of abstraction that we must seek to provoke the mind to help us cut across patterns and free ourselves from our own knowledge and experiences and create the newness that is required to resolve our challenges. Edward de Bono has done a masterful job of selling in the “Why” to creativity through his philosophical packaging. In fact, I have yet to read and experience such an eloquent and convincing proposition to why we need to think differently. Without a doubt, de Bono has served the field of creativity well and should be considered one of the many solid pillars that have helped to springboard the field of creativity and thinking forward.

What does Lateral Thinking really mean? I’ve heard people at creativity conferences proudly say, as if it were to set them apart from the rest of us mortals, “oh

yeah, I'm a lateral thinker!" Well, so what? Who cares? Anyone in the field of creativity is a lateral thinker. Lateral Thinking, like the word creativity or creative thinking serves as an umbrella for what we all do. We all think laterally, just as we all make the familiar strange and the strange familiar, take excursions, we all brainstorm and we all balance our divergent and convergent thinking in one way or another. Big deal. You see, language has a way of creating confusion and by this point in the project we should be aware of the fact that at a philosophical and theoretical level, these creators were all saying the same thing...they just articulated it differently. Let us not confuse the real meaning of Lateral Thinking.

When we boil Lateral Thinking all down, we're left with thinking techniques. Lateral Thinking is not a full thinking process that helps solve problems on a full scale. It does however do an excellent job in the area of divergent thinking and its provocative approach generates novelty as well as any other method. Just what to do with the generated novelty is where Lateral Thinking falls short in terms of evaluation, refinement and implementation. These thinking techniques, if arranged properly may function as a process. Unless trained in Lateral Thinking, one may not understand just how to arrange these techniques in order to meet the objectives of the task at hand.

Dr. de Bono has never shown a complete process where these techniques are intimately woven together in a complete process that generates, evaluates, develops, refines and implements novel solutions to problems. I'm not sure that de Bono had wanted to do this originally and I feel that the way he conceptualized his work was to bring a bag full of thinking techniques to the world. The benefits of these nicely packaged techniques are overly promised. Again, the philosophical and theoretical fire-power behind Lateral Thinking is unbelievable, yet the techniques cannot live up to and support the claims of the proposition. So what we have is a powerfully convincing and logical sell-in and 'packaging' to why we must think differently, followed by a huge gap and then the thinking techniques. Edward de Bono's philosophical sell-in and proposition is so strong and sexy that it seems that the 'philosophical approach' in and of itself, is what draws people in to Lateral Thinking. What happens though is that the strong sell-in is then met by an operational gap and somewhat repetitive and overlapping techniques.

What's interesting is that Lateral Thinking is supported by techniques and not tools. The difference is that techniques allow us to do something in a certain manner or method and tools allow us to realize the end result through an actual working element or implement. Techniques, as with Lateral Thinking, tell us to go about something in a certain manner and tools provide us the working structure to bring about the desired result. The techniques that de Bono has designed in order for us to think laterally, really don't have much substance in that they do not provide us with a structured flow or organized framework that generates, evaluates, refines and helps to implement solutions. His philosophical sell in makes sense and is crystal clear, but the questioning exercises that make up the thinking techniques are questionable in and of themselves.

A quick scan of de Bono's thinking techniques and you will notice the repetitive nature of their purposes, and realize that their design has not allowed enough clear differentiation between them. There is much overlap between the Lateral Thinking techniques and the Direct Attention Thinking Tools (DATT). Many of the DATT and Lateral Thinking techniques share similar purposes and it seems unnecessary to have more than one tool or technique for the exact same purpose. I'm not sure whether or not this was a conscious or unconscious decision. If it were conscious, it may have been so through the belief in the notion "more is more". In other words, was the duplication of these techniques a result of trying to build a 'bigger' portfolio? For added marketing muscle? We must question these things. I believe that the techniques that de Bono offers, along with the lack of an organized process, leaves the user somewhat 'high-and-dry'. Simply put, the thinking techniques in Lateral Thinking are sporadically laid out without a sequence and true process. Moreover, I feel confident in saying that these techniques, in and of themselves, are not strong enough to truly carry out the philosophical 'packaging' of Lateral Thinking. The process is missing and without a process one is left with sporadic array of techniques.

\Parallel Thinking

In terms of process and a creative problem solving method, Parallel Thinking, as carried out by Six Thinking Hats, does provide a solid structure to the organization of thinking. Six Hats ensures that we do not engage in too many modes of thought all at the same time. The sequence of the hats can make or break this tool. You need to rework the order of the hats according to your goals. For example, you may just want to explore the value and difficulties of an idea during a session and therefore you would use the yellow and black hats. In the next session you may only need to generate ideas and therefore utilize green hat thinking.

Parallel Thinking + Lateral Thinking

After becoming intimately familiar with all of de Bono's work, I realized that it is necessary to combine Lateral Thinking, Six Thinking Hats and DATT in order to create a creative problem solving method that can flow within a structured framework. Six Thinking Hats, in and of itself, functions well as a creative thinking process because of the five modes of thinking (creative, positive, critical, emotional, informational) that are triggered and explored through the use of the Blue hat (facilitator). On the surface, Six Hats seems to be more of a tool than a thinking process. It is in fact a transparent process that may or may not yield the same results as other organized creative problem solving methods. It seems that de Bono, for whatever reasons, never took the time to analyze all of his work and show us how it is all connected, through principles, components, stages, phases, and techniques and tools.

Synectics

It can be debated whether or not Synectics is an actual creative problem solving method. Without a doubt, Synectics will probably get you the quickest "aha" and

greatest degree of novelty of these three methods. Just what to do with the novelty is questionable. As originally developed, Synectics didn't really have a back-end mechanism to the process that would help in terms of evaluating, refining and implementing solutions. Synectics, as now managed by the corporation Synectics, Inc. in Boston, MA, does show solution refinement and action planning stages. However, since I am not a trained Synector of this corporation, it is difficult to tell exactly what tools and techniques allow these stages to perform.

Unlike de Bono's work, Synectics offers clear and understandable stages, phases and tools. It is probably the most powerful divergent thinking process in terms of generating novelty. It's use of analogues forces contradictions and the end result is usually revolutionary. The stages in Synectics concentrate on the upfront divergent thinking needed to generate novel options. While CPS and other creative problem solving methods instruct participants to engage in certain modes of thinking that will allow them to generate creativity, such as thinking wild, deferring judgment or playing, Synectics by-passes these thinking 'guidelines' and gets right to the point by forcing you to make and break connections. Synectics believes that people have to be induced into these psychological states that set the tone for great divergent thinking. Synectics is probably not for everyone because its high degree of and use of 'irrational thinking' along each making the strange familiar and the familiar strange phases. Synectics detaches you from the problem and then brings you back to it. This detachment is not for everyone and requires a high tolerance for ambiguity on behalf of session participants. What's interesting is that Synectics doesn't really have many tools per se, rather it uses analogical techniques to generate novelty. The principles of making the familiar strange and the strange familiar are the underlying 'tools' that generate novelty through the use of direct, personal and compressed-conflict analogues. These analogues are operationalized through group dialogue where the leader asks questions called triggering mechanisms that induce the psychological states that Synectics is after.

To provide some perspective, let me explain the power behind the principles that guide Synectics. Having come from the world of advertising, I believe that the use of analogues is a natural and transparent process. Advertising executives rely on forcing opposites and drawing analogies by watching director's reels, commercials, scanning magazines, flipping through stock photography books and constantly tinkering with a diverse bodies of experiences and knowledge. The novelty generated in advertising is through the making and breaking connections...the underpinnings of Synectics.

Creative Problem Solving (CPS)

What sets CPS apart from Synectics and de Bono's work is that Creative Problem Solving is no more than a description of the natural stages people go through when they take on a problem for which they don't know the solution. The power in this method is that CPS's framework delicately balances one's generative (divergent) and focusing (convergent) thinking in order to overcome challenges. CPS's framework houses several components, stages, and a variety of tools that help support and operationalize both divergent and convergent phases of the process.

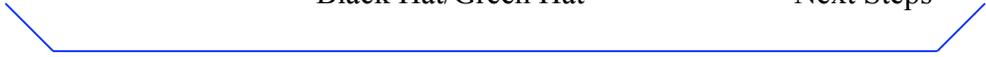
CPS is a multilevel structure that can be characterized as an operational model that provides a framework for specific tools and techniques that generate, evaluate, develop, refine and implement novel solutions to problems and opportunities. In comparison to Synectics and de Bono's Lateral Thinking and Parallel Thinking, CPS helps to navigate the user from problem clarification and idea generation to final refinement of solutions and implementation. CPS also differentiates itself from Synectics and de Bono's work through its explicit task appraisal and process planning meta-components on the upfront end of the process. CPS's operational framework will allow one to utilize any number of divergent and convergent thinking tools. Although probably the strongest thinking organizer of the three, CPS may not generate as much novelty as the other methods. CPS does not force opposites as strongly as Synectics and de Bono's provocation techniques.

Where CPS has thinking 'guidelines', Synectics and de Bono feel that it is not enough to just tell someone to defer judgment for example. This psychological state needs to be induced more so than just writing it on a flip chart and telling someone to behave accordingly. I feel that this is what makes CPS the 'safest' method of the three. However, depending on the tools and techniques utilized, CPS can provide radical and high degrees of novelty.

Due to its flexible and non-linear structure, CPS may act as a host creative problem solving method and include parts of other methods within its framework. In fact, many of the tools within the CPS portfolio have come from other methods such as Synectics. CPS offers the most holistic creative problem solving framework and can easily incorporate many of the Lateral Thinking techniques and all Six Hats within the different stages of the process. The organizing framework that dynamically balances divergent and convergent thinking allows CPS users the flexibility to utilize the entire process in a linear fashion or simply use CPS in pieces – by component, stage, phase or tool.

Framework and Stage Comparisons

Figure 4.0

CPS	SIX HATS	SYNECTICS
Mess-Finding	Green Hat (Creativity)	Task Headlines
Data-Finding	White Hat (Information/Facts) Red Hat (Feelings/Emotions)	Analysis & Facts
Problem-Finding	Green Hat (Creativity)	Springboards & Selection
Idea-Finding	Green Hat (Creativity)	Ways and Means
Solution-Finding	Yellow Hat (Benefits/Value) Black Hat (Judgment/Caution)	Itemized Response
Acceptance-Finding	Yellow Hat (Benefits/Value) Black Hat/Green Hat	Possible Solution & Next Steps
 <p>Process Guidance</p>		
Facilitator (Person)	Blue Hat (Person)	Leader (Person)

And The Winner Is...

We have come to a point in this project where we should all know that there is no winner. The philosophical, theoretical and structural dimensions of analysis have provided enough information to understand that these methods cannot necessarily be ranked against each other, in hopes of selecting one ‘global’ winner. These methods’ distinct points of differentiation make them all winners. Instead of concerning yourself with the “one” or “better” method, you should ask yourself...am I process aware? Do I know what I’m after? What is it that needs to be taken into consideration in order to realize my goals? Do I truly understand the power of these creative problem solving methods?

For the most skilled facilitator and problem solver will have knowledge of all of these methods and utilize them in their totality or pieced together depending on the demands of the challenge. One size does not fit all and there certainly is more than one-way to skin a cat. Individuals in the field of creativity seem to get caught up on language and defend something by whether or not it may be deemed a process or a method or whatever. Who says that a full process is better than a handful of sporadic techniques? Or is it better to stay away from structured frameworks and facilitate transparently? Who knows? What is the task at hand? There is a time a place for everything and it behooves you to have a thorough understanding of all of these methods so that you can better design your own interventions.

FUNCTIONAL DIMENSION OF ANALYSIS

Definition: “Natural or required activity that is expected. How the method intends to perform and be useful.”

The functional dimension of analysis was included in the study to better understand the natural activity that is expected to happen in order for each method to perform. We need to understand all the of the requirements such as roles, responsibilities, procedures, expectations, training, learning, universality of application and other logistical activities required in order for each method to be useful.

All of these methods require the same activities in order for them to perform and be useful. Since these methods specifically seek to generate novelty through unconventional means, it is imperative that the problem owner has a need and desire for novelty. A specific intent to seek novel solutions will allow these methods to perform at their maximum and serve their true purpose. This means willing to provoke, alter, modify, trick and stretch our thinking through irrational and illogical ways. It means willing to break patterns, take excursions, think in only one mode at a time and do so by deferring judgment when generating options and judging affirmatively when focusing

options. Living these principles allows us to enter the psychological states that are conducive to fluid, flexible and original generation of ideas.

It is important to note that these methods are intended for both individual and group application. However, because of its structured framework and separation of divergent and convergent thinking, CPS allows for a more individual-friendly process. CPS seems to guide an individual throughout the process much easier than both Synectics and Six Hats. Although Six Hats does an excellent job of separating one's thinking, it doesn't provide the variety and depth of tools that help to generate and focus potential solutions, as does CPS.

In terms of group application, these three methods require specific roles that can be generally categorized as the group facilitator or leader, the client and the resource group or participants of the session. The facilitator is the process guide and controls and organizes the group's thinking. The client is the owner of the challenge and responsible for sharing background information. The resource group is responsible for providing energy, insight and ideas to better help the client overcome his/her/their challenge. In terms of application, these three methods are universal and may help to solve a multitude of problems. As with anything, prior learning and hands-on experience and professional training should be considered for one to effectively capitalize on these or any creative problem solving methods.

Deciding whether or not to use a specific method and where, if so, to begin the process is critical to the success of creative problem solving in general. Diagnosing the situation allows an individual to make decisions about whether to use one method over another and where exactly to enter the process. This is done by appraising the challenge at hand through a series of data-finding questions. Interviewing the client serves the purpose of gathering information related to the challenge and specifically to discover if there is ownership of the challenge, the need for novelty, the situation surrounding the challenge and costs and benefits of using one method over another. Because of their purpose, these methods have no functional differences among each other. This speaks well of each method and demonstrates their disciplined, deliberate and formalized approach to solving problems.

EFFICACY DIMENSION OF ANALYSIS

Definition: “Power to produce intended results.”

Do these creative problem solving methods really make a difference? Do they have the power to produce the results they claim?

Not much exists in the way of research, especially in a manner that would effectively compare each method, in its totality, against one another. Currently, trying to compare each method’s efficacy against one another is like comparing apples to oranges. Most of the research that has been conducted to date deals specifically with divergent thinking phases or tools and techniques within each method and not the entire method itself. Moreover, the worth and validity of experimental studies on creativity training have been questioned on account of their use of divergent thinking tests to evaluate effectiveness (Manfield, Busse, and Krepelka, 1978).

The efficacy dimension presents two challenges to understanding the effectiveness of these methods from a research standpoint. First, is the fact that the majority of all testing within the field of creativity research has focused solely on the divergent phases and tools and techniques within any specific method and not testing the method in its entirety as a ‘process’. Second, the actual testing of these creativity-training programs happen to only measure effectiveness for the criteria of divergent thinking. Torrance and Presbury (1984) found considerable evidence of the use of more “real life” criteria to measure creativity effectiveness, such as through the evaluation of creative products, behavior and self-evaluation. Although, there seem to be no studies that do direct comparisons across these methods, there are many studies of the impact of training in CPS and other methods as a whole process. The Creative Studies Project, research on the effectiveness of CPS training, is a great example and should be looked at in terms of designing future studies. For the purposes of demonstrating measurable research strength in terms of validity and reliability, future studies would have to be designed with ‘process indicators’ instead of just ‘divergent thinking indicators’.

It cannot be said whether or not the CPS ‘process’ is better or worse than Synectics or Lateral Thinking/Six Hats because there is no information that truly takes a process approach to research, and at the same time does direct comparisons among these methods. To effectively measure and compare the power of these methods against one another will require an intense ‘process study’ (divergent and convergent thinking) that would consider the use of non-psychometric criteria to gauge their effectiveness.

Based on the total number of available research studies, CPS by far outweighs the other two methods. Again, the majority of these studies zero in specifically on the effectiveness of brainstorming and other divergent thinking tools. Creative Problem Solving has a long history of study and is the only method that continues to be studied

both in the business and academic worlds. Buffalo State College in Buffalo, NY offers a Master's of Science degree in Creativity and dedicates one-third of the entire degree to the practice and research of Creative Problem Solving.

Although there were initial studies on the benefits of Synectics, current research is now proprietary and under lock and key in Boston, MA with the corporation Synectic, Inc. It is not known what research is currently being administered, if any at all, and whether or not it happens to be taking place in business, academia or both. It is unfortunate that such a powerful and beneficial method as Synectics, has closed the door to public availability. Edward de Bono, as he told me in an interview in October of 1999, doesn't really care to research his work. In academic settings, very little exists in the way of his research. Most of his studies show business results and are anecdotal in nature. In my interview with Dr. de Bono, he mentioned,

It's really not an interest of mine to publish work and case studies that demonstrate measurability and results, although it certainly exists, or have to justify my work among academia. Research tends to be so artificial...nobody has been able to prove that literature, history or mathematic classes have prepared people for society. The skills of action are every bit important as the skills of knowledge. We neglect them completely and turn out students who have little to contribute to society.

The efficacy dimension of analysis exists so that we do not dismiss the validity and reliability of these methods. There are no studies that specifically have set out to compare these three methods and do so by comparing the effectiveness of their process. These three methods are being utilized around the globe and with identifiable, anecdotal success. There will never be any shortage of anecdotal evidence and this is precisely why I have chosen not to discuss it here. Who wouldn't say great things about their method and prepare fancy case studies to tout their effectiveness? A need for deeper research exists along the lines of efficacy and it is my hope that future studies will address this need.

LEARNINGS

It was my intent to provide the field of creativity with a complete breakdown of these three creative problem solving methods. The breakdown of these methods was in-depth and ran up and down different levels of abstraction. I never thought I would learn so much about process from an analytical evaluation. Although the content learnings proved to critical, I realized how much there is to learn about process through a pencil-and-paper exercise. Furthermore, my analytical thinking skills have improved ten-fold and I now find myself tearing things apart, no matter what they may be, on different

levels of abstraction – philosophical, theoretical, structural, functional and efficacy. This has been an added bonus that I hadn't expected.

I feel that I have enriched my process portfolio and will utilize these methods in whatever way I feel will benefit the intervention at hand. I was also reminded about the importance of problem clarification from the standpoint of the facilitator. A proper diagnosis is half the battle. Knowing just what process, tools or techniques to bring to the table will avoid intervention crashes. Finally, the notion of “there's more than one way to skin cat” has been deeply ingrained into the fabric of my being.

IMPLICATIONS AND RECOMMENDATIONS

This project idea came to me when I first began my course work at the International Center for Studies in Creativity at Buffalo State College. Its importance was further justified as I went on a major creativity conference tour in 2000. It is now clear to me that the level of understanding of these methods needs to be heightened among practitioners in the field of creativity. It amazed me at these conferences how little people really understood the intricacies and differences among these methods. Mo Stein, one of the great pioneers in creativity, has eluded on many occasions that there is a need for the sharing of data on just how effective these, and other methods and training procedures are. He also believed that there is merit in comparing different programs so that we can learn which is more effective.

I sought out to bring clarity around these methods. I was after the truth. I felt this obligation to act as the “*creativity consciousness*” and call people on their silly behaviors and ‘us-against-them’ mindsets. I was disgusted by the reluctance of creativity practitioners to practice and live the simple principle of deferring judgment. It seemed to me that individuals were all too quick to negatively judge methods other than their own, and do so on blind faith. I realized that the exact principle that makes this field functional (deferral of judgment), is being discarded by those who help to comprise the field and make it what it is. It seemed to me that the field of creativity is not practicing what it preaches. There's a saying that I've lived by since a very young age and it goes, “*prescription before diagnosis is malpractice.*” It would behoove many individuals in the field of creativity to try this out.

FINAL THOUGHTS

Synectics

Synectics is powerful process and excels at generating novelty. I feel it will get you the quickest “aha”. The idea of detaching yourself from the problem is highly beneficial. Having spent many years in the advertising industry, I can confidently say that Synectics has made a natural problem solving process explicit. Idea generation in the world of advertising taps into the notion of making the strange familiar and the familiar strange on a daily basis – it is done so transparently though. It’s just now that I realize the strength behind consciously forcing opposites. Synectics is a natural process and as individuals we have a tendency to tinker and toy with analogues, be those personal, direct or forced. Synectics in fact has had a major influence on many of the tools found in the Creative Problem Solving Process and other creative problem solving processes.

It’s unfortunate that the future of Synectics is proprietary and exclusive and held under lock and key by the Synectics corporation. It’s unfortunate that Gordon and Prince had a falling out. Before their separation there seemed to be more interest in furthering the study of Synectics in academic circles and publicly sharing the learnings with the rest of the world. There seemed to be more collaboration of Synectics with others in the field of creativity “back in the day.” I trust that someday, Synectics will find its way back into academia where we may all benefit from its value in developing human potential.

Edward de Bono

Dr. de Bono has done wonders for the field of creativity from a philosophical viewpoint and showing the correlation between creativity and how the human mind operates. This understanding has been invaluable – he has clearly painted the rationale behind the case for disciplined and deliberate creativity. Edward de Bono has done a masterful job in the upfront sell-in to creativity...the why? His eloquent, philosophical approach to creativity brings much spirit and soul to the world of thinking. I don’t believe anyone has ever provided such a tantalizing proposition to move us from a selective to a generative thinking society. The field of creativity owes much to this man. His articulation and ‘packaging’ into the need for new thinking has had a massive impact on the category of creativity.

Edward de Bono has influenced individuals all over the world and has probably had the farthest and most expansive reach of any other practitioner in the field of creativity. There’s no doubt that his marketing savvy and ability to reach far and wide with his messages goes un-paralleled. Any marketer or advertiser will tell you that an inferior product will sell more quantity than a superior product when beautifully packaged. This happens everyday as we are lured in by convincing, mouth-watering propositions, only to buy into the proposition and realize we’ve been sold a bogus

product or one that doesn't live up to the claims it promised. An effective and smartly constructed campaign will close any deal if the consumer takes the proposition on blind faith and face validity.

This project has moved beyond the illusions of sexy propositions and gotten to the heart of matters. Dr. de Bono's work is powerful...no doubt about it. There is, however, a major gap between his powerful sell-in to provocation and changing concepts and perceptions, and the actual tools and techniques that allow us to generate and focus ideas. It feels like a free-fall of some sorts when you get in and begin to investigate the purpose of the Lateral Thinking techniques. I was hooked by the concept of Lateral Thinking, only to be let down by the sporadic and disorganized array of its thinking techniques. I feel Lateral Thinking relies too heavily on theory and philosophy and falls short in application. There is much duplication within his own Lateral Thinking techniques and then across to his Direct Attention Thinking Tools (DATTT). I'm skeptical of this duplication. Was the belief "more is better?" Was the intent to stack the deck in terms of providing an expansive portfolio of resources? Was this unconscious duplication or a marketing strategy? Only Dr. de Bono knows.

Six Hats, on the other hand, is an excellent thinking organizer and extremely beneficial and user-friendly. Six Hats has become a mainstay with so many individuals because of its ease and ability to effectively separate out thinking. Six Hats is both a tool and process and should have long shelf life.

As I reviewed de Bono's materials over the last fifteen months, I came to have a love-hate relationship with this creator. Love for his persuasive and fluent efforts to change the way we think and hate for the minimal and vague substance and solidity in his user-resources. Love for how much he has raised the awareness for the need for generative, new thinking and hate for egotistical nature. His work is showered with arrogance and is unattractive.

Ever since I devised the basic lateral thinking tools many years ago they have been plagiarized, borrowed, and altered, usually without permission or acknowledgement. Even the more prestigious institutions in the field are not above borrowing methods and material without acknowledging the source. (de Bono, 1992, p. 7)

A quick look to any of de Bono's work will tell you that he has never cited anyone other than himself, when truth be known, many pioneers in the field of creativity came before him and their concepts are sprinkled throughout all of his work. The seminal works in the field of creativity have always done an excellent job at citing the works of practitioners and researchers around the globe. This is called collaboration and moving the field of creative thinking forward...together. Are you telling me de Bono that you own the field of creativity and have never utilized the work of Wallas, Dewey, Rossman, Guilford, Gordon and Price, Osborn-Parnes, Torrance, Kepner-Tregoe, or the hundreds of the other marvelous and dedicated researchers to help you generate your own work? Pure rubbish! I can say, without any reservations whatsoever, that you give a new

meaning to the phrase ‘lone-wolf’ Dr. de Bono. I’m calling you on this de Bono because the exact accusations you make, happen to be a mirror-image reflection of that which you have consistently done to the many individuals in the field of creativity who deserve recognition. Who’s ripping who off?

Creative Problem Solving (CPS)

The key differentiating factor and benefit of CPS is its flexible, multilevel structure. Its operational model provides a non-linear framework for specific tools and techniques that generate, evaluate, develop, refine and implement novel solutions. Neither de Bono nor Syntectics can claim to have such a powerful thinking organizer in terms of making the natural human problem solving process explicit. CPS differentiates itself by describing the natural stages people go through when they take on a problem for which they don’t know the solution. I like the way CPS enhances one’s meta-cognitive skills, to the point where we always know what and where we happen to be thinking in route to solving a problem. The separation between creative and critical thinking (Dynamic Balance), is what makes CPS stand apart from Syntectics and de Bono’s work. Osborn’s original analogy of trying to think in both modes at the same time is like “driving with the brakes on” is so true. CPS is simple and solid. Its framework is virtually un-breakable and one must work very hard at trying to crash the divergent and convergent thinking tools. CPS neatly organizes our thinking. It is a holistic method and will act as a host to parts and tools of other methods better than any other structure in the field of creative thinking.

Although many will claim that CPS has changed considerably over the years, it really hasn’t. The original core of the Osborn-Parnes method holds strong today. What has changed is the language surrounding its components, stages and tools and the complete packaging of its shell. CPS has had such a long tradition of research and study and it seems that all of this research and constant toying with the method has complicated matters and taken away the user-friendly approach of earlier days. There is a balance between research and the actual packaging so that the user never has to feel that the process is too complicated or exclusive. In other words, at the application stage, no-one really cares about all the research and fancy jargon behind the method, they care about getting from A to Z in the quickest timeframe possible and with relative ease.

As I was on my conference tour in 2000 I became privy to the perception that CPS is too difficult to operate and learn. At the end of my degree I too concur with this perception. CPS has lost its soul and spirit and has become too mechanistic. It seems like CPS and its followers have been trying too hard to sell its proposition into the world. Really, this stuff isn’t Rocket science and I feel that the most recent versions of CPS and the books that communicate its ‘latest’ revisions and ‘new and improved’ self, have missed the mark. It would behoove CPS researchers and practitioners to review the packaging of old and strive to minimize the scientific language and mechanistic flow. CPS could benefit from the powerful philosophical approach and sell-in that de Bono takes. People are sometimes more easily lured in at higher levels of abstraction when the

communication of values, beliefs, soul and character shine through. At times I feel as if the authors of many books on CPS are writing to hear themselves speak and this is not doing CPS much justice at all. CPS is a wonderful and solid process...just keep it simple. Less is more.

COLLABORATION NATION

We must not base our ideology on blind faith. We must get behind the appearance of things...beyond the illusion and understand the matrix. We should always strive to understand what makes something stop and go. We must stop aggressively defending what we really may not understand. We need perspective. We must stop these cultish mindsets. Subscribing to certain families of thought and then throwing out the baby with the bathwater is poisonous and does the field of creativity no good. For if we are to grow as a field and someday make creativity a true and respected discipline, we should be better informed and let go of our own beliefs. Knowledge tends to hold us prisoner at times. Should we not better educate ourselves on the benefits of other methodologies and practices and learn to defer judgment?

In Scott Isaksen's opening charge to conference participants at the Fourth International Networking Conference on Creativity and Innovation, he declared,

We [will] know that we are successful when we know that there is evidence of cooperation in our study of creativity...It appears that those who have studied creativity have had to take on a persona of a lone scavenger wolf. Many of our pioneers have had to fight desperately for their academic integrity and their right to study creativity within a particular field...The image we call for in future inquiry is that creativity researchers should be invited guests rather than criminal trespassers. There should be more productive sharing of questions, methodologies, and results. Individual researchers will begin to communicate with each other raising the overall quality, consistency and relevance of their personal effort. This increased level of cooperation will not serve to stifle individual initiative but challenge the need to work in isolation. (Murdock, Isaksen, Vosburg, & Lugo, 1993, p. 138)

It is unfortunate that a field with so much to offer cannot get it together and collaborate. We set up camp, plant our methodological flags; never to mingle with our neighbors and discuss "how might we, together, bring more awareness and visibility for the need to adopt new ways of thinking?" Are matters of ethics the root cause of these fractionalized and 'lone-wolf' efforts? Mo Stein (1993) stated,

There is a great deal of money to be made these days in the creativity area – much more than in the golden days. When money enters the picture, one has to be super alert to ethics and interpersonal considerations. (p. 490)

Collaboration. This word seems not to exist in the field of creativity across practitioners who come from different methodological approaches. Do we not all have the same goals and vision...do we not want to change the world? For a field that promotes the benefits of new thinking and need for change, it sure has trouble swallowing its own pill. We have a long way to go if creativity is ever to become a respected and 'mainstream' discipline. Never has the field of creativity been so primed to influence the world and we just can't, for our own individual agendas seem to permit it, collaborate and give rise to the type of categorical initiative that will solidify the field of creativity and make it a discipline to be reckoned with.

It would behoove us as practitioners, academics or end users to generate some ideas how we might come together and finally make a massive mark on society. There is power in numbers and the field of creativity is home to some of the most prolific ideators in the world. Let us use this power together. We must work smarter, harder and more creatively at promoting the field of creativity and loosen the reigns behind our own individual agendas.

SUMMARY

I trust that as you read the foregoing evaluation, you will begin to frame in your mind how useful each of these methods is and more importantly I would hope that you give thought to what might be done to bring about more collaboration among individuals in the field of creativity. I hope that this project can be built upon en route to bringing more clarity around different methodologies. I'm sure I have invoked both pleasure and rage in the aforementioned thoughts. Provocation is critical in order to free closed fists, break up stagnation and evolve such a powerful and beneficial field responsible for human development.

REFERENCES

Advanced Practical Thinking. (2000). About Dr. de Bono. Retrieved October 16, 1999 from the World Wide Web:

<http://www.aptt.com>

Joyce, M., Isaksen, S., Davidson, F., Puccio, G.J., Coppage, C., & Maruska, M. (1997). An introduction to creativity (2nd ed.). Acton, MA: Copley Custom Publishing Group.

Creativity Web: Resources for Creativity and Innovation. Synectics. Retrieved February 8, 2001 from the World Wide Web:

<http://www.ozemail.com.au/~caveman/Creative/Techniques/synectics.htm>

Creativity Web: Resources for Creativity and Innovation. Trigger questions for synectics. Retrieved February 12, 2001 from the World Wide Web:

http://www.ozemail.com.au/~caveman/Creative/Techniques/syn_quest.htm

Creativity Web: Resources for Creativity and Innovation. Synectics questions. Retrieved February 12, 2001 from the World Wide Web:

<http://www.ozemail.com.au/~caveman/Creative/MacThink/synectics.htm>

de Bono, E. (1968). New think. The use of lateral thinking in the generation of new ideas. New York: Basic Books.

de Bono, E. (1970). Lateral thinking. London, England: Penguin Group.

de Bono, E. (1990). I am right you are wrong: From this to the new renaissance – from rock logic to water logic. London, England: Penguin Books.

de Bono, E. (1985). Six thinking hats. New York, NY: Little, Brown and Company.

de Bono, E. (1992). Teach you child how to think. London, England: Penguin Books.

- de Bono, E. (1969). The mechanism of the mind. New York: Simon & Schuster.
- de Bono, E. (1976). Thinking action: Teacher's handbook – CoRT VI. New York: Pergamon Press.
- de Bono, E. (1992). Serious creativity. New York, NY: Harper Business.
- Edward de Bono's Web. (2001). Reviewed entire contents of website. Retrieved January 5, 2001 from the World Wide Web:
<http://edwdebono.com>
- Firestien, R.L. (1996). Leading on the creative edge: Gaining competitive advantage through the power of creative problem solving. Colorado Springs, Colorado: Pi_on Press.
- Gitter, D.L., Gordon, W. J. J, & Prince, G.M. (1964). The operational mechanisms of synectics. Cambridge, MA: Synectics, Inc.
- Gordon, W. J. J. (1961). Synectics, the development of creative capacity. New York: Harper.
- Gordon, W. J. J. (1971). The new art of the possible: The basic course in synectics. Cambridge: Porpoise.
- Gordon, W.J.J., & Poze, T. (1968). The metaphorical way of learning and knowing: Applying synectics to sensitivity and learning situations. Cambridge, MA: Porpoise Books.
- Gordon, W.J.J., & Poze, T. (1972). Strange & familiar. Cambridge, MA: Porpoise Books.
- Gross, R. (1990). Teaching the world to think: The practical humanism of Edward de Bono. The Humanist, Vol. 50-51, 13-14, 38.

Isaksen, S.G., Dorval, K.B., & Treffinger, D.J. (1994). Creative approaches to problem solving. Debuque, Iowa: Kendall/Hunt.

Isaksen, S.G., Dorval, K.B., & Treffinger, D.J. (2000). Creative approaches to problem solving: A framework for change. Buffalo, NY: Creative Problem Solving Group-Buffalo.

Isaksen, S.G., Dorval, K.B., & Treffinger, D.J. (2000). Creative Problem Solving (CPS): A contemporary framework for managing change. Buffalo, NY: Center for Creative Learning and Creative Problem Solving Group-Buffalo.

Isaksen, S.G., & Treffinger, D.J. (1985). Creative Problem Solving: The basic course. Buffalo, NY: Bearly Limited.

Mance, M., (1996). An exploratory examination of methodology core contingencies within task appraisal. Unpublished master's project, Buffalo State College, Buffalo, NY.

McPherson, J.H. (1968). The people, the problems and the problem-solving methods. In Parnes, S.J. (1992). Source book for creative problem solving. Buffalo, NY: Creative Education Foundation Press.

Murdock, M., Isaksen, S.G., Vosburg, S. K., & Lugo, D. A. (1993). The progress and potential of an emerging discipline. In Isaksen, S. G., Murdock, M., Firestien, R. L., Treffinger, D. J. (1993). Understanding and recognizing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing Corporation.

Osborn, A.F. (1999). Applied Imagination (3rd ed.). Buffalo, NY: Creative Education Foundation Press.

Parnes, S.J. (1987). The creative studies project. In S.G. Isaksen (Ed.), Frontiers of creativity research: Beyond the basics (pp. 156-188). Buffalo, NY: Bearly Limited.

Parnes, S.J. (2000). Optimize the magic of your mind. Buffalo, NY: Bearly.

Pelletier, C. (2000). Problem-oriented policing: Building a bridge to creativity by exploring the potential use of CPS as an intervention to enhance effectiveness of the Sara model. Unpublished master's project, Buffalo State College, Buffalo, NY.

Prince, G. M. (1969). The practice of creativity. Cambridge, MA: Synectics, Inc.

Prince, G. M. (1967). The operational mechanism of synectics. Journal of Creative Behavior, 2. 1. 1-13.

Sternberg, R.J., & Lubart, T.I. (1999). The concept of creativity: Prospects and paradigms. In Sternberg, R.J., Handbook of Creativity. New York, NY: Cambridge University Press.

Stein, M. (1993). The olden days: Better, worse, does it matter? In Isaksen, S. G., Murdock, M., Firestien, R. L., Treffinger, D. J. (1993). Understanding and recognizing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing.

Synectics. (2001). Synectics' 9-step creative problem solving process. Retrieved February 8, 2001 from the World Wide Web:
<http://www.synecticsworld.com/helpdesk/problem-solving.htm>

Synectics. (2001). Stages of problem solving and idea development. Retrieved February 8, 2001 from the World Wide Web:
<http://www.synecticsworld.com/helpdesk/stages.htm>

Synectics. (2001). Fill me in on innovation. Retrieved February 8, 2001 from the World Wide Web:
<http://www.synecticsworld.com/helpdesk/fill-me-in.htm>

Tanner, D. (1997). Total creativity in business & industry: Road map to building a more innovative organization. Des Moines, IA: Advanced Practical Thinking Training, Inc.

Torrance, E.P., & Safter, T.H. (1999). Making the creative leap beyond... Buffalo, NY: Creative Education Foundation.

Torrance, E.P. (1972). Can we teach children how to think creatively. Journal of Creative Behavior, 6, 114-143.

Torrance, E.P., & Presbury, (1984). The criteria of success used in 242 recent experimental studies of creativity. The Creative Child and Adult Quarterly, 9, 238-243.

Treffinger, D. J., Isaksen, S. G., & Firestien, R. L. (1982). Handbook of creative learning. Vol.1. New York: Center for Creative Learning.

Vehar, J., Firestien, R.L., & Miller, B. (1996). CPS facilitation: A door to creative leadership. Williamsville, NY: Innovation Systems Group.

Vehar, J., Firestien, R.L., & Miller, B. (1996). Creativity unbound. Williamsville, NY: Innovation Systems Group.

Wright, C., (2000). How might we? An introduction to creative problem solving methods. Buffalo, NY: http://www.zideas.com/cps_methods.htm.

APPENDICES

Appendix A is the initial Concept Paper responsible for structuring the design and implementation of this project.

Theme Two:
Developing or Improving Our Understanding of CPS
Initiative:
Linking CPS to other areas or constructs
...comparing and contrasting CPS to other change methodologies

Project Title: An Evaluative Comparison Of The Similarities And Differences Between Creative Problem Solving (CPS), Synectics and Lateral Thinking.

Purpose and Questions: The purpose of this project is to compare and contrast three popular cognitive, creative problem solving models – Creative Problem Solving (CPS), Synectics and Lateral Thinking. Questions that will guide the study are:

- What are the key philosophical, theoretical, structural, functional and efficacy dimensions that comprise the CPS, Synectics and Lateral Thinking creative problem solving models?
- In what ways are these models similar and/or different based upon these comparative dimensions?
- How might an evaluative comparison of these models benefit practitioners?

Statement of Significance: The degree of collaboration, networking and conceptual understanding among professionals in the field of creativity has long been a concern (Murdock, Isaksen, Vosburg, & Lugo, 1993). Creativity is a field of study that has been plagued by fractionalized efforts and ‘us against them’ mindsets where many have ignored existing work in the field and opted rather to take on the ‘lone wolf’ image and work in isolation. In regard to creativity programs and models, Stein (1993) has noted that there is merit in comparing different creativity programs so that we can learn which is more effective (p. 489). There are numerous comparisons among various creative problem solving models (McPherson, 1968; Wright, 1999; Parnes, 2000), yet few have provided an evaluative comparison that goes beyond that of steps, phases and tools. This study will address the need for more thorough comparative data in regard to the Creative Problem Solving (CPS), Synectics and Lateral Thinking creative problem solving models. The Project will compare and contrast their similarities and differences among the following dimensions of analysis - philosophical, theoretical, structural, functional and efficacy. To date, no such heuristic framework has been created in order to critically and objectively review and compare these three models against focused criteria.

Description of the Method or Process: This project will use a qualitative/analytic approach to examine the content of the selected models. This study will be designed specifically to organize, define, analyze and synthesize information within each of the

five dimensions of analysis of this study - philosophical, theoretical, structural, functional and efficacy. I will develop specific criteria to evaluate each dimension based on the generation of who, what, where, when, why, and how questions. The criteria will then be used to identify specific aspects and examples within each dimension across all three models.

Process Flow:

1. Identify the three specific creative problem solving models and define the meaning behind 'creative problem solving model' in the context of this project;
2. Define each dimension of analysis to ensure clarity and differentiation;
3. Generate specific criteria for each dimension of analysis;
4. Gather data and document criteria findings;
5. Analyze and synthesize findings;
6. Communicate similarities and differences between each model by showing side-by-side comparisons on a per-dimension of analysis and per-criteria basis; and
7. Draw conclusions based on similarities and differences and provide final recommendations and next steps based on overall observations and findings of study.

Learning Goals: I would like to deepen my overall understanding of problem solving constructs in general and significantly add useful/high-impact content and process learnings to my problem-solving/facilitation knowledge and experience base. I want to develop expertise as a problem solver/facilitator and make my Master's Project the conduit for doing so, both from a content and process standpoint. Specifically, my goals are to:

- Broaden my philosophical, theoretical and practical content and process knowledge within the field of problem solving.
- Increase my ability to effectively intervene and solve problems by having numerous 'proven and credible' models at my disposal.
- Complement my CRS 680, 2001 class by experimenting with, translating and transitioning my Project content learnings into practical applications and maximize an opportunity to allow theory and practice to play off of and support/verify one another.
- Add to my existing network of creativity practitioners and scholars; and
- Develop/refine my analytical thinking skills so that I can effectively diagnose and differentiate between philosophical, theoretical, structural and functional dimensions/constructs, regardless of content or domain.

Outcomes:

- Project Write-Up
- Executive Summary for CSC Web Site
- 10 CBIR Annotations

Timeline:

- November 2000 - Concept Paper Approval/Methodology Outline
- November 2000 - Gather Data on Models
- December 2000 - Gather Data on Models
- January 2001 - Analysis Completed
- February 2001 - Write-Up
- March 2001 - Write Up
- April 2001 - Final Draft Approved
- May 2001 - Project Copied, Bound, Handed Over to BSC

Principal Investigators:

Investigator	-	David González
Major Advisor	-	Dr. Gerard Puccio
Instructor and Advisor	-	Dr. Mary Murdock

Related Literature:

de Bono, E. (1968). New think. The use of lateral thinking in the generation of new ideas. New York: Basic Books.

de Bono, E. (1970). Lateral thinking. London, England: Penguin Group.

de Bono, E. (1992). Serious creativity. New York, NY: Harper Business.

Gordon, W. J. J. (1961). Synectics, the development of creative capacity. New York: Harper.

Gordon, W. J. J. (1971). The basic course in synectics. Cambridge: Porpoise.

Isaksen, S. G., Dorval, K.B., & Treffinger, D.J. (1994). Creative approaches to problem solving. Debuque, Iowa: Kendall/Hunt.

Isaksen, S. G. - Dissertation (Families Approach)

Mance, M., (1996). An exploratory examination of methodology core contingencies within task appraisal. Unpublished master's project, Buffalo State College, Buffalo, NY.

McPherson, J.H. (1968). The people, the problems and the problem-solving methods. In Parnes, S.J. (1992). Source Book for Creative Problem Solving. Buffalo, NY: Creative Education Foundation Press.

Murdock, M., Isaksen, S.G., Vosburg, S. K., & Lugo, D. A. (1993). The progress and potential of an emerging discipline. In Isaksen, S. G., Murdock, M., Firestien, R. L., Treffinger, D. J. (1993). Understanding and recognizing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing Corporation.

Parnes, S.J. (2000). Optimize the magic of your mind. Buffalo, NY: Bearly.

Prince, G. M. (1969). The practice of creativity. Cambridge, MA: Synectics.

Prince, G. M. (1967). The operational mechanism of synectics. Journal of Creative Behavior. 2. 1. 1-13.

Treffinger, D. J., Isaksen, S. G., Firestien, R. L. (1982). Handbook of creative learning. Vol.1. New York: Center for Creative Learning.

Stein, M. (1993). The olden days: Better, worse, does it matter? In Isaksen, S. G., Murdock, M., Firestien, R. L., Treffinger, D. J. (1993). Understanding and recognizing creativity: The emergence of a discipline. Norwood, New Jersey: Ablex Publishing.

Wright, C., (2000). How might we? An introduction to creative problem solving methods. Buffalo, NY: http://www.zideas.com/cps_methods.htm