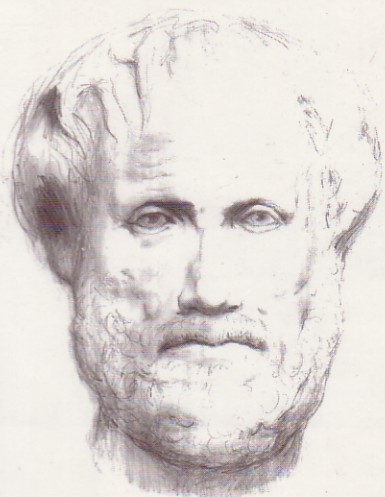
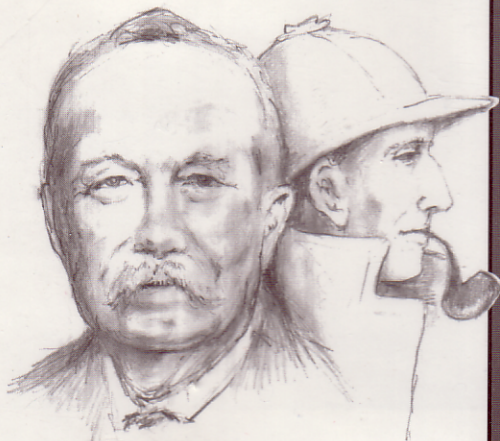


Strategies of Genius



Aristotle



Sir Arthur Conan Doyle's
Sherlock Holmes



Walt Disney



Wolfgang Amadeus Mozart

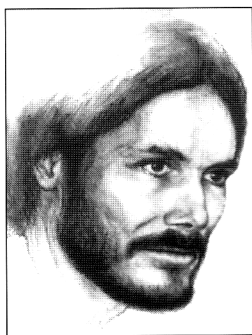
Robert B. Dilts

Author's Biography

Robert Dilts has been an author, developer, consultant and trainer in the field of *Neuro-Linguistic Programming* (NLP) since its creation in 1975. His personal contributions to the field of NLP include much of the seminal work on the NLP technologies relating to cognitive strategies and belief change. Some of his techniques and models include: Reimprinting, Integration of Conflicting Beliefs, 'Sleight of Mouth' patterns and 'Neuro-Logical' levels.

Dilts is the principal author of *Neuro-Linguistic Programming Vol. 1*, and has authored numerous other books on NLP including *Changing Beliefs with NLP*, and *Beliefs: Pathways to Health and Well Being* which describe his work in transforming limiting beliefs and creating functional belief systems. His books *Tools for Dreamers* and *Skills for the Future*, explore the applications of NLP to the management and enhancement of creativity. His recent work *Effective Presentation Skills* describes applications of NLP to public speaking and teaching.

Dilts views his work on the *Strategies of Genius* as part of the larger mission to utilize NLP to extend the horizon of human capabilities and achievement.



Robert B. Dilts

About
Strategies of Genius: Volume I

It has been said that human history is nothing more than a record of the deeds and ideas of great men and women. Ever since people began to turn their attention inward to examine their own thought processes, one of the hopes and promises of psychological inquiry has been to map out the key features of the mind that will allow our own thoughts to soar with the giants of history.

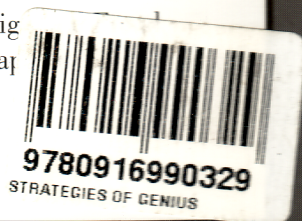
Neuro-Linguistic Programming (NLP) provides a new set of tools that can allow us to take major steps toward this promising but elusive goal. The mission of NLP is to define and extend the leading edge of human knowledge—particularly our knowledge about ourselves—by ‘modeling’ the thought processes or ‘strategies’ of effective people.

The purpose of this series on *Strategies of Genius* is to apply the tools of NLP to analyze important historical figures in order to produce practical and effective “strategies of genius” that can be learned and applied in other contexts.

This first volume analyzes the thinking processes of Aristotle, Sherlock Holmes, Walt Disney and Wolfgang Amadeus Mozart. The behavioral areas in which all of these individuals operated were quite different from one another, and one of them is actually a character from fiction. However, they all have something in common: unique and powerful strategies for analyzing, problem solving or creating, which continue to fascinate and entertain us to this day.

By analyzing quotations and anecdotes, the author paints a rich picture of the thinking processes of each of these unique individuals and then shows how those thinking processes may be used by the reader to enhance his or her own creativity and problem solving ability.

Future volumes include studies of Albert Einstein, Sig Leonardo da Vinci and others who have helped to shape modern world.



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Dedication

To my coauthors of
Neuro-Linguistic Programming Volume I
- John Grinder, Richard Bandler,
Judith DeLozier and Leslie Lebeau -
who participated in the birth of this vision and mission,
and to David Gordon, Todd Epstein, Gino Bonissone
and the many others who have shared the vision
with me since then.

Acknowledgments

I would like to acknowledge:

My parents Patricia and Robert who transferred to me their joy and interest in science, literature, art, music and the preciousness of life.

My brothers Mike, Dan and John and my sister Mary who shared with me the fascination and excitement of exploring this incredible and beautiful planet.

My wife Anita, and my children Andrew and Julia whose understanding and patience with me has been almost super-human. There is no way I could have completed such a work without their support.

Todd and Teresa Epstein who have backed my creative efforts over the years, and published early versions of some of these strategies through Dynamic Learning Publications.

Michael Pollard and Ami Sattinger who labored with me as Realist and Critic to put these ideas into book form.

And all of the people over the years who have sent me material and supported me and encouraged me in my mission.

Preface

In the preface to *Neuro-Linguistic Programming Volume I* my coauthors and I attempted to define the scope and purpose of the field that we had participated in creating together. We pointed out that:

"NLP could be described as an extension of linguistics, neurology, or psychology; separations that although may in fact be fictitious in nature are in fact expedient for human learning and the development of knowledge that is practical and impactful on our lives...[NLP is] not just useful models and patterns formalized from various activities, but an extension of how those patterns and models came into being, thus a field both informative and practical, but most significant...unique in its purpose and methodology."

We sought to identify a broad and challenging future for the field as a cognitive science, and expressed our belief that, through NLP, *"...learning and experiences from entirely divergent fields have the opportunity to combine knowledge and experience into configurations that allow further growth, understanding and impact upon ourselves as a species."*

In the book, we defined a system of distinctions and a methodology for studying the "structure of subjective experience." We identified a set of tools that could be used to discover and describe the mental programming of an individual in the form of cognitive "strategies." The book covered principles of *elicitation, utilization, design and installation* of such strategies. As illustrations of these principles, we suggested some ways in which this new technology of the mind could be applied to the areas of health, learning, business management and psychotherapy.

In the conclusion to *Neuro-Linguistic Programming Volume I*, we promised:

*"...the next book in the series, **Neuro-Linguistic Programming Volume II**, in which we will apply the model that has been developed here to present and analyze the strategies that we have found to be the most effective and well-formed for achieving the outcomes for which they were created. In Volume II we will present the strategies that have proven to be the most efficient and elegant for achieving successful results in areas and disciplines, ranging from learning physics, to playing chess, to making decisions, to learning to play a musical instrument, to creating entirely new models of the world for yourself. In the second volume we will also explore more specifically how to apply Neuro-Linguistic Programming to your work and everyday life."*

For a number of reasons we were unable to follow through with this commitment. But that pledge and the vision behind it has stayed with me these many years since *NLP Volume I* was first conceived and written. In many ways, this series on the *Strategies of Genius* is intended to be the fulfillment of that promise of an *NLP Volume II*.

On another level, this work is the fulfillment of a vision that began almost twenty years ago, a full five years before the publishing of *NLP Volume I*. In a class at the University of California at Santa Cruz, called *Pragmatics of Human Communication*, I had a conversation with John Grinder about the possibility of mapping the sequences in which exceptional people unconsciously employed their senses while they were thinking. I was at that time a junior in college and John Grinder was a professor of linguistics.

The discussion planted a seed in me about a larger study of the cognitive patterns of well known geniuses, that would

on the one hand honor their brilliance, and at the same time demystify it and make it have more practical applications. Part of the idea was that these strategies could be coded into basic yet simple enough elements that aspects of them could even be taught to children in preparation for challenges they would face in their adult lives.

That seed was to grow into this work on the *Strategies of Genius*.

This book is the first volume of *Strategies of Genius*. In it I will explore the cognitive processes of four very different but important individuals who have contributed in a positive way to our modern world; Aristotle, Sherlock Holmes, Walt Disney and Wolfgang Amadeus Mozart. The behavioral areas in which all of these individuals operated were quite different from one another, and one of them is actually a character from fiction. However they all have something in common: unique and powerful strategies for analyzing and problem solving or creating, which continue to fascinate and entertain us to this day.

Volume II of this work is entirely devoted to Albert Einstein. The mere scope and magnitude of Einstein's contributions to our perceptions of ourselves and our universe warrants an entire volume.

Future volumes will include studies of Leonardo da Vinci, Sigmund Freud, John Stewart Mill, Nicola Tesla and some more recent 'geniuses' such as Gregory Bateson, Moshe Feldenkrais and Milton H. Erickson, M.D.

The choice of the individuals studied in this work did not come out of any deliberate plan. Rather they were people who had sparked or inspired something in me personally or seemed to represent something deeply fundamental. Often, key material used for analysis was serendipitously given to me by someone who knew I was interested in a certain individual or was researching the strategies of geniuses. The project unfolded organically in a way similar to the processes used by these geniuses themselves.

While the chapters on the various geniuses in this book make references to one another, it is not necessary to read them consecutively, and readers may want to skip around a bit. Obviously the different geniuses studied in each chapter operated in different fields and had different approaches that may be of more or less interest to the reader. Aristotle, for instance, was a philosopher, so his ideas are necessarily more philosophical than pragmatic in nature. If you find some of his ideas too challenging or not as relevant, you may want to skip to one of the other chapters first and then return to Aristotle later on. The same approach can be applied to any of the chapters.

I mentioned earlier that this study has been germinating in me for almost twenty years. Over those years, my understanding of the strategies of genius has matured as I have. My hope is that, through this work, I can convey some of the immense possibilities and scope of the rich tapestry of the human mind and “subjective experience.” I hope that you enjoy the journey.

“I want to know how God created this world. I am not interested in this or that phenomenon, in the spectrum of this or that element; I want to know his thoughts; the rest are details.”

- Albert Einstein

“In the beginning God created the Heaven and the Earth. And the Earth was without form and void; and darkness was upon the face of the deep. And the spirit of God moved upon the face of the waters. And God said, Let there be light: and there was light. And God saw the light, that it was good: and God divided the light from the darkness. And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day.

“And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so. And God called the firmament Heaven. And the evening and morning were the second day.

“And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so. And God called the dry land Earth; and the waters called he the Seas: and God saw that it was good...And the earth brought forth grass, and herbs yielding seed after his kind, and the tree yielding fruit, whose seed was in itself after his kind: and God saw that it was good. And the evening and the morning were the third day.

“And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs and seasons, and for days and years: And let them be for lights in the firmament of the heaven to give light upon the earth: and it was so. And God made two great lights: the greater light to rule the day, and the lesser light to rule the night: he made the stars also...and God saw that it was good. And the evening and the morning were the fourth day.

“And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good. And God blessed them saying, Be fruitful and multiply, and fill the waters and the seas, and let the fowl multiply in the earth. And the morning and the evening were the fifth day.

“And God said, Let the earth bring forth the living creature after his kind, cattle and creeping thing, and beast of the earth after his kind: and it was so...And God saw that it was good. And God said, Let us make man in our image, after our likeness...So God created man in his own image, in the image of God created he him; male and female created he them. And God blessed them and God said unto them, Be fruitful and multiply, and replenish the earth and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth over the earth. And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in which is the fruit of a tree yielding seed; to you it shall be for meat. And to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth wherein there is life, I have given every green herb for meat: and it was so. And God saw everything that he had made, and, behold, it was very good. And the evening and the morning were the sixth day.

“Thus the heavens and the earth were finished, and all the host of them. And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made.”

- Genesis 1:1 - 2:3

INTRODUCTION

The powerful and moving words of Genesis tell a story of creation on a number of levels. In addition to describing what was created, they describe a process for *how* it was created. They give us a description of ‘God’s thoughts’ in the form of a strategy for creation that has a specific structure. It is a strategy involving a set of steps which unfold over time in a kind of a feedback loop. Creation begins through the act of making a distinction - creating a difference. This first act leads to another, and then another, and then another - each idea leading to the potential for the next. Each act of creation involves the reiteration of a cycle involving three fundamental processes:

1. Conceptualization - *“And God said, Let there be...”*
2. Implementation - *“And God made...”*
3. Evaluation - *“And God saw that it was good.”*

Each cycle leads to a successively more refined and personal expression of ideas. With each cycle the idea takes on more and more of a life of its own - the idea itself is able to ‘bring forth’, ‘multiply’ and sustain other ideas. The ultimate expression reflects the process of the creator so much that it is able to ‘replenish’ all of the other creations as well as multiply itself.

In a way, this series on the ‘strategies of genius’ tells the same story. It is a study of the process behind the creation of ideas that have influenced our world in some way. The focus of these volumes is not on the ideas themselves, but rather on the strategies that led to the ideas and their concrete expressions.

Einstein's comment that he strove to know 'God's thoughts' epitomizes the essence of genius and the vision behind this work. The content of an act of creation or genius is not the goal. The goal is what more we can learn about the 'mind of God' through the process.

One of my own personal symbols for what genius is about is represented by Michelangelo's painting on the ceiling of the Sistine Chapel in Rome. The painting shows Adam lying on the Earth reaching up toward heaven and the hand of God stretching down from the sky. Their fingers are outstretched toward one another, just ready to touch. To me, the miracle is in that spark in between the two fingers. That is what genius is all about. This is what I seek to explore in this book - that interaction between the sacred and the profane; between the map and the territory; between vision and action.



Neuro-Linguistic Programming

"Human history is in essence a history of ideas."

H. G. Wells - **The Outline of History**

It has been said that human history is nothing more than a record of the deeds and ideas of great men and women. Since the dawn of recorded history it has been the goal of historians, philosophers, psychologists, sociologists and the other chroniclers of our species to identify and record the critical elements that generated those deeds and ideas.

A fundamental goal of psychology, in particular, has been to attempt to define those key elements which have contributed most to the evolution of ideas. Ever since we humans first began to turn our attention inward to examine our own thought processes, one of the hopes and promises of psychological inquiry has been to map out those critical features of 'mind' that will allow our own thoughts to soar with the giants of history.

Neuro-Linguistic Programming (NLP) provides a new set of tools that can allow us to take major steps toward this promising but elusive goal. The mission of NLP has been to define and extend the leading edge of human knowledge - and in particular the leading edge of human knowledge about humans. This work, the study of strategies of genius, is a part of that mission. My goal has been to model the strategies of people who have not only contributed to our knowledge of the world around us, but also to our knowledge about ourselves, and to discover how to use those strategies to further contribute to the evolution of human beings.

NLP is a pragmatic school of thought - an '*epistemology*' - that addresses the many levels involved in being human. NLP is a multi-dimensional process that involves the development of behavioral competence and flexibility, but also involves strategic thinking and an understanding of the

mental and cognitive processes behind behavior. NLP provides tools and skills for the development of states of individual excellence, but it also establishes a system of empowering beliefs and presuppositions about what human beings are, what communication is and what the process of change is all about. At another level, NLP is about self-discovery, exploring identity and mission. It also provides a framework for understanding and relating to the 'spiritual' part of human experience that reaches beyond us as individuals. NLP is not only about competence and excellence, it is about wisdom and vision. All of these elements are required for genius.

The three most influential components involved in producing human experience are neurology, language and programming. The neurological system regulates how our bodies function, language determines how we interface and communicate with other people and our programming determines the kinds of models of the world we create. Neuro-Linguistic Programming describes the fundamental dynamics between mind (neuro) and language (linguistic) and how their interplay effects our body and behavior (programming).

One of the great contributions of NLP is that it gives us a way to look past the behavioral content of what people do to the more invisible forces behind those behaviors; to the structures of thought that allowed these geniuses to accomplish what they accomplished. NLP provides a structure and a language to be able to put into a set of chunks or steps the relevant mental processes used by a Leonardo or an Einstein so that those mental processes can be taught to others.

The other tremendous contribution of NLP is that by looking at the underlying structure of behavior it allows us to transcend the content to the degree that we can apply the thinking process of genius in one field to another whole area of content. We can discover elements of how Einstein thought about physics, his *strategy* for thinking about physics, and apply it to thinking about society or to thinking about a

personal problem. Likewise, we can extract key elements of Mozart's strategy for writing music and shift from the content of music to solving an organizational problem or teaching children how to read.

The belief system of NLP is that it is the thinking process behind the accomplishment that is the most important element of creating something like genius. And the same thing that makes an effective strategy for cooking can be applied to a strategy for making movies or a strategy for writing books.

As my colleagues and I stated in **Neuro-Linguistic Programming Vol. I:**

By identifying [mental] sequences that lead to specific outcomes we can, in essence, replicate (or "clone") any behavior - whether that of a businessperson, scientist, healer, athlete, musician or anyone that does something well. With the tools provided by NLP, we believe anyone can be transformed into a modern "renaissance" person.

In essence, all of NLP is founded on two fundamental premises:

1. *The Map is Not the Territory.* As human beings, we can never know reality. We can only know our perceptions of reality. We experience and respond to the world around us primarily through our sensory representational systems. It is our 'neuro-linguistic' maps of reality that determine how we behave and that give those behaviors meaning, not reality itself. It is generally not reality that limits us or empowers us, but rather our map of reality.

2. *Life and 'Mind' are Systemic Processes.* The processes that take place within a human being and between human beings and their environment are systemic. Our bodies, our societies, and our universe form an ecology of complex systems and sub-systems all of which interact with and mutually influence each other. It is not possible to completely

isolate any part of the system from the rest of the system. Such systems are based on certain 'self-organizing' principles and naturally seek optimal states of balance or homeostasis.

All of the models and techniques of NLP are based on the combination of these two principles. In the belief system of NLP it is not possible for human beings to know objective reality. Wisdom, ethics and ecology do not derive from having the one 'right' or 'correct' map of the world, because human beings would not be capable of making one. Rather, the goal is to create the richest map possible that respects the systemic nature and ecology of ourselves and the world in which we live.

Individual Models of the World

The domain of what NLP addresses is best described as "subjective experience." Subjective experience encompasses what has been variously called "thought," "mind," or "intelligence," and in its broadest sense refers to the totality of the activity in our nervous systems. It is through our own personal subjective experience that we know the world around us. In their first book, **The Structure of Magic Vol. I**, Richard Bandler and John Grinder (the co-creators of NLP) pointed out:

A number of people in the history of civilization have made this point - that there is an irreducible difference between the world and our experience of it. We as human beings do not operate directly on the world. Each of us creates a representation of the world in which we live - that is, we create a map or model which we use to determine our behavior. Our representation of the world determines to a large degree what our experience of the world will be, how we will perceive the world, what choices we will see available to us as we live in that world... No two

human beings have exactly the same experiences. The model that we create to guide us in the world is based in part upon our experiences. Each of us may, then, create a different model of the world we share and thus come to live in a somewhat different reality.

Thus, it is our mental model of reality, rather than reality itself that will determine how we will act. Until someone mentally created a map of the "atom" or the "virus" or a "round world" those aspects of "reality" could not affect the actions of our ancestors or ourselves.

Bandler and Grinder go on to point out that the difference between people who respond effectively as opposed to those who respond poorly in the world around them is largely a function of their internal model of the world.

[P]eople who respond creatively and cope effectively...are people who have a rich representation or model of their situation, in which they perceive a wide range of options in choosing their action. The other people experience themselves as having few options, none of which are attractive to them...What we have found is not that the world is too limited or that there are no choices, but that these people block themselves from seeing those options and possibilities that are open to them since they are not available in their models of the world.

As I pointed out earlier, NLP starts from the presupposition that "the map is not the territory." Everyone has their own unique map or model of the world, and no one map is any more "true" or "real" than any other. Rather, the people who are most effective are the ones who have a map of the world that allows them to perceive the greatest number of available choices and perspectives. A person who is a "ge-

nius," then, simply has a richer and wider way of perceiving, organizing and responding to the world. NLP provides a set of processes for enriching the choices that you have and perceive as available in the world around you.

It is the goal of this book to use NLP to find, in the words of anthropologist Gregory Bateson, "the difference that makes the difference." We want to make a model of the models of the world of a number of great people throughout history. Used in this way, we can say that NLP is a "meta model." That is, a model ABOUT models.

Modeling

"There is properly no history, only biography."

Emerson - **Essays**

Modeling is the process of taking a complex event or series of events and breaking it into small enough chunks that it can be repeated in a manageable way. The field of Neuro-Linguistic Programming has developed out of the modeling of human thinking skills. The NLP modeling process involves finding out about how the brain ("Neuro") is operating by analyzing language patterns ("Linguistic") and non-verbal communication. The results of this analysis are then put into step-by-step strategies or programs ("Programming") that may be used transfer the skill to other people and content areas.

In fact, NLP began when Richard Bandler and John Grinder modeled patterns of language and behavior in the works of Fritz Perls (the founder of Gestalt therapy), Virginia Satir (a founder of family therapy and systemic therapy) and Milton H. Erickson, M.D. (founder of the American Society of Clinical Hypnosis). The first 'techniques' of NLP were derived from key verbal and non-verbal patterns Grinder and Bandler observed in the behavior of these exceptional therapists. The implication of the title of their first book, *The Structure of Magic*, was that what seemed magical and unexplainable often had a deeper structure that, when illuminated, could be understood, communicated and put into practice by people other than the few exceptional 'wizards' who had initially performed the 'magic'. NLP is the process by which the relevant pieces of these people's behavior was discovered and then organized together into a working model.

NLP has developed techniques and distinctions with which to identify and describe patterns of people's verbal and non-verbal behavior - that is, key aspects of what people say and what they do. The basic objectives of NLP are to model

special or exceptional abilities and help make them transferable to others. The purpose of this kind of modeling is to put what has been observed and described into action in a way that is productive and enriching.

The modeling tools of NLP allow us to identify specific, reproducible patterns in the language and behavior of effective role models. While most NLP analysis is done by actually watching and listening to the role model in action, much valuable information can be gleaned from written records as well.

In this book I will attempt to model the thinking processes of a number of historical individuals, who have been identified as geniuses of one kind or another, by analyzing their language patterns as they have been passed down to us through their writings. I will also examine the products of their genius when appropriate for what they might tell us about the creative process that produced them. The synthesis of this information will be put into "programs" or strategies that we may, hopefully, use to enhance our own processes of creativity and intelligence.

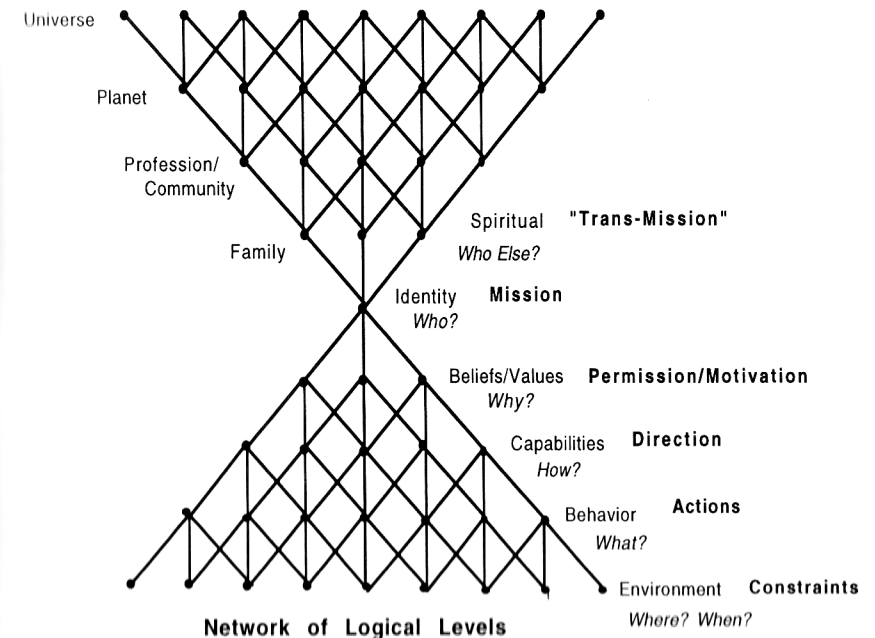
Levels of Modeling

In modeling an individual there are a number of different aspects, or levels, of the various systems and sub-systems in which that person operated that we may explore. We can look at the historical and geographical *environment* in which the individual lived - i.e., *when* and *where* the person operated. We can examine the individual's specific *behaviors* and actions - i.e., *what* the person did in that environment. We may also look at the intellectual and cognitive strategies and *capabilities* by which the individual selected and guided his or her actions in the environment - i.e., *how* the person generated these behaviors in that context. We could further explore the beliefs and values that motivated and shaped the thinking strategies and capabilities that the individual developed to accomplish his or her behavioral goals in the

environment - i.e., *why* the person did things the way he or she did them in those times and places. We could look more deeply to investigate the individual's perception of the self or identity he or she was manifesting through that set of beliefs, capabilities and actions in that environment - i.e., the *who* behind the why, how, what, where and when.

We might also want to examine the way in which that identity manifested itself in relationship to the individual's family, colleagues, contemporaries, Western Society and Culture, the planet, God - i.e., who the person was in relation to *who else*. In other words, how did the behaviors, abilities, beliefs, values and identity of the individual influence and interact with larger systems of which he or she was a part in a personal, social and ultimately *spiritual* way?

One way to visualize the relationships between these elements is as a network of generative systems that focus or converge on the identity of the individual as the core of the modeling process.



In summary, modeling the process of genius may involve exploring the interactions of a number of different levels of experience, including:

Spiritual	Vision & Purpose
A. <i>Who I Am</i> - Identity	Mission
B. <i>My Belief System</i> -	Values, Meta Programs Permission & Motivation
C. <i>My Capabilities</i> -	States, Strategies Direction
D. <i>What I Do</i> -	Specific Behaviors Actions
E. <i>My Environment</i> -	External Context Reactions

- Environment determines the external opportunities or constraints a person has to react to. Relates to the *where* and *when* of genius.
- Behaviors are the specific actions or reactions made by a person within the environment. Relates to the *what* of genius.
- Capabilities guide and give direction to behavioral actions through a mental map, plan or strategy. Relates to the *how* of genius.
- Beliefs and values provide the reinforcement (motivation and permission) that supports or inhibits capabilities. Relates to the *why* of genius.
- Identity involves a person's role, mission and/or sense of self. Relates to the *who* of genius.
- Spiritual involves the larger system of which one is a part and the influence of that system on healing. Relates to the *who else and what else* of genius.

Therefore, as part of the modeling process, we can identify several different levels of strategy.

Strategies

A strategy is a particular area of modeling in which you are specifically looking for a mental map that was used by the individual whom you are modeling in order to orchestrate or organize his or her activities to accomplish an effective result.

Neuro-Linguistic Programming provides a set of tools and distinctions that allow us to map out cognitive processes underlying the works of creative and exceptional people. Rather than focus on the content of the work of the particular individual to be modeled, NLP looks for the deeper structures that produced those results. In particular, NLP searches for the way in which someone uses such basic *neurological* processes as the senses (i.e., *seeing, hearing, feeling, smelling and tasting*), how these processes are shaped and reflected by *language*, and how the two combine to produce a particular *program* or strategy. According to the NLP model it is the way in which we organize our sensory and linguistic functions into a programmed sequence of mental activity that determines to a large degree how we will perceive and respond to the world around us.

Historically, Neuro-Linguistic Programming was brought into existence in California at the same time another important technological and social revolution was being born - the personal computer. As has been true in other periods in history, developments in our understanding of the mind mirror developments in technology (and vice versa). Much of the NLP approach to the mind is based on viewing the brain as functioning similar to a computer in some ways. In fact, much of the NLP terminology (and the name itself) incorporates the language of computer science.

A strategy is like a program in a computer. It tells you what to do with the information you are getting, and like a computer program, you can use the same strategy to process

a lot of different kinds of information. A computer program might tell the computer, "take this piece of data and take that piece of data, to add them together and put the answer in a particular place in memory." The program is independent of the content being processed through it. It doesn't care what content is being put together and moved. Some programs are more efficient than others; some allow you to do more with the information than others; some are designed to take a lot of information and reduce it to very tightly chunked information. Other computer programs are designed to take some information and make projections with it. Some programs are designed to find patterns and features within information.

The same thing is going to be true of human strategies. As an analogy, they are the mental software used by the bio-computer of the brain. In a way, the most powerful personal computer in the world is the one that sits up between your ears. The problem with it is that it didn't come with a user's manual, and sometimes the software isn't very "user friendly." The goal of psychology, and in particular NLP, is to discover the "programming language" of the human nervous system so we can get ours and others' to do what we want them to do more elegantly, effectively and ecologically. We can be 'software wizards' and encode in a new language some of the software used by people who have learned to operate that computer very well.

Micro, Macro and Meta Strategies

Strategies occur at different levels - there are micro-strategies, macro-strategies and meta-strategies.

- A micro-strategy focuses on how exactly a particular person is thinking within a specific moment in order to accomplish a particular task. If somebody is engaging in a process of remembering a particular piece of information, lets say a telephone number, what do they do with that informa-

tion in order to store it and recover it from within their brain or bio-computer? On this micro-level you might want to know exactly what size that person is visualizing the telephone number in his or her mind. Is there a particular color in which that person pictures the number? Does the person verbally repeat the number internally? Does the person have a feeling somewhere in his or her body? This would be a micro-strategy. It would be like assembly language or machine code in a computer.

- A macro-strategy would be more like modeling "success" or "leadership." An overall strategy for success or leadership is not going to be a micro-strategy but rather a higher level program that will incorporate many micro strategies. It might be something that takes place over a much longer period of time. Sometimes it is the more general steps of a process that are important for reaching a particular result, and how specifically you get from A to B to C on a micro-level is not important or may require significant variation. What is important is that you get from A to C regardless of the micro steps. The way you personally get there is up to you. So a macro-strategy would have to do with the more general operations and steps of a thinking process.

- A meta-strategy or a meta-model is basically a model for making models; a strategy for finding strategies, or a model for modeling. In a sense, a major part of what you are going to be learning in this book is a meta-model and a set of meta-strategies - strategies and models for finding the strategies of exceptional individuals and making practical models out of those strategies.

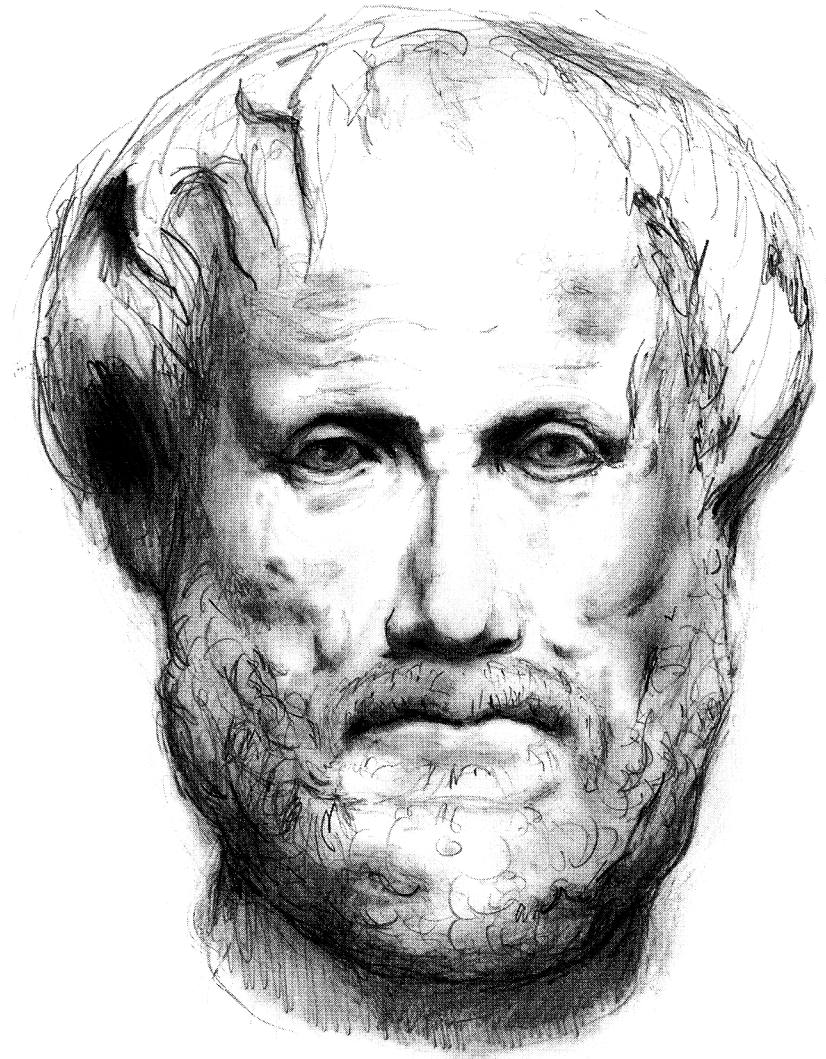
Modeling Strategies of Genius

In summary, the purpose of modeling is not to make the one 'real' map or model of something, but rather to enrich our perceptions in a way that allows us to be both more effective and more ecological in how we interact with reality. A model is not intended to be reality, but instead to represent certain aspects of that reality in a practical and concrete way.

The goal of this book is to show how the tools of NLP can be used to analyze important historical figures to produce practical and effective "strategies of genius" that can be learned and applied in other contexts. My particular interest - in relation to my own mission - is to apply these genius' strategies to human issues. In other words, to explore how can we apply these strategies so that we can become more intelligent about our own human processes. As my colleagues and I said in ***NLP Volume I***:

"Understood and used with the elegance and pragmatism with which NLP was created we may not only discover how Freud made Einstein's theories possible, but a way to influence and predict the very elements that would make human beings capable of being humane, by subjectively valuing what creations, creating can offer."

Perhaps if we could take Mozart's ability to structure notes into music, Einstein's ability to restructure our perceptions of the universe or Leonardo's ability to form his imagination into a drawing or painting and apply them to restructure the way people interact in social organizations, we might be able to really advance the course of human history. That is my dream; my vision for this work.



Aristotle

Chapter 1

Aristotle

Creating A Framework For Genius

Overview of Chapter 1

- **Building Blocks of Genius**
 - Getting to 'First Principles'
 - Asking Basic Questions
 - The Strategy for Finding the 'Middle'
 - 'Syllogisms' as Expressions of 'First Principles'
- The S.O.A.R. Model**
- Basic Types of Causes**
 - Formal Causes
 - Antecedent Causes
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- The Role of Time Perception**
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- **Aristotle's Model of the Mind**
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Overview of Chapter 1 (continued)

Macro Strategies and the T.O.T.E.

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The Role of Memory and Imagination

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- **Modeling Micro Strategies - The R.O.L.E. Model**
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- **Summary**
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ARISTOTLE

The Building Blocks of Genius

The first genius whose strategy I would like to model for this study is the Greek philosopher Aristotle (385-322 BC). Considered to be the 'father of modern science', Aristotle is undoubtedly one of the most influential geniuses of Western civilization. His scope of thought covered an incredible variety of subjects including physics, logic, ethics, politics, rhetoric, biology, poetics, metaphysics and psychology. In most cases, Aristotle's discoveries and contributions were so fundamental that they stood as the definitive works in each of these fields for centuries.

Clearly, there was something very special about Aristotle's strategy for organizing his observations of the world around him that allowed him to accomplish such a tremendous intellectual feat. Aristotle's mental processes allowed him to creatively explore and usefully organize information from many diverse areas of life (Plato referred to him as "the mind"). It was the rediscovery of Aristotle's way of thinking that is credited with bringing Western civilization out of the dark ages into the renaissance.

From the NLP point of view, Aristotle had his own very effective strategy for modeling. He was in fact a 'modeler'. He looked into the most essential areas of human experience and made very powerful models of them. He wasn't a 'specialist' in any area; and yet he was able to reach a deep level of knowledge about the different aspects of the world he examined.

What is of greatest interest to us, as 'meta' modelers of Aristotle, is the way in which he thought about his experiences. By applying the modeling procedures of NLP to Aristotle's writings, we can map out some of the specific elements of Aristotle's strategy in a way that may contribute

some new and practical insight into his impressive genius and how we can apply it to our lives today.

It is interesting that one of the topics that Aristotle never did specifically address was the topic we are attempting to cover in this book - 'genius'. It is an intriguing question to wonder how Aristotle would have approached understanding this phenomenon. Obviously, Aristotle is no longer around to provide an answer, but he has left many clues and cues in his writings about the type of strategy he would have employed. It seems only fitting to begin our inquiry into the strategies of genius, and their application, by 'unpacking' Aristotle's strategy for inquiry and analysis and applying it to our exploration.

Getting to 'First Principles'

Perhaps the most important part of Aristotle's genius was his ability to discover basic and fundamental patterns or 'laws' in whatever field of experience he chose to explore. As he explains in his book *Physics*:

"When the objects of an inquiry in any department, have principles, conditions, or elements, it is through acquaintance with these that knowledge, that is to say scientific knowledge, is attained. For we do not think that we know a thing until we are acquainted with its primary conditions or first principles, and have carried our analysis as far as its simplest elements..."

"Now what is to us plain and obvious at first is rather confused masses, the elements and principles of which become known to us later by analysis. Thus we must advance from generalities to particulars...[as] a child begins by calling all men 'father', and all women 'mother', but later on distinguishes each of them."

In the language of NLP, the process Aristotle is describing is that of 'chunking'. It seems that Aristotle's strategy to get to 'first principles' is to "advance from generalities to particulars" by starting with the largest 'chunks' which are available to sensory perception and to go through an analytical process that chunks this experience down into its "simplest," most basic, content free elements.

If we follow Aristotle's lead, our goal in this study of the strategies of genius would be to 'chunk down' the information we have about genius in order to find its "primary conditions or first principles" by identifying its "simplest elements." In other words, a 'strategy of genius' would define the 'basic conditions' and 'first principles' of the processes related to genius in terms of its primary elements. Of course, it is **how**, **specifically**, one distills these "rather confused masses" of information into their "simplest elements" and first principles that is our challenge.

Asking Basic Questions

According to Aristotle, the discovery of these basic elements and principles "become known" through the "analysis" (from the Greek *analytica* meaning "to unravel") of our perceptions. In his book *Posterior Analytics* Aristotle gives some specific descriptions of his analytical approach. Like his teacher and mentor (and fellow genius) Plato, Aristotle's process of analysis began by asking basic questions. Clearly, the kind of questions one asks will determine the kinds of answers one finds. According to Aristotle:

"The kinds of question we ask are as many as the kinds of things which we know, They are in fact four: - (1) whether the connection of an attribute with a thing is a fact, (2) what is the reason of the connection, (3) whether a thing exists, (4) what is the nature of the thing."

“Thus, when our question concerns a complex of thing and attribute and we ask whether the thing is thus or otherwise qualified - whether, e.g. the sun suffers eclipse or not - then we are asking as to the fact of a connection...On the other hand, when we know the fact we ask the reason; as, for example, when we know the sun is being eclipsed and that an earthquake is in progress, it is the reason of eclipse or earthquake into which we enquire. Where a complex is concerned, then, those are the two questions we ask; but for some objects of inquiry we have a different kind of question to ask, such as whether there is or is not a centaur or a God....On the other hand, when we have ascertained the thing's existence, we inquire as to its nature, asking, for instance, ‘what, then, is God?’ or ‘what is man?’

“These, then are the four kinds of questions, and it is in the answers to these questions that our knowledge consists.”

To apply Aristotle's strategy to the study of genius, we must continually pose these four basic questions (in this case, the ‘thing’ we are exploring is ‘genius’). Rearranging the order of Aristotle's questions slightly, we must ask:

1. Does ‘genius’ in fact exist?
2. If so, what is the nature of ‘genius? What are its ‘attributes’?
3. When we have identified what we think are the ‘attributes’ of genius we must then ask, “Are those attributes in fact connected to ‘genius?’”
4. If so, what is the reason or cause for the connection?

Aristotle's purpose in asking these four questions was not really to end up with four different answers, but rather to converge upon a single answer - a ‘first principle’. According

to Aristotle, “to know a thing's nature is to know the reason why it is.”

“[T]he nature of the thing and the reason of the fact are identical: the question ‘What is eclipse?’ and its answer ‘The privating of the moon's light by the interposition of the earth’ are identical with the question ‘What is the reason of eclipse?’ or ‘Why does the moon suffer eclipse?’ and the reply ‘because the failure of light through the earth's shutting it out’.”

This implies a powerful relationship between knowledge and application in Aristotle's system. It indicates that there is an equivalence between ‘attributes’ and ‘reasons’. In other words, if we say something like “Genius is knowing the right questions to ask” then we should also be able to say, “Knowing the right questions to ask is the reason for genius.” A true ‘first principle, then, is one that has this dual ability; not only is it ‘instructive’ it is also ‘instrumental’. That is, not only does such a principle allow us to understand something, it also informs us how it is brought about and influenced.

These basic elements that were both ‘attributes’ and ‘reasons’ for something were what Aristotle called the ‘middle’ - something in between general knowledge and specific instances. Even though Aristotle maintained that we must “advance from generalities to particulars,” we cannot simply stop with the particulars. As Aristotle put it, “*perception must be of a particular, whereas scientific knowledge involves the recognition of the commensurate universal.*” Once we have ‘chunked’ something down into its particulars, we must then ‘chunk back up’ again to find the ‘middle’. According to Aristotle, “*all questions are a search for a ‘middle’*” which connects the “universal” to “a particular”.

"[I]n all our inquiries we are asking either whether there is a 'middle' or what the 'middle' is: for the 'middle' here is precisely the cause, and it is the cause that we seek in all our inquiries. Thus, 'Does the moon suffer eclipse?' means 'Is there or is there not a cause producing eclipse of the moon?', and when we have learnt that there is, our next question is, 'What, then, is this cause?'"

By Aristotle's reasoning, the question 'Does Aristotle possess genius?' means "Is there or is there not a cause producing genius in Aristotle?" If we answer the first question by saying, "Aristotle possessed genius because he asked basic questions," we are simultaneously implying, "Asking basic questions is the cause of Aristotle's genius." The 'cause' (asking basic questions) is the 'middle' or link between the general property of 'genius' and the 'particular' instance of 'Aristotle'. Defining a 'first principle' is establishing such a cause.

The Strategy for Finding the 'Middle'

Once we begin asking such questions, we need a method for arriving at relevant and meaningful answers. We might well wonder, "How exactly does one go about this business of finding causes, first principles, basic conditions and the 'commensurate universal' within the particulars?" In *Posterior Analytics* Aristotle provides a specific description of his strategy for 'chunking back up' from the particulars to find more 'universal' attributes.

"We must start by observing a set of similar - i.e. specifically identical - individuals, and consider what element they have in common."

To illustrate, Aristotle gives the following example:

"If we were inquiring what the essential nature of pride is, we should examine instances of proud men we know to see what, as such, they have in common; e.g. if Alcibiades was proud, or Achilles and Ajax were proud, we should find what they had in common, that it was intolerance of insult; it was this which drove Alcibiades to war, Achilles to wrath, and Ajax to suicide."

Alcibiades, Achilles and Ajax are "specifically identical individuals" because they were all Athenian military leaders that took fairly rash actions that were motivated by 'pride'. In his illustration, Aristotle chooses three individuals to use as examples. While he does not himself state that this particular number of examples is significant, it would seem that if there were fewer, one could not be sure if the set was large enough to produce a similarity that was basic enough. If one tries to compare too many examples, it becomes confusing and unwieldy.

Once we have found what is similar in our first set of examples, Aristotle tells us:

"We must then apply the same process to another set of individuals which belong to one species and are generically but not specifically identical with the former set."

Continuing with his illustration about the examination of 'pride' Aristotle explains:

"We should next examine other cases [of proud men], Lysander, for example, or Socrates."

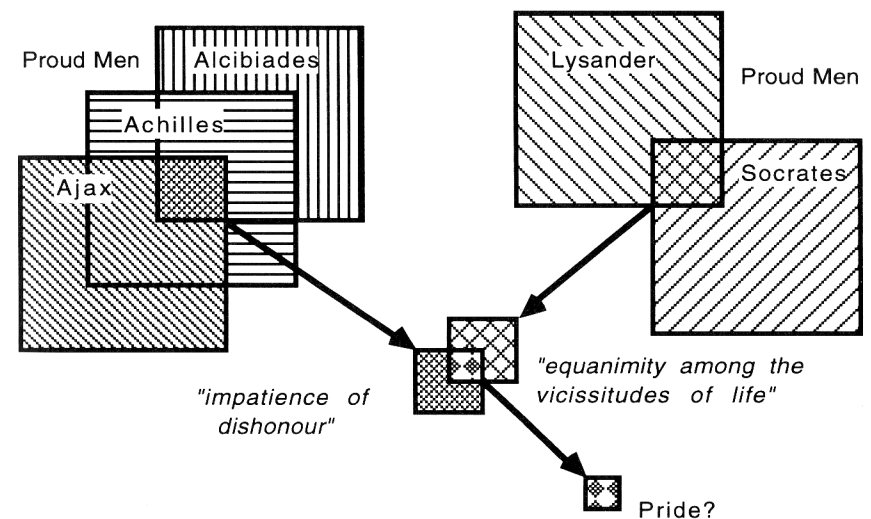
Lysander and Socrates are of the same species (men) and “generically identical” to Alcibiades, Achilles and Ajax because they are also known as ‘proud’. They are not specifically identical, however, in that Lysander was a Spartan military leader and Socrates was a philosopher.

As the next step in his strategy, Aristotle finds whatever similarities there are between the individuals of the second group:

“When we have established what the common element is in all members of this second species, we should again consider whether the results established possess any identity, and persevere until we reach a single formula, since this will be the definition of the thing. But if we reach not one formula but two or more, evidently the definiendum cannot be one thing but must be more than one.”

What Aristotle means by “identity” is some quality that is shared by both groups of individuals that we are comparing. As he explains:

“If [Socrates and Lysander] have in common indifference alike to good and ill fortune, I take these two results and inquire what common element have equanimity amid the vicissitudes of life and the impatience of dishonor. If they have none, there will be two genera of pride.”



Aristotle's Strategy for Finding First Principles.

In summary, Aristotle's strategy for analysis involves an 'inductive' process made up of the following steps:

- 1) Collecting together a group of similar examples of something that each share the quality to be analyzed;
- 2) Comparing the examples and looking for some quality that they all have in common;
- 3) A second group of different examples that also share the quality is then collected together and compared in the same manner;
- 4) The quality that unified the first group is compared with the quality that unified the second group in order to find what quality, if any, they might share.

If the unifying quality of *group 1* has something in common with the unifying quality of *group 2* we have gotten another step closer to a 'first principle'.

Presumably the process could continue on with other groups until we have discovered the one quality that all examples of the phenomenon have in common. Each successive comparison should lead us to smaller and smaller chunks composed of simpler and more content free elements. The group of examples is a fairly large 'chunk' size. The quality which unifies this group is smaller and simpler. The quality which is common to the unifying elements of both *group 1* and *group 2* should be a smaller and simpler chunk still, and so on.

To apply Aristotle's strategy to the study of 'genius' instead of 'pride' we would first identify a set of 'specifically identical individuals' who all share that characteristic. For instance, we might select a set of scientists who are considered to have possessed the quality of 'genius' - such as Albert Einstein, Nicola Tesla, Gregory Bateson; even Aristotle himself. We would then consider what 'elements' they have in common.

Then, we would repeat the process with another set of individuals who are 'generically but not specifically identical'. For instance, we might choose individuals who are also considered geniuses but who were creative or artistic people instead of scientists - Wolfgang Amadeus Mozart, Leonardo da Vinci and Walt Disney, for example. We would then seek to find what these three had in common.

The next step would be to find out if the common attributes or elements of the scientists also had something in common with the shared attributes of the creative or artistic individuals. If they don't, we may end up concluding that scientific and artistic genius are in fact two separate 'genera' of genius. If the two groups do share common attributes we will have found a potential 'basic condition or first principle' of genius. We might then repeat the process with another set of 'geniuses' such as therapists or healers - like Milton H. Erickson, M.D., Sigmund Freud and Moshe Feldenkrais.

In many ways the structure of this series on genius has been based on just this strategy.

'Syllogisms' as Expressions of 'First Principles'

Of course, finding the common elements and causes, is only a first step. We must also be able to express our conclusions and assess their relevance and usefulness. Aristotle's recognition as a genius did not come merely from what he knew, but from what he was able to express about what he knew. In fact, his ability to express first principles was as important as his ability to find them. Aristotle's strategy for identifying the relationship between the general and the particular by finding the 'middle' or the cause was the basis of his famous 'syllogisms'. Aristotle formulated the 'syllogism' as a linguistic structure to express the principles which resulted from his analysis. In *Prior Analytics* Aristotle explained:

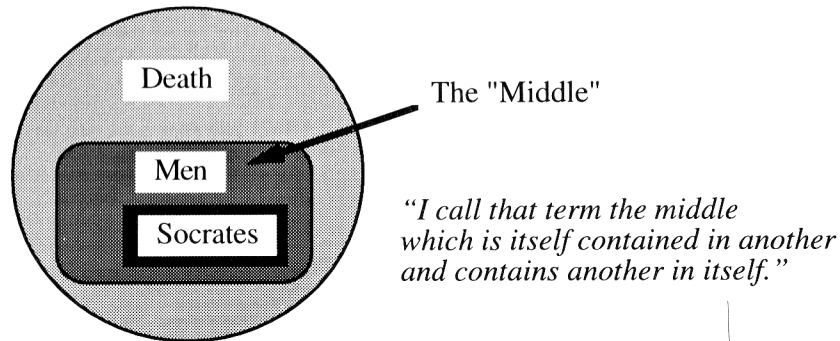
"A syllogism is discourse in which, certain things being stated, something other than what is stated follows of necessity from their being so."

In essence, a syllogism provides the bridge between knowledge and its application by focusing on the consequences of that knowledge. Expressed in this way, knowledge becomes an 'instrument' or what Aristotle called *organon* (meaning "tool").

Once a principle has been identified through the 'inductive' strategy described earlier, it may be applied 'deductively' through the structure of the syllogism. A 'syllogism' defines the relationship between 'things' and the 'attributes' that accompany them. Specifically, a syllogism relates the attributes of a general class to the 'particular' members of that class, as in the classic example:

e.g. *All Men die.*
 Socrates is a Man.
 Socrates will die.

The 'middle' term is the attribute or cause that unites the class and its individual members. According to Aristotle, "I call that term the middle which is itself contained in another and contains another in itself."



Definition of the "Middle" Term in a Syllogism

In the Socrates example, being a 'man' is one of the attributes that relates the particular individual 'Socrates' to the primary condition of 'dying'. Stated generally, the structure of a syllogism would be something like:

A phenomenon or class of things has a certain attribute or cause.

A particular situation or individual possesses that attribute or cause.

That particular situation or individual will be an example or manifestation of the phenomenon or class of things.

Linguistically, a syllogism typically has three "terms"; the two 'extremes' **A** (the general phenomenon) and **C** (the

specific individual or instance), and the 'middle' **B** which connects C to A. For instance, with regard to the example of the 'eclipse' Aristotle explained, "Let *A* be the eclipse, *C* the moon, and *B* the earth's acting as a screen. To ask whether the moon is eclipsed or not is to ask whether or not *B* has occurred."

Thus, in order to become a 'tool', the results of an inquiry need to be put into a structure such that:

B is an attribute or cause of the general phenomenon **A**.

C is a specific instance possessing the attribute or cause **B**.

C is an example or expression of **A**.

In terms of our study of genius, if 'asking fundamental questions' is an 'attribute' and 'cause' (**B**) of 'genius' (**A**), we could form a syllogism of the following structure:

Asking fundamental questions (**B**) is an attribute of genius (**A**).

Aristotle (**C**) asked fundamental questions (**B**).

Aristotle (**C**) was a genius (**A**).

Structured in this way, Aristotle believed knowledge could be applied and put into action.

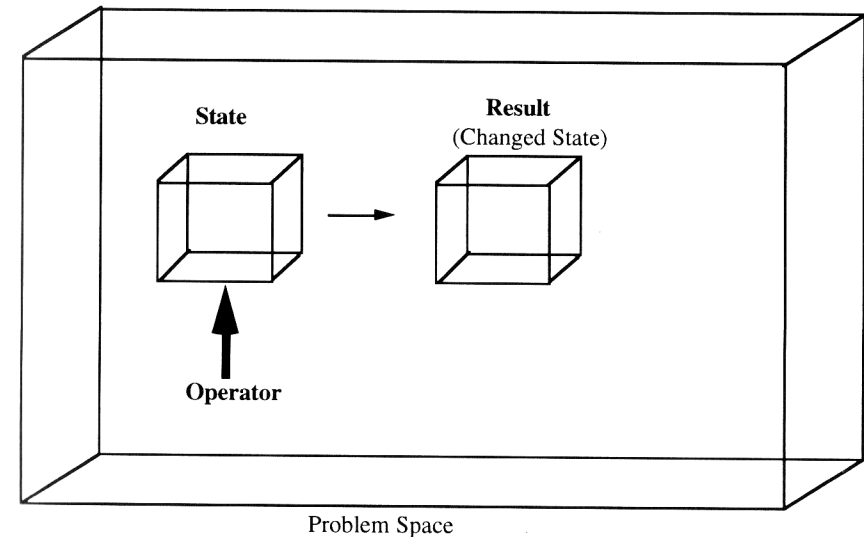
The S.O.A.R. Model

In many ways, Aristotle's process reflects some of today's most advanced artificial intelligence models. In particular, it is remarkably similar to the S.O.A.R. model. S.O.A.R. is a general problem solving model and learning system that was originally developed by Allen Newell, Herbert Simon, and Clifford Shaw in the 1950's. It was first used to create the computer chess playing programs by teaching the computer how to become a chess expert by learning from its experience through remembering how it solved problems. These expert chess programs have been the most successful application of artificial intelligence to date.

S.O.A.R. stands for State-Operator-And-Result. It defines the basic steps involved in the process of change in any system. A 'state' is defined in relationship to some larger 'problem space'. 'Operators' stimulate change in the state by altering some aspect of it 'resulting' in a new state. The desired state is reached through a path of 'transition states' which culminate in the goal.

"According to the model, all the mental activity being devoted to a given task takes place within a cognitive arena called the problem space. A problem space in turn consists of a set of states, which describe the situation at any given moment, and a set of operators, which describe how the problem solver can change the situation from one state to another. In chess, for example, the problem space would be [the set of parameters which define] "a chess game" [such as the two opponents, the chess board, etc.], a state would consist of a specific configuration of pieces on the chess board, and an operator would consist of a legal move, such as "Knight to King-4." The task of the problem solver is to search for the sequence of operators that will take it from a given initial state (say, with the

pieces lined up for the start of the chess game) to a given solution state (the opponent's king in a checkmate)." (Waldrop, 1988)



Basic Elements of the S.O.A.R. Model

Once the relevant parameters have been defined the problem solver must formulate a guidance strategy in order to find the sequence of operators that will lead from the starting state to the goal state. This takes place through a set of prioritized condition-action rules in the form of "IF you perceive a certain state, THEN apply a certain sequence of operators." If an impasse is reached such that progress is not able to be made to the goals state, the problem is 'chunked' down into sub-goals and sub-operations until a new path is found. These new 'chunks' are then remembered as other condition-action rules. Following this course, the problem solver moves from a Trial-and-Error guidance strategy (nov-

ice), through Hill Climbing (doing what seems best at the time) to one involving Means-Ends analysis (expert).

The S.O.A.R. structure lies at the core of the NLP modeling process. The S.O.A.R. distinctions give us the meta strategy or meta model from which to identify and define effective macro and micro strategies. The S.O.A.R. provides a very basic framework with which to model effective performance in many diverse areas of activity. In a computer, for example, the computer hardware creates a *problem space* which can produce many different *states*. Computer software instructions serve as *operators* which produce changes in these states in order to produce specific results.

Another example could be that of preparing a meal. The kitchen defines a problem space in which various stages or states of food preparation take place. The cooking tools and utensils are the operators which produce changes in the state of the food. Each 'operation' leads to a result which is then operated on again, until the final meal is produced. A third example can be derived from the opening passage from Genesis quoted at the beginning of this book. 'Heaven and Earth' define a problem space that God operates on to produce a set of successively more refined states, resulting in the creation of 'man and woman'.

Aristotle's approach to knowledge acquisition was very similar to the S.O.A.R. model. Physics, logic, rhetoric, politics, etc. are all 'problem spaces'. Aristotle set out to define those problem spaces by identifying the "*principles, conditions and elements*" from which they were made. The phenomena which make up each field would be the various states within the problem space. Like the basic learning process of the S.O.A.R., Aristotle 'chunked down' from "generalities to particulars" successively elaborating more details. The "middle terms" and "causes" that Aristotle sought are similar to the operators which determine and influence the states within the problem space. Aristotle's syllogisms are like the 'condition-action' rules through which knowledge is accumulated in the S.O.A.R. structure.

Thus, our modeling of the meta strategies of various geniuses must include how they perceived and conceptualized the problem space in which they were operating. It must also include how they identified and 'chunked' the relevant desired states and transition states within that space. Finally, and most importantly, we must identify the operators they used to create their paths through the problem space to achieve their desired states.

Basic Types of Causes

The common 'elements', 'middle terms' and "causes" Aristotle was constantly seeking are essentially the 'operators' of the S.O.A.R. model. When we ask, "What was the 'cause' of Einstein's genius, or Mozart's genius, or Leonardo's genius, or Aristotle's genius," we are essentially asking "Which operators or operations enabled them to achieve the intellectual and artistic feats for which they are known?" A basic issue for this study, then, relates to the types of operations or causes that might be relevant.

According to Aristotle (*Posterior Analytics*) there were four basic types of causes: 1) "formal" causes, 2) "antecedent," "necessitating" or "precipitating" causes, 3) "efficient" or "constraining" causes and 4) "final" causes.

Formal Causes

Formal causes essentially relate to fundamental definitions and perceptions of something. The "formal cause" of a phenomenon is that which gives the definition of its essential character. We call a bronze statue of a four legged animal with a mane, hooves and a tail a "horse" because it displays the form or 'formal' characteristics of a horse. We say, "The acorn grew into an oak tree," because we define something that has a trunk, branches and a certain shape of leaves as being an 'oak tree'."

Formal causes actually say more about the perceiver than the phenomenon being perceived. Identifying formal causes involves uncovering our own basic assumptions and mental maps about a subject. When an artist like Picasso puts the handlebars of a bicycle together with the bicycle seat to make the head of a 'goat' he is tapping into 'formal causes' because he is dealing with the essential elements of the form of something.

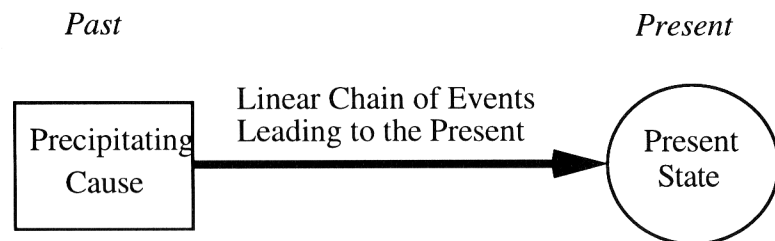
This type of cause is related to what Aristotle called "intuition." Before we can begin to scientifically investigate something like physics, ethics, pride or genius, we have to have the idea that such phenomena might possibly exist. Even choosing our examples of 'prideful' people implies that we have the intuition that these individuals are examples of what we are looking for. As Aristotle pointed out:

"[I]t will be intuition that apprehends the primary premises - a result which follows from the fact that demonstration cannot be the originative source of demonstration, nor, consequently, scientific knowledge of scientific knowledge...intuition will be the originative source of scientific knowledge."

Identifying the formal causes of genius, for instance, would involve examining our basic definitions, assumptions and intuitions about genius. For example, we could say, "Aristotle was a genius because we define people who have influenced our society in such a basic and widespread fashion as 'geniuses'." Modeling the formal causes of genius for a particular person would involve identifying that person's basic assumptions about the area or areas in which his or her genius was expressed.

Antecedent Causes

Antecedent or precipitating causes relate to past events, actions or decisions that influence the present state of a thing or event through a linear chain of 'action and reaction'. This is probably the most common form of causal explanation that we use to describe things. For instance, we say, "The acorn grew into an oak tree because the man planted it, watered it and fertilized it." "The man cut down the tree because he had recently bought a new axe." Or "The tree fell because the man chopped a deep cut in its trunk with his axe."

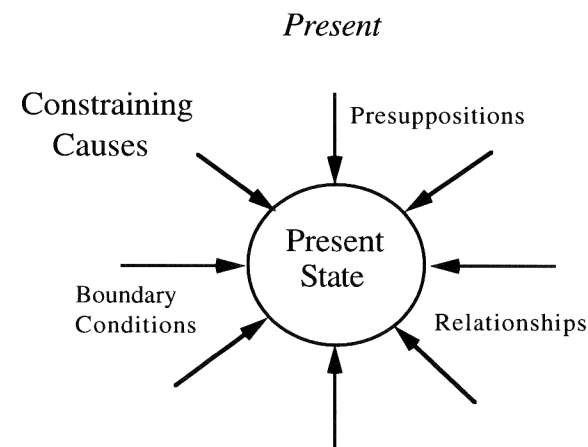


Antecedent or Precipitating Cause

Seeking the precipitating causes of genius would involve looking for the chain of events in various geniuses' personal histories that lead to the development of their exceptional abilities - such as their genetics or their experiences. For example, we could say, "Aristotle's genius was caused by his training at the Academy in Athens with Socrates and Plato, and by the interest in biology and science that he inherited from his father who was a court physician."

Constraining Causes

Constraining causes involve ongoing relationships, presuppositions and boundary conditions (or lack of boundaries) within a system which maintain its state (regardless of the chain of events that brought it there). For instance, applying this kind of cause, we might say, "The acorn grew into an oak tree because there was no significant competition for water and light from the trees surrounding it." "The man cut down the tree because the weather constrained him from traveling deeper into the woods to select another tree." "The tree fell because the gravitational field of the Earth pulled the tree toward its center and held it against the ground."



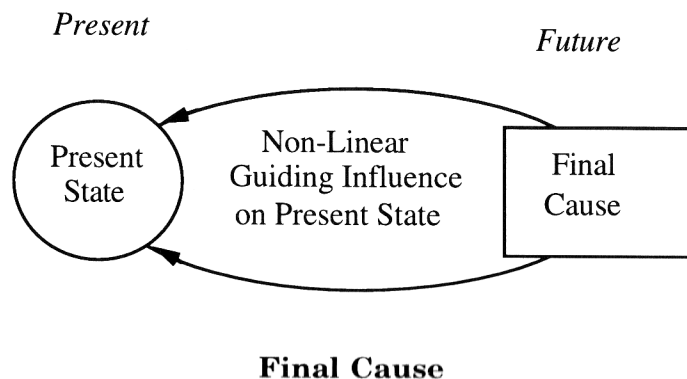
Efficient or Constraining Causes

Seeking the constraining causes of genius would involve examining the conditions surrounding a person at the time his or her genius was being expressed - such as the prevailing social conditions and the reaction and support they received from others around them. For example, we could say, "Aristotle was a genius because he was given both the opportunities and the focus to follow his interests by the Athenian system of government and by his position as a tutor to Alexander the Great. He had no significant competitors because only a few people had even begun to think scientifically during that age and education was still rare except for the upper class. Many of his key works were recorded from his lectures and written and edited by his students." Constraining causes tend to be more 'systemic' in nature, and may be defined in terms of potential constraints which were not present as well as those which were.

Final Causes

Final causes relate to future objectives, goals or visions which guide or influence the present state of the system giving current actions meaning, relevance or purpose. Final causes involve the motives or 'ends' for which something exists. In this sense, final causes often relate to a thing's role or 'identity' with respect to the larger system of which it is a part. In his biological researches especially, Aristotle focused on this type of causation - the intentional aim or end of nature - which he held to be distinct from the mechanical causation also operative in inorganic phenomena. Thus, while Aristotle tended to seek antecedent causes in cases of mechanical and non-living phenomena, he found final causes more relevant for mental and biological phenomena, claiming, "*mind always does whatever it does for the sake of something, which something is its end.*"

He noted that, if one burns an acorn, he destroys it in a mechanical way but that, if he gives it a chance, it turns *itself* into an oak. Thinking in terms of this kind of cause we might say, "The acorn grew into a tree because its nature is to become a tree." "The man cut down the tree because he wanted to be warm and needed wood to make a fire." "The tree fell because it was destined to provide support to other creatures on this planet."



Seeking the final causes of genius would involve considering the intended goals, purposes and desired results that guided or inspired the thoughts and actions of the individuals we are studying. It would also involve considering the individuals' perceptions of their own identity within the environmental and social systems they were operating. For example, we could say, "Aristotle's genius was caused by his constant desire to discover and share the first principles which united and brought balance to all of the phenomena of the natural world."

Clearly, any one of these causes taken to be the whole explanation by itself is likely to lead to an incomplete picture. In today's science we look mostly for mechanical causes, or what Aristotle referred to as 'antecedent' causes. When we study a phenomenon scientifically we tend to look for the linear cause-and-effect chain which brought it about. For instance, we say "Our universe was caused by the 'big bang' which happened billions of years ago." Or we say, "AIDS is caused by a virus that enters the body and interferes with the immune system." Or "This organization is successful because it took those particular steps at those particular times." These understandings are certainly important and useful but do not necessarily tell us the whole story of these phenomena.

Identifying the formal causes of the "universe," a "successful organization" or "AIDS" would involve examining our basic assumptions and intuitions about the phenomena. What exactly do we mean when we talk about our "universe" or about "success," an "organization" or about "AIDS?" What are we presupposing about their structure and their "nature?" (These were the type of questions that lead Albert Einstein to reformulate our whole perception of time, space and the structure of the universe.)

Identifying constraining causes would involve examining what holds a particular phenomenon's current structure in place, regardless of what brought it there. Why is it, for

instance, that many people who have the AIDS virus do not manifest any physical symptoms? If the universe has been expanding after the 'big bang', what determines the current rate at which it is expanding? What constraints will cause the universe to stop expanding? What are the current constraints or lack of constraints that could cause an organization to fail or suddenly take off, regardless of its history?

Searching for final causes, would involve exploring the potential aims or ends of these phenomena with respect to the rest of nature. For instance, is AIDS simply a scourge, is it a lesson, or is it an evolutionary process? Is God "playing dice" with universe, or is it heading toward something? What are the visions and goals that make an organization successful?

These same kinds of considerations are relevant to our study of genius. Attempting to find the *formal causes* of genius leads us to view it as a function of the definitions and assumptions we apply to a person's life and actions. Looking for *precipitating causes* leads us to see genius as a result of special events and experiences within a person's life. Seeking *constraining causes* leads us to perceive genius as something brought out by unique or extraordinary conditions within which the person was living. Considering *final causes* leads us to perceive genius as a result of a person's motives or destiny.

The Role of Time Perception

It seems clear that Aristotle's various types of causes imply different relationships between phenomena in 'time'. Antecedent causes relate to the 'past' while final causes relate to the 'future'. Constraining causes relate to the 'present'. Formal causes are the only ones not directly related to time.

For Aristotle, the perception of 'time', like other concepts, was a 'tool' to be used in different ways. In fact, in his book, *Physics*, he even somewhat humorously questions the existence of time:

"[T]he following considerations would make one suspect that [time] either does not exist at all or barely, and in an obscure way. One part of it has been and is not, while the other is going to be and is not yet. Yet time - is both infinite time and any time you like to take - is made up of these. One would naturally suppose that what is made up of things which do not exist could have no share in reality."

Certainly, one of the key outcomes of the modeling process is to organize sequences of relevant cognitive and behavioral influences with respect to time. The way in which one organizes and places events in time can greatly influence the effects they are perceived to have.

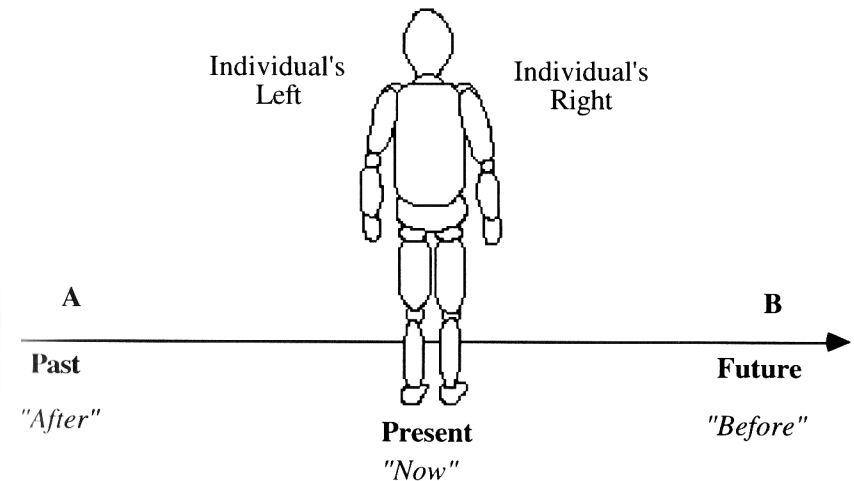
In the same way that Aristotle distinguished between the relevance of different types of causes with respect to organic versus mechanical process, he appears to have had different ways in which he perceived the influence of time with regard to different types of phenomena. For mechanical causation, Aristotle tended to apply the traditional view of time as something linear. Antecedent causes, for instance, formed a linear sequence of reactions. He explains:

"We apprehend time only when we have marked it by motion, marking it by 'before' and 'after'; and it is only when we have perceived 'before' and 'after' in motion that we say that time has elapsed. Now we mark them by judging that A and B are different, and that some third thing is intermediate to them. When we think of the extremes as different from the middle and the mind pronounces that the 'nows' are two, one before and one after, it is then that we say there is time...For what is bounded by the 'now' is thought to be time...For time is just this - number of motion in respect of 'before' and 'after'...there is a correspondence with the point; for the point also both connects and terminates the length - it is the beginning of one length and the end of another."

This perception of time as "points" on "lengths" of a line for quantifying events, such that the present or "now" is "after" the past (A) and "before" the future (B), has been picked up and used by scientists and planners ever since. In fact, "time lines" have become the primary mode of thinking about time in Western Society.

In the basic model of NLP, there are two fundamental perspectives one can have with respect to time: perceiving something "in time" or "through time."¹

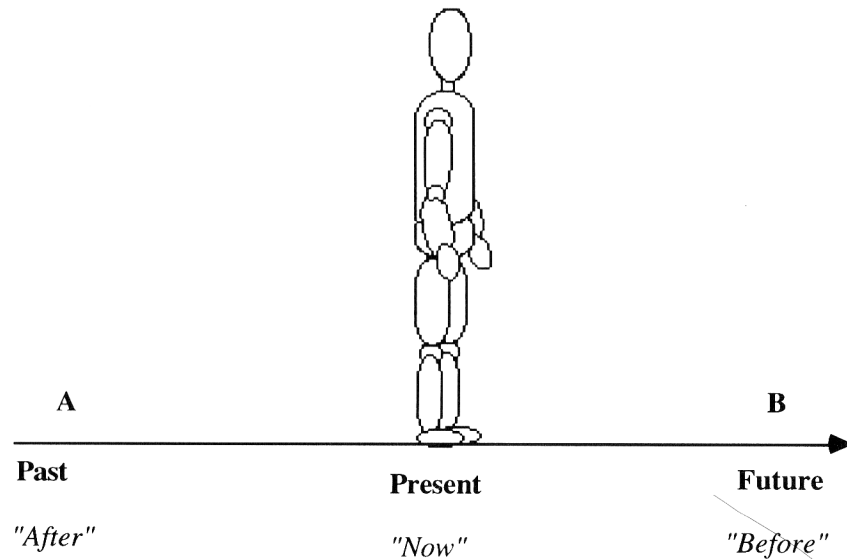
¹ The notion of the "in time" and "through time" time lines first developed in NLP in 1979 with the advent of the so called "meta program" patterns. Exploration of other forms of time perception took place in the early 1980's by individuals such as Richard Bandler and myself. Specific applications of time lines in the form of techniques began in the mid to late 1980's; most notably by Tad James and Wyatt Woodsmall (1987), Steve and Connirae Andreas (1987) and my own work involving the physicalization of time lines (1987).



"Through Time" Time Line

When one perceives an event "through time" one takes a vantage point that is outside of the sequence of events, disassociated from whatever is being observed or modeled. From this perspective, the 'time line' is typically viewed such that the 'before' and 'after' are lines extending off to the left and right, with the 'now' being somewhere in the middle.

Perceiving an event "in time" involves taking a vantage point associated within the event that is unfolding. From this perceptual position, the 'now' is one's current physical position with the future represented as a line extending off in the direction one is facing and the past trailing behind - such that one is walking into the future and leaving the past behind.



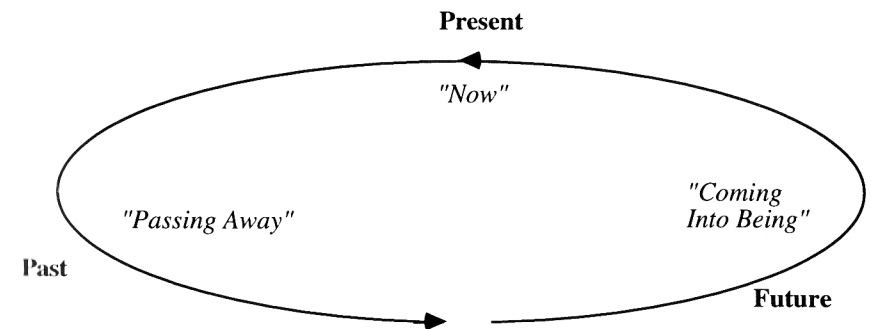
"In Time" Time Line

The two perspectives (which may be represented either visually or through the use of actual physical space) create different perceptions of the same event. The "through time" perspective is effective for quantitative analysis, but is more passive because it is disassociated. The "in time" perspective is more active and involved but makes it easier to "lose sight of the whole."

In Aristotle's view, though, these linear methods of perceiving and measuring time were only one way; that were primarily of value with respect to mechanical causes. He considered the influence of time with respect to biological and mental phenomena in a different way:

"[There is a] common saying that human affairs form a circle, and that there is a circle in all other things that have a natural movement of coming into being and passing away. This is because all other things are discriminated by time, and end and begin as though conforming to a cycle; for even time itself is thought to be a circle...So to say that things that come into being form a circle is to say that there is a circle of time; and to say that it is measured by circular movement."

Thus, time that relates to mechanical processes based on the perception of 'before' and 'after' bounded by the 'now' may be represented by the classical 'time line'. However, time that relates to more organic processes involving the "natural movement of coming into being and passing away" may be best represented in the form of circles and "cycles."



"Circular" or Cyclic Time Line

These different ways of perceiving time will tend to focus our attention on different types of causes. The 'through time' time line, for instance, leads us to perceive antecedent or precipitating causes. An 'in time' perspective emphasizes

constraining causes. A cyclic time line would tend to bring out final and formal causes.

Similarly, different types of time lines tend to be more appropriate for different levels of processes. For instance, preparing to enact physical behaviors can be best done via an 'in time' time line. Planning a course of action or considering one's capabilities requires the broader perspective of the 'through time' time line. Processes related to beliefs and identity are often best represented in the form of cycles, as they tend to involve recurring patterns rather than one time linear events.

In our study of genius, it appears that it will be important to consider the relevance of time from all of these different perspectives. A "through time" time line will enable us to identify and describe specific and discrete sequences of steps. An "in time" time line will aid us to more easily step into the shoes of the geniuses we are modeling and see their actions in history as they experienced them. Perceiving events in the "circle" or "cycle" of time will help us to recognize recurrent patterns, view processes as whole and to identify how the different steps relate to the "natural movement" of the whole.

Evaluating One's Premises

Searching for different types of causes leads us to reaching different types of conclusions; and considering events with respect to different ways of representing time will alter our perceptions of them. Thus, it seems clear that one needs some way to assess or evaluate the conclusions that one arrives at through one's explorations. According to Aristotle, the key to the effectiveness of our conclusions about a principle is the strength and 'universality' of the relationship between a phenomenon and the attributes or causes that we have discovered. This relationship is what Aristotle called the "premise" of the conclusion.

*"Every premise states that something either **is** or **must be** or **may be** the attribute of something else; of premises of these three kinds some are affirmative, others negative."*

In the first case, we can state what something is or what it is not. For example, we can say that a human being *is* an animal, and a human being *is not* a vegetable.

With respect to the second type of premise, we can state that a human being *must have* the capacity for language, and a human being *must not have* a tail.

In the third type of premise, we can say that some human beings *may be able to* sculpt statues, or some human beings *may not be able to* speak Greek.

These different types of premises are essentially the first two terms of a 'syllogism' - (A) the general phenomenon and (B) the 'middle' or the causes and attributes associated with that phenomenon. The validity of these two terms determines the validity of any conclusions drawn from them.

The first test for these various premises was in what Aristotle called their "convertibility":

“It is necessary then that in universal attribution the terms of the negative premise should be convertible, e.g. if no pleasure is good, then no good will be pleasure;

the terms of the affirmative must be convertible, not however universally, but in part, e.g. if every pleasure is good, some good must be pleasure;

the particular affirmative must convert in part (for if some pleasure is good, then some good will be pleasure); but the particular negative need not convert, for if some animal is not man, it does not follow that some man is not animal.”

From Aristotle's point of view, then, the evaluation of a 'first principle' essentially involved looking for 'counter examples' or exceptions to the rule, which challenged its 'universality' by utilizing the process of 'conversion'.

However, the validity of the conversion had to be backed up by observation. Aristotle believed the only effective 'proof' of a first principle was through "demonstration." Once a principle was formed, it had to be applied and validated through experience. In other words, the map must be shown to be useful by the degree to which it helps us navigate the territory. As Aristotle claimed in *On the Generation of Animals*, "credit must be given to observation rather than to theories, and to theories only insofar as they are confirmed by the observed facts."

The value of the process of conversion is that it tells us where to look to find possible counter examples. Thus, if we say, "All birds have wings," then we should not find any birds that do not have wings. But we may find animals with wings that are not birds. If we say, "No birds are featherless," then we should not find any featherless creature that is a bird.

The essential structure of finding counter examples through the principle of conversion involves checking the strength of

the relationship implied by the premise. For instance, a premise will be something like:

All **A** have **B**
or
A causes **B**

To seek counter examples we would first ask:

Is there any **A** that does *not* have **B**?

or

Is there any **A** that does *not* cause **B**?

Next we would 'convert' the terms and ask:

Is there anything that has **B** that is *not* **A**?

or

Is there any **B** that is *not* caused by **A**?

For an attribute to be truly definitive, we should find no counter examples. For instance, not all birds fly, but all birds have wings. However, not all animals with wings are birds; insects, bats and some dinosaurs also have or had wings. But if we say that all animals with wings *and* beaks are birds, it will be more unlikely that we will find counter examples; i.e., animals that are not birds that have wings and beaks.

We can apply this same assessment process to our study of the strategies of genius. After posing a hypothesis (based on finding 'common elements' within a number of examples) in the form of a premise, we would then look for any potential counter examples. So, if we find that "All geniuses ask basic questions," then we should see if there are any examples of geniuses that do not ask fundamental questions. Did Mozart, for example, ask fundamental questions? If so, which ones? We should also find out if there are people who ask fundamental questions who are not geniuses. The fewer counter examples there are, the more 'universal' the attribute or cause is.

Finding a counter example, by the way, does not mean that our premise is 'wrong', it generally means that the system or phenomenon we are exploring or studying is more complex than we are perceiving it to be, or that we have not yet reached its simplest elements.

Aristotle's Model of the Mind

Seeking universal causes and attributes presupposes that we must know which elements to look for as possible causes or attributes. And according to Aristotle's prescriptions, we must look for the "simplest elements." What are the simplest elements making up the 'causes' and 'attributes' of genius? Clearly they have to do with the 'mind'. And while Aristotle did not write about genius specifically, he had much to say about the nature of the mind.

In many ways, in fact, Aristotle was the first person to do NLP. Certainly he was the originator of many of the basic principles behind NLP. He was one of the first people in history to try to define and categorize the various aspects of the "mind" and the thinking process. In his book *On The Soul*, for instance, Aristotle maintained the way you know that something is alive, and thus has a 'soul' or 'psyche', is because it can sense things and it can move under its own power. He wrote:

"The soul of animals is characterized by two faculties, (a) the faculty of discrimination which is the work of thought and sense, and (b) the faculty of originating local movement."

The way you know something has a psyche is because it can sense features of its world, make discriminations about what it senses and it can originate movement in itself in relationship to the sensory discriminations it makes.

These basic distinctions fit well with the information processing model proposed by NLP - that the brain is like a microcomputer and functions via inputs and outputs. Movements are originated and directed by the mental discriminations we make about our inputs.

Unlike modern behaviorists, however, Aristotle did not think of this process as being a simple reflexive action. As we

mentioned earlier, he claimed that “*mind always does whatever it does for the sake of something, which something is its end.*” Thus, for Aristotle, all psychological experience was organized towards some end. As a result, sensing and discriminating differences in what we sense is always done in relationship to some goal. All sensing is given meaning in terms of this relationship to a ‘goal’. In other words, for Aristotle, psyche meant the ability to have a goal, to be able to sense your relationship to your goal and to be able to vary your behavior in order to achieve the goal.

William James (the American psychologist who is usually considered the father of cognitive psychology) similarly defined the mind as having the ability to have a fixed future goal and very broad choices with which to get to that goal.

“The pursuance of future ends and the choice of means for their attainment are thus the mark and criterion of the presence of mentality in a phenomenon.”

In the language of NLP, both Aristotle and William James were describing the T.O.T.E. process (Miller, et al, 1960) which says intelligent behavior is a function of having tests and operations that lead you in the direction of some fixed future goal - a “final cause.” Like the S.O.A.R., the T.O.T.E. model is fundamental to the NLP modeling process. It also complements the S.O.A.R. by defining the basic way in which operators are placed into action. A particular T.O.T.E. defines a distinctive pathway through the problem space. In this sense, the T.O.T.E. is the basic structure by which defines a person’s macro strategy.

The T.O.T.E. Model

T.O.T.E. stands for Test-Operate-Test-Exit. It defines the basic feedback loop through which we systematically change states. According to the T.O.T.E. Model, we generally operate on a state to change it in order to reach a goal. We continually test the ongoing state against some evidence or criteria to find out if we have achieved that goal. Depending on the result of this test we adjust our operations accordingly. That is, first you test your relationship to your goal. If you are not reaching your goal, you operate by varying your behavior in some way. Then you test the result of that movement again, and if you have been successful you exit to the next step. If not, you vary your behavior again and repeat the process.

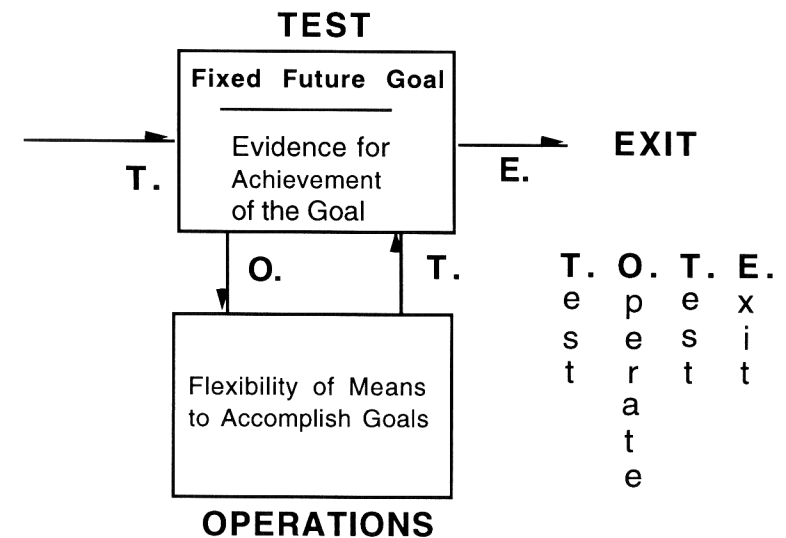


Diagram of the Basic T.O.T.E. Feedback Loop

Thus, in terms of the T.O.T.E. model, intelligent behavior is organized around the ability to establish:

- 1) A fixed future goal.
- 2) The sensory evidence necessary to accurately determine your progress toward the goal.
- 3) A variable set of means to get to your goal and the behavioral flexibility to implement these choices.

In relation to Aristotle's definition of the 'soul of animals', a living creature organizes its activity around the T.O.T.E. It 'discriminates' by testing its progress towards its goals or 'ends' through evidence provided by the process of sensory perception. If it is not achieving its goal or end, it 'moves' or operates to do something to try to reach that goal.

This is a profoundly different concept than the models of Skinner and Pavlov, who defined the process behind behavior as being that of reflexes and stimulus-response chains. For Aristotle mind is not reflex. The 'psyche' operates at a different level than that of simply receiving a stimulus that makes one respond; rather, stimuli are more or less irrelevant unless they relate to the goal or 'final cause'. In Aristotle's model, behavior is not stimulus driven, it is goal driven.

Aristotle's view certainly matches my own observations of my son when he was first learning how to move his body at a few months old. 'Stimuli' were irrelevant to him unless they fit in with some inner goal or purpose that he had. Rather than reflexively and mindlessly reacting to external stimuli, his movements centered around things that he was internally interested in. For example, there were some toys he exhibited preferences for from the outset and others he completely ignored initially. He only began to interact with them when he became interested in them as a result of relating them to some sort of inner goal or end that he had. Then he would interact with them through this T.O.T.E. feedback loop. When he wanted to get something, he 'tested' by looking at his hand in relationship to it, 'operated' by sort

of swiping his hand at it, missed, 'tested' again, swiped his hand again this time a little closer, and basically continued to test and operate until he got it. Then he 'exited' on to his next interest. Rather than stimulus-response, it was a goal driven feedback loop.

Studies of very young infants (Bower, 1985) in the first weeks and months of life, also tend to confirm Aristotle's view of behavior. In a typical experiment a child is sat in front of an "attractive" toy, such as a mobile. The toy moves intermittently depending on the child's activity. To stop the mobile the child has to lower his or her foot, breaking a light beam and preventing the mobile from turning. To start it again, the child has to lift his or her foot out of the light beam. Most babies become interested in the stopping and starting of the mobile, analyze the situation quite rapidly, and then notice the movement is caused by something they've done with their foot. They play around with both feet, and quickly realize what to do to make the event - the starting and stopping of the mobile - occur.

In the past, theorists assumed that the child was most interested in the event: the 'reinforcement' or reward which encouraged the child to learn; i.e. the mobile. But researchers became convinced it wasn't the event, it was figuring out how to control what was going on that was important to the child. Learning itself was reinforcing - the reinforcement was realizing how to interact with and influence the outside world.

By adjusting the experimental parameters researchers were able to test whether the child really was interested in his or her own control rather than the event itself. For instance, if the child's control is made less than perfect, so that by moving his or her foot the child doesn't always stop or start the mobile, then the child will carry on and on until he or she has solved the problem. Once the child has the solution he or she can become bored quite rapidly, except

occasionally to check that he or she still has power over the event.

There are two important points in this example; 1) the successful exercise of the “faculties” of “discrimination” and “originating local movement” is inherently self-reinforcing, and 2) the way an individual learns to influence the world is by interacting and adapting his or her own reactions in response to feedback.²

Macro Strategies and the T.O.T.E.

The T.O.T.E. provides the basic structure and distinctions for identifying and defining macro strategies for effective performances. The general structure of a computer program, for instance, could be described in terms of a specific T.O.T.E. A spell checking program, for example, has the goal of insuring correct spelling. It goes through all of the words in a body of text testing to see that each one meets the criteria it has been provided to determine correct spellings. If it detects an incorrectly spelled word, it operates to inform the writer and change the word.

In establishing the macro strategy for preparing a meal, the goal may be defined in terms of the particular kind of meal to be produced - say a holiday dinner. The food is tested for compatibility and taste, etc., then operated on accord-

² This tells us something important about using stimulus-response teaching methods or learning methods and not acknowledging the goal of the students. ‘Rewarding’ a student by giving him or her a good grade is likely to be ineffective unless the student wants to get a good grade. Giving money as a ‘reinforcement’ to someone won’t motivate him or her unless the person’s objective is to get more money. For instance, Mother Teresa would pursue her mission just as dilligently whether she was paid or not. According to the T.O.T.E. model there is no such thing as a real external reinforcement in the Skinnerian sense. Nothing is a reinforcement unless it is perceived in relationship to a goal coming from inside the person or animal.

ingly. There is even a macro strategy in the example provided by the opening quotation from Genesis. Each day is a kind of T.O.T.E. in which God sets out to accomplish a particular goal in his creation (“And God said, Let there be...”), operates to achieve it (“And God made...”) and then evaluates it (“And God saw that it was good”).

Modeling the ‘macro strategies’ of genius, involves identifying the way in which the individuals we are studying used the various elements of the T.O.T.E.:

- 1) What goals did they strive to achieve?
- 2) What types of evidence and evidence procedures did they use to get feedback in order to determine their progress toward their goals?
- 3) What set of means and operations did they employ to reach their goals?

Answering these questions will give us the ‘macro strategy’ of the individual. For example, based on what we have examined so far about Aristotle, we could define his macro strategy in the following way:

- 1) Aristotle’s goal was to find the “first principles” in all aspects of the natural world.
- 2) Aristotle’s evidence involved having premises that were both logical (‘convertible’ and without obvious counter examples) and ‘demonstrable’.
- 3) Aristotle’s operations involved a) exploring a problem space by asking basic questions, b) finding the ‘middle’ (basic causes and attributes which connected general principles to specific examples) through an inductive process that involved finding common elements shared by different examples of a particular phenomenon and c) forming the results into a syllogism that could be tested and demonstrated.

Micro Strategies And The Five Senses

Identifying micro strategies involves filling in the cognitive and behavioral details of how, specifically, a particular macro strategy is carried out. In the model of NLP, micro strategies relate to the way in which one uses his or her sensory 'representational systems', such as mental imagery, internal self talk, emotional reactions, etc., in order to carry out a task or T.O.T.E.

Like NLP, Aristotle identified the basic elements of cognitive process as intimately associated with our sensory experience. Aristotle's basic premise then was that, in order to fulfill their various goals, animals had to move and in order to move they needed sensory contact with the outside world to guide that movement in relation to their goals. This sensory contact formed the basis for what would become 'thought' and 'skill'. As he describes it in *Posterior Analytics*:

"[A]ll animals...possess a congenital discriminative capacity which is called sense-perception. But though sense-perception is innate in all animals, in some the sense-impression comes to persist, in others it does not. So animals in which this persistence does not come to be have either no knowledge at all outside the act of perceiving, or no knowledge of objects of which no impression persists; animals in which it does come into being have perception and can continue to retain the sense-impression in the soul: and when such persistence is frequently repeated a further distinction at once arises between those which out of the persistence of such sense-impressions develop a power of systematizing them and those which do not.

"So out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience; for a number of memories constitutes a single experience. From

experience again - i.e. from the universal now stabilized in its entirety within the soul, the one beside the many which is the single identity within them all - originate the skill of the craftsman, and the knowledge of the man of science, skill in the sphere of being.

Aristotle outlines the fundamental process of 'thinking' as being an inductive process by which 1) "sense-perceptions" leave impressions in the 'soul'; 2) the impressions which persist become "memories"; 3) the frequent repetition of memories of a particular phenomenon become systematized or chunked into a "single experience" or "universal"; 4) collections of these universals form the foundation for "skill" and "knowledge." Our basic mental capacities, then, come from our abilities to use our senses in order to perceive, and then to represent and remember what we have perceived.

While in NLP we would substitute the term 'nervous system' for the 'soul', much of what Aristotle describes mirrors the essential conceptualization of mental process in NLP. For instance, the "universal" which is made up of a number of memories - "*the one beside the many which is the single identity within them all*" - reflects the basic idea behind the concept of logical levels in NLP. Groups of behaviors form the basis for a capability; groups of capabilities form the basis for our belief and value systems; groups of beliefs and values form the basis for our sense of identity. All of these levels of perception, however, are founded on the micro level through sensory perception.

In *On The Soul*, Aristotle categorized the senses into the five basic classes of sight, hearing, touch, smell and taste. Aristotle's five senses correspond directly with the five 'representational systems' employed in the in NLP modeling process - Visual, Auditory, Kinesthetic, Olfactory and Gustatory. According to Aristotle, the five senses provided the psyche with information about qualities in the outside world that fell into a certain range:

"[T]he field of each sense is according to the accepted view determined as the range between a single pair of contraries, white and black for sight, acute and grave for hearing, bitter and sweet for taste; but in the field of what is tangible we find several such pairs, hot cold, dry moist, hard soft, etc. This problem finds a partial solution, when it is recalled that in the case of the other senses more than one pair of contraries are to be met with, e.g. in sound not only acute and grave but loud and soft, smooth and rough, etc.; there are similar contrasts in the field of color."

These "pairs of contraries" correspond to what in NLP are called the "sub-modalities." Sub-modalities are the particular perceptual qualities that may be registered by each of the five primary sensory modalities. Our visual modality, for instance, can perceive such qualities as color, brightness, shape, depth, etc.; our auditory modality is capable of registering volume, pitch, tempo, etc.; Our kinesthetic system perceives such qualities as pressure, temperature, texture, etc., and so on. Each sub-modality registers qualities that may range between two opposites: color<=>black-and-white, bright<=>dim, loud<=>quiet, high<=>low, hot<=>cold, heavy<=>light, etc.

For Aristotle, it was the relationship between these qualities that determined how we responded to the objects or situations we are experiencing.

"[W]hen an object of touch is equally hot and cold or hard and soft we cannot perceive; what we perceive must have a degree of the sensible quality lying beyond the neutral point. This implies that the sense itself is a 'mean' between any two opposite qualities which determine the field of that sense...it is indifferent what in each case the substance is; what alone matters is

what quality it has, i.e., in what ratio its constituents are combined."

Sensing, then, is noticing the relationship between these polarities - registering differences and ratios of difference. Aristotle implied that it was these "ratios" of perceptual qualities, not the objects themselves, that determined how we respond to something - i.e., it is the information about sensory qualities of things that are most important to our minds or 'psyches', not the things themselves. As Aristotle put it, "[I]t is not the stone which is present in the soul but its form." In other words, the 'form' is more important than the 'content' - our perceptual model of the world is more important than the objective reality of the world. And these 'sub-modality' qualities are the fundamental "formal cause" of our mental models of the world.

According to Aristotle it was the ratio between these polarities that determined what was pleasurable and what was painful, and thus what was to be approached or avoided and how much it was to be approached or avoided. If something was too much at either end of the polarity it became uncomfortable. There was a certain range of balance in which one experienced comfort. For example, a fire is, in and of itself, neither good nor bad, pleasurable nor painful. If one gets too close to the fire the ratio of hot-to-cold is too much on the hot side and it becomes uncomfortable. If one gets too far away from the fire, and it is cold weather, the ratio of hot-to-cold gets too much on the cold side and it also becomes uncomfortable.

Perception of pain and pleasure has to do with the ratio, the balance point of the senses. Thus, in Aristotle's view, we are constantly seeking to keep these ratios in balance. In other words, pain and pleasure are a communication about the degree of balance within the system.

A key consideration in modeling micro strategies with NLP relates to the functioning of the senses and their 'sub-

modalities' in a person's thinking process. These qualities have obvious significance in relationship to artistic processes such as painting and music where the dynamic balancing of qualities such as colors and tones are the essence of aesthetics. However, these qualities can have tremendous significance in other fields as well. Consider the impact of the ability to represent 'perspective' in regard to bringing about the European Renaissance. Further, it is not difficult to imagine that it would be a very different experience to try to conceptualize Einstein's theory of relativity by visualizing it in the form of flat, still, black and white mental images than to use three dimensional imagery that is moving and in color.

Aristotle also related these sensory qualities directly with the perception of pain and pleasure. Certainly, geniuses take pleasure in what they do. Their attraction to their work may come as a result of the cognitive micro structure with which they represent their particular subject matter. For instance, through NLP, these subtle perceptual qualities have been found to be at the basis of phenomena such as phobias, compulsions and addictions. Very effective techniques for treating these kind of problems have been developed that involve teaching a person to directly manipulate their internal experiences in order to adjust the 'ratios' of key qualities.

These qualities can even be shown to play a significant role in a person's ability to distinguish "imagination" from "reality" and "memory" from "fantasy."

The Role of Memory and Imagination

In addition to these sensory qualities, another fundamental element of the micro structure of "thinking" and "mental strategies" is the ability to recall and associate perceptions with other perceptions. In Aristotle's model of behavior, the 'psyche' used internal mental replications of sensory experiences to determine what to approach and avoid. Memory allowed an animal to consider a larger scope of experience that included things which were not able to be sensed in the

here and now. "Thoughts" operated more off of the impressions left by the senses than ongoing sensory input. These impressions took the form of "imagination" and "memory."

Aristotle believed that the mind was "*in its essential nature activity.*" Therefore, perception, and memory were the results of this 'activity' or 'movement'. As he maintained:

"The process of movement [sensory stimulation - RD] involved in the act of perception stamps in, as it were, a sort of impression of the percept, just as persons do who make an impression with a seal."

Aristotle also believed that, "*imagination must be a movement resulting from an actual exercise of the power of sense.*" As a result, it could also leave impressions in memory that could become associated together with those traces left by actual sensation. These associations of sensory impression were the basis for all thought.

To Aristotle, the process of "thinking" began when "impressions" became connected together through the 'law of association' which he described in his work ***On Memory***: According to Aristotle:

"Acts of recollection, as they occur in experience, are due to the fact that one movement has by nature another that succeeds it in regular order. If this order be necessary, whenever a subject experiences the former of two movements thus connected, it will invariably, experience the latter; if, however, the order be not necessary, but customary, only in the majority of cases will the subject experience the latter of the two movements."

"But it is a fact that there are some movements, by a single experience of which persons take the impress of custom more deeply than they do by experiencing

others many times; hence upon seeing some things but once we remember them better than others which we may have seen frequently. Whenever, therefore, we are recollecting, we are experiencing certain of the antecedent movements until finally we experience the one after which customarily comes that which we seek."

The process that Aristotle is defining here is similar to what is called "anchoring" in NLP. When two experiences occur together in a close enough time frame they can become linked or "anchored" together, so that one of the experiences will become a trigger for the other. As Aristotle mentions, an association may, and often does, take place in a single trial. When a series of sensory representations become associated with each other in a particular sequence it forms the basis of a cognitive "strategy."

Clearly, the ability to remember and form associations will be a fundamental influence on the phenomena of genius. For example, Mozart's phenomenal and practically instantaneous memory for music is often cited as both an 'attribute' and a 'cause' of his musical genius. One important question relating to the study of strategies of genius involves whether or not such capabilities are "innate" or "genetic" or can be developed.

In the NLP view it is believed that, while certain individuals may possess genetic proclivities, these abilities can be enhanced via particular skills and techniques. It is therefore relevant to explore, if possible, the micro processes by which geniuses facilitate their ability to remember and associate sensory experiences together. For instance, in the model of NLP, there are certain micro behavioral cues that are generally overlooked in the study of genius, which serve as 'accessing cues'. 'Accessing cues' serve to help people recall experiences and make associations. An accessing cue may range from idiosyncratic cues like snapping ones fingers,

mumbling "hmmm" or scratching one's head, to deeper and more universal cues like unconscious lateral eye movements and breathing patterns.

Observing and tracking these subtle cues can provide clues to how an individual is thinking, and can be used to help facilitate associative processes. For example, one of the most effective NLP strategies is the 'spelling strategy' in which an individual facilitates the process of visually representing and remembering a spelling word by moving his or her eyes up (and typically to the left) while learning or recalling a particular word.

In summary, Aristotle believed sensory input from the outside world would leave impressions which could become associated with one another, or with constructed impressions caused by an internal activation of the sensory system (i.e., imagination). These associations formed mental 'ideas' or replicas of sequences of sensory input and internally generated experience. Associations of present sensations to future consequences formed the basis of "calculations" and "deliberations." These associations in turn trigger the animal to move toward or away from objects in its surroundings. On another level, given an appropriate number and frequency of individual memories, a 'universal' perception would emerge from clusters of similar experiences as a principle which united the experiences together in a 'single experience'. As Aristotle states in *Posterior Analytics*:

"We conclude that these states of knowledge are neither innate in a determinate form, nor developed from other higher states of knowledge, but from sense-perception...for though the act of sense-perception is of the particular, its content is universal - is 'a man', for example, not the particular man Callias..."

"Thus it is clear that we must get to know the primary premises by induction; for the method by which even sense-perception implants the universal is inductive."

Common Sensibles

According to Aristotle the process of inductively identifying universals from particular sense-perceptions took place through the "common sense" - the place in the 'psyche' where all of the senses met. One of the functions of the "common sense" was to register something which repeated in a number of experiences - a pattern. Patterns or 'universals' were perceived in terms of a set of content-free qualities that Aristotle called the "common sensibles," which were the discriminations that were shared by all the senses.

"Common sensibles' are movement, rest, number, figure, magnitude, unity; these are not peculiar to any one sense but are common to all."

It is significant that Aristotle's "common sensibles" are not a function of any particular sensory modality. They are on a different level than the "pairs of contraries" or so called 'sub-modalities' in NLP, which are perceived by the individual senses (color, depth, shape, etc., for vision; tone, tempo, pitch, etc., for hearing; and temperature, pressure, texture, etc., for feeling).³ The "common sensibles" identified relationships between the perceptions and impressions left by the senses.

For example, 'intensity' is something you can register in any sense. You can have intensity of color, sound, taste, smell or touch. The same with 'number'; you can see three things, hear three things, feel three things, etc. Location and movement are also perceptible via all the senses. You can see, hear, feel or smell that something coming from a particular location or moving in a particular direction. These qualities

³ In fact, Aristotle's concept of the "common sensibles" points at some important new directions for NLP research and analysis in the future.

are not a function of only one sense. They are something that can be shared by all the senses and facilitate the transfer of information between the senses. According to Aristotle, common sensibles allowed us to do our higher level mental processing.

For example, Bower (1985) - the researcher who conducted the learning experiments with babies cited earlier - determined that children have to solve quite complex conceptual problems from an early age. These problems involved issues such as: Is a stopped object the same as a moving object? Can a toy move and be transformed into something else at the same time? Can an object go inside, on top of, behind another object, and then reappear unchanged? To solve these problems, which the infant rapidly does, it is not preoccupied with the specific sensory qualities of objects - i.e. colors, textures, shapes and smells. According to Bower:

"The more intangible properties of the object - movement, place or position - are far more important in the child's thinking. These 'formal' (rather than sensory) properties of stimulation were the kind of features which could be presented and interpreted by several senses. Consider, for example, the movement of the mother's breast to the infant. Movement might be sensed through smell or touch. Symmetry is another example of a formal property of stimulation. If straight ahead, a sound source produces exactly the same stimulation in each ear. If it is to the right, the right ear is stimulated earlier and more intensely than the left ear, and if to the left the opposite happens. Symmetry works equally well for detecting smells, vibration or something visual.

"Like movement and position, symmetry of stimulation is independent of any sense - it is a formal property of stimulation. I thought maybe the child's perceptual

world was keyed to perceive these formal properties rather than respond to specific details."

Bower's "formal properties of stimulation" are what Aristotle called the "common sensibles." Bower began to wonder if he could use these formal properties to help transfer information from one sense to another in order to help sensorially impaired children such as those who were born blind. He reports:

"Training infants to transfer perceptual information from sense to sense seemed almost impossible. What we needed was a device which could change formal properties that would normally be easily seen - symmetry, movement, place - into sounds. Once this was done the device could be used on sighted children in the dark, or blind children to find out if they could 'see' through sound."

Bower and his colleagues eventually came up with a device called the 'sonic guide'. It was worn as a headband by the child, and gave an ultrasonic pulse. The pitch of the audible signal indicated the distance of the objects from which the echo came. High pitch meant distant objects; low pitch near ones. The amplitude of the signal coded for the size of the irradiated object (loud=large, quiet=small). The texture of the object was given by the clarity of the signal. When he first began applying the device, Bower was expecting slow, gradual learning to be necessary. So he was astounded by the results of the first session.

The child was a sixteen-week-old congenitally blind infant. A silent object was moved slowly to and from the infant's face. In the fourth presentation his eyes started to converge as the object approached, and diverge as the object moved away. In the seventh presentation he used his hand to reach out for the object. Then they tested him on objects moving to

the right and the left. He tracked them with his head and eyes, and swiped at the objects.

Bower subsequently used the sonic guide on several congenitally blind infants of which the most remarkable was a young girl who started using the guide when she was about seven months. At that stage she was learning to crawl, but she was frightened of moving very far. After several sessions with the guide she became much freer. At two years old, she was walking up and down stairs, which is challenging enough for a normal sighted child. The guide gave her a very complicated signal from the stairs, but she actually seemed to like the complex input and loved running up and down the stairs. When the guide was removed she learned to stamp her own feet - sending out sound waves to get echoes back in order to orient herself.

Interestingly, when Bower tried the guide on older children he found they couldn't benefit as much from the signals. It appeared that once a child has learned that sound is a (property of *objects*), that child seemed to lose the ability to use it as a medium for perceiving the more abstract qualities necessary to transfer information between the senses.

After many experiments with the sonic guide, Bower reached the conclusion that a newborn child is most sensitive to the formal properties of stimulation or 'common sensibles' - such as symmetry, movement and position - and that these formal properties can indeed be transferred from sense to sense - visual information transferred to sound and so on. Initially, it seems the senses are not so specialized as to focus on sensory details associated only with specific senses. During perceptual development the senses become 'educated' by experience and begin to focus more on 'objects' and 'things', losing some of their sensitivity to common sensibles. According to Bower:

"Our adult perceptual world is very sensory, full of colors, smells, sounds, and so on. But the newborn's

world is not sensory, it is 'perceptual'. The child picks up the formal characteristics associated with sensory experience, without picking up the sensory experiences themselves...I think children are responding to forms of stimulation, and the sense which gives the best form is the sense they will specialize in."

The ability to communicate from one sense to another appears to be a basic property of genius. For example, Mozart's musical genius didn't come simply from his ability to recognize and play specific notes and manipulate qualities of sound such as tempo, volume and tone. His gift involved perceiving and representing deep patterns, relationships and "universals" through sound. When we examine his process later in this book, we will find that Mozart had a remarkable ability to link sounds with all of the other senses. For Mozart, music involved emotions, the mind's eye and even the sense of taste as much as it did his ears. Mozart's description of his strategy for composition suggests that music was a kind of multi-sensory mental 'sonic guide' in which feelings, imagery and even taste blended together. Perhaps, unlike most adults, Mozart and other geniuses retained their direct access to the 'common sensibles' and their ability to share information easily between the senses and to perceive 'forms' rather than 'things'.

According to Bower, we lose access to the common sensibles because we learn to associate sensory qualities with 'things' as opposed to their 'formal characteristics' and relationships. We even tend to 'objectify' the sensory qualities themselves, perceiving colors, smells and sounds as 'things' rather than ratios between "pairs of contraries" as Aristotle suggested. (Even many NLP techniques treat 'sub-modalities' as if they are a checklist of 'things' rather than ratios.) For instance, we talk about an internal image being "bright" or "distant" as if it were a 'thing' associated with a particular image. To determine if an image is 'bright' it is necessary to first

determine, "Bright compared to what?" An image is neither inherently 'bright' nor 'dim', 'colorful' nor 'dull', 'distant' nor 'close'; it is "distant, colorful or bright compared to something else" - such as its background or another image.

An enlightening experiment was done by gestalt psychologists with a group of dogs. The dogs were trained to approach something when shown a 'white' square and avoid it when shown a 'gray' square. When the dogs had learned this particular discrimination task successfully, the experimenters switched to using the 'gray' square in contrast to a 'black' square. The dogs immediately shifted to approaching the object in response to the 'gray' square (which had previously triggered avoidance), and avoiding the object when shown the black square (which had not been 'conditioned' to anything). Presumably, rather than perceive the 'gray' and an absolute stimulus, the dogs were responding to the deeper ratio 'lighter versus darker' as opposed to 'gray', 'white' or 'black' as being 'things'.

Bower suggests that we lose the sensitivity to deeper relationships and 'formal characteristics' as we become 'educated' to focus on the 'particulars' of experience as opposed to the 'universals'. The process of 'objectifying' a group of sensory qualities is related to what Aristotle called the "incidental objects of sense." "Incidental objects of sense" resulted from combining the information provided by different senses to perceive 'things' which were made up of clusters of sensory qualities. In *On The Soul* Aristotle explains:

"We speak of an incidental object of sense where e.g. the white object which we see is the son of Diaries; here because 'being the son of Diaries' is incidental to the directly visible white patch...perceived or seen by us...The senses perceive each other's special objects incidentally...because all form a unity: this incidental perception takes place whenever sense is directed at one and the same moment to two disparate qualities in

one and the same object, e.g. to the bitterness and yellowness of bile, and the assertion of the identity of both cannot be the act of either of the senses; hence the illusion of sense, e.g. the belief that if a thing is yellow it is bile."

"Incidental objects of sense" are a kind of fundamental 'sensory syllogism' through which individuals build maps of the world from their sensory experiences. For example, "If something is yellow and bitter then it is bile," or "If an object is small, yellow, moves quickly and emits a high pitched tone then it is a canary," etc. In a way, this process has to do with very basic 'formal causes' related to our perception. According to Aristotle, the 'common sense' associated qualities from different senses together form what we might call 'beliefs' or 'maps' of 'reality'. And that it was from these deep 'syllogisms' that Aristotle felt we built our models of the world.

Yet while this process allows us to organize, make sense of and bring coherency to our experiences, it is also the source of the "illusion of sense" or, as Bower implies, an 'objectification' of sense that begins to narrow and limit our awareness and use of the deeper 'formal characteristics' of sense or 'common sensibles'. In NLP terms, we begin to confuse the 'map' and the 'territory' and lose access to possible choices.

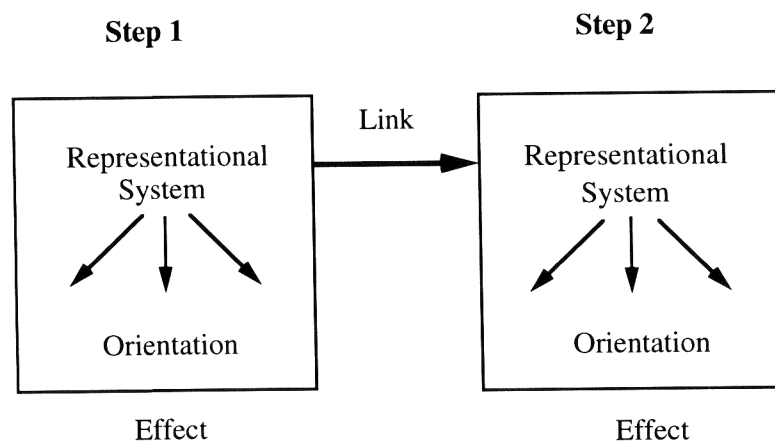
Bower's comment that "the sense which gives the best form is the sense they will specialize in" points to the concept of the 'most highly valued representational system' in NLP. Originally described by William James (1879), the notion of a person "specializing" in or "highly valuing" a particular sensory modality relates to the fact that different people tend to rely on certain sensory modalities more so than others. According to James, "*In some individuals the habitual 'thought-stuff,' if one may so call it, is visual; in others it is auditory, articulatory, or motor: in most, perhaps, it is evenly mixed.*" A more 'visually oriented' person, for instance, will tend to depend heavily on his or her sense of sight to learn,

organize or plan, etc. If an individual has specialized to a very high degree, he or she may even experience difficulties learning or managing tasks that involve an emphasis on other senses. A highly 'visual' person, for instance, may excel in mathematics or drawing, but may experience difficulties with music or athletics. Individuals who are highly 'auditorally oriented' may have exceptional verbal skills but lack visually oriented skills, such as the mental spatial manipulation of objects, or their 'kinesthetic' abilities, such as physical coordination. Similarly, people who have highly specialized in touch or 'feeling' may learn manual skills easily but experience difficulties in academic subjects (which are more visual and verbal).

One of the key issues in micro modeling relates to how individuals use their senses and whether they have specialized with respect to particular senses.

Modeling Micro Strategies - The R.O.L.E. Model

The R.O.L.E. model (Dilts, 1987, 1991, 1993) is a micro modeling structure in NLP which summarizes and incorporates Aristotle's basic distinctions relating to the mind or 'psyche'. **R.O.L.E.** stands for **R**epresentational **S**ystem-**O**rientation-**L**ink-**E**ffect. It may be used to define the micro level cognitive structure of a particular T.O.T.E. Each step in the T.O.T.E. involves the representation of some information which will be oriented to a certain part of the problem space and linked to other representations. The way in which information is represented, oriented and linked will produce a particular effect in terms of the overall process.



Basic Distinctions of the R.O.L.E. Model

In a spell checking program, as an analogy, the computer may be oriented to check a whole document or only selected portions of a document. Correct spellings may be represented by either a list of correct spellings or rules governing correct spellings. The way in which these various elements are

defined and then linked together will determine the efficiency and accuracy of the program.

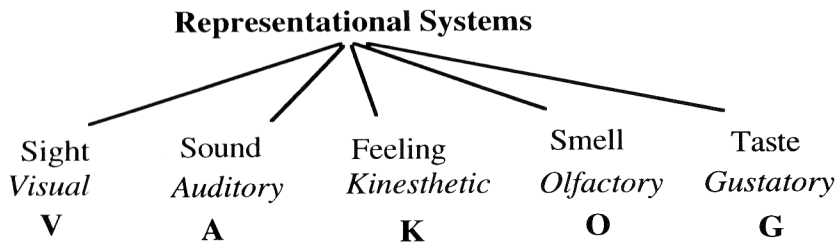
In the making of a meal, an analogy may be made between a specific recipe and the R.O.L.E. model elements. A recipe describes which ingredients are to be used, whether they should be fresh, marinated, preheated, etc., what they should be mixed or 'linked' with, and what kinds of effects should be produced at each step in the recipe. As another example, the opening passage of Genesis, implies that the way God represents his goals - i.e., "God *said*, 'Let there be...'" - is different than the representational system he uses to evaluate what he has created - i.e., "And God *saw* that it was good". In terms of the R.O.L.E. model it could be said that in God's 'micro strategy' for creation, words are linked to actions, the results of which are then visually inspected to determine whether they are complete.

Thus, the goal of the R.O.L.E. modeling process is to identify the essential elements of thinking and behavior used to produce a particular response or outcome. This involves identifying the critical steps of the mental strategy and the role each step plays in the overall neurological "program." This role is determined by the four factors which are indicated by the letters which make up the name of the **R.O.L.E.** Model.

1. **Representational Systems** have to do with which of the five senses are most dominant for the particular mental step in the strategy: **V**isual (sight), **A**uditory (sound), **K**inesthetic (feeling), **O**lfactory (smell), **G**ustatory (taste)⁴. As we have established, each representational system is designed

⁴ In the NLP model, the various representational systems are often annotated as simply V, A, K, O or G for Visual, Auditory, Kinesthetic, Olfactory and Gustatory. Language and pure sound is distinguished by the subscripts A_d for words versus A_t for music and other non-verbal sound. The "d" stands for "digital" (separate discreet chunks) and the "t" indicates "tonal."

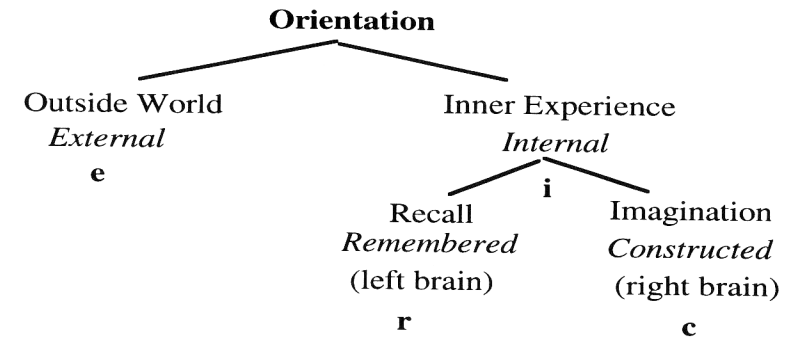
to perceive certain basic qualities of the experiences it senses. These include characteristics such as *color, brightness, tone, loudness, temperature, pressure*, etc. As we have mentioned earlier, these qualities are called “sub-modalities” in NLP since they are subcomponents of each of the representational systems.



For example, if we were to consider the micro cognitive elements of the thinking strategy of a particular genius such as Leonardo or Einstein, the question would be, “When they think about a particular topic, which representational system do they use?” Through which of the senses did Einstein formulate his theory of relativity? Did it just come to him in words or as a completed mathematical formula? Were images or feelings involved? How did Leonardo conceive his machines? If he visualized them, were they in color? What role did the perspective or movement of the image play in his creative process? These are the types of question to be answered with respect to the “R” of the R.O.L.E. model: Which senses are involved, which sensory qualities were emphasized and to what degree were they relevant and necessary?

2. **Orientation** has to do with whether a particular sensory representation is focused (e)xternally toward the outside world or (i)nternally toward either (r)emembered or

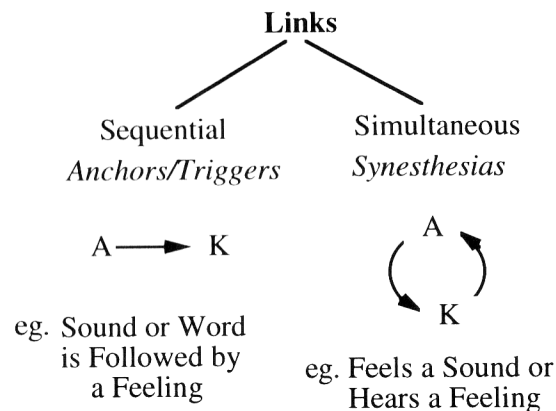
(c)onstructed experiences.⁵ For instance, one may “see” something in the outside world, in memory or in one’s imagination.



The habitual orientation of a representational system will influence a person’s cognitive performance and that person’s areas of strength. An individual who primarily orients his or her senses internally might be strong in theoretical processes. A person who is more externally oriented will most likely be a good observer. For instance, inventor Thomas Edison’s comment that “Invention is 1% inspiration and 99% perspiration,” implies an emphasis on the external orientation of his strategy in the form of observation and experimentation. Theoretical physicist Albert Einstein, on the other hand, tended to be more internally oriented and emphasized ‘thought experiments’ claiming, “Imagination is more important than knowledge.” Mozart was able to orient his auditory representational system in all areas with equal ease, demonstrating exceptional abilities to perform (A^e), recall (A^r) and compose (A^c) music.

⁵ In NLP shorthand, orientation is noted as a superscript to the letter indicating the particular sensory modality being used. For instance, V^r would indicate remembered visual imagery, K^e would indicate internal tactile ‘kinesthetic’ sensations, A_iⁱ would indicate internal dialog or ‘self talk’, etc.

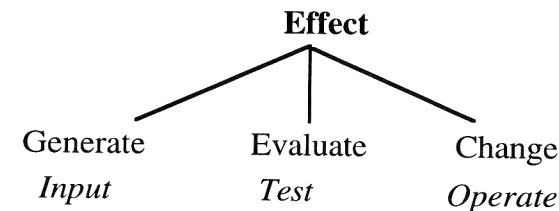
there are simultaneous links, which qualities of one sense are linked to which qualities of the other sense?



Clearly, the linkages between the senses are an important aspect of the cognitive processes underlying genius. The source of Disney's animated masterpiece *Fantasia* is the linking or 'synesthesia' between music and constructed visual imagery. Da Vinci's notebooks involve the continual movement between pictures and words. And, as he personally claimed, Aristotle's process of induction involved the linking of multiple sensory perceptions in the 'common sense'.

4. **Effect** has to do with the result or purpose of each particular step in the thought process. Effects relate to the role of a particular cognitive micro process with respect to the macro strategy or T.O.T.E. in which that micro strategy is functioning. For instance, the function of the step could be to a) generate or input a sensory representation, b) test or evaluate a particular state with respect to some criterion or c) operate to change some part of an experience or behavior. That is, depending on its orientation and type of link, a feeling could be a) information about what is happening in one's environment (that an object is hot or cold, for example),

b) part of a judgment or evaluation about one's environment (such as feeling that one likes or dislikes something) or c) an attempt to change or adjust one's behavior (like an athlete recalling a feeling of excitement in order to 'get up' for a contest).



The effect a particular representation produces in a micro strategy is a significant element of genius. In NLP there is a distinction made between an individual's most highly *developed*, most *highly valued* and most *conscious* representational system. This distinction reflects the typical effect of a particular representational system. If an individual, like Einstein for example, used visual images, feelings and words in his micro strategy, we will want to sort out the effect of each representational system in the strategy. Were images used to gather information, make conclusions or to conceptualize possible imaginary scenarios? Was the function of feelings to provide information or draw conclusions? Was the role of language to input ideas, apply rules or run calculations?

A person's most highly 'developed' system is the sense with which that person is able to make the greatest number of distinctions. A person's most highly 'valued' representational system is the one that person tends to use to evaluate the meaning of an experience and make decisions. A person's most 'conscious' system is the one in which that person has the most intentional ability to change and utilize. If someone has specialized strongly in the visual modality then the most

highly developed, highly valued and conscious representational system may all be visual. Some people may have developed one of their senses to a high degree, but not value it as much as another one of their senses. For example, some people may highly value their feelings, but not be very aware of feelings or able to control them. Some people have a highly developed ability to visualize, but are not conscious of making visual images. A key issue in modeling the strategies of geniuses involves determining the degree to which the various senses are developed, valued and consciously utilized.

Language as a Tool of Thinking and Modeling

One way to determine the influence of a particular representational system in an individual's micro strategy is to examine how it is reflected in a person's language patterns. Language is clearly an important indicator of a person's internal cognitive processes. In his book *On Interpretation* Aristotle maintains:

"Spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images."

Aristotle's claim that words "symbolize" our "mental experience" echoes the NLP notion that written and spoken words are 'surface structures' which are transformations of mental 'deep structures'. As a result, words can both reflect and shape mental experiences. This makes them a powerful tool for thought. Because, as Aristotle points out, the "mental experiences" symbolized by the words are similar for different people, words are also a useful tool for modeling. By looking for the deep structure beyond the specific words used by an individual, we can identify the process level of the mental operations encoded within that person's language patterns. Similar mental processes may then be communicated and developed in other people through language and other 'surface structures'.

This requires that we consider the formal properties of language as much as its content; since a strategy is more about the form of a person's thinking process than the content. In examining the formal properties of language

Aristotle distinguished between the relative role of nouns and verbs.

“By a noun we mean a sound significant by convention, which has no reference to time, and of which no part is significant apart from the rest...Thus in the word ‘pirate-boat’ the word ‘boat’ has no meaning except as part of the whole word. The limitation ‘by convention’ was introduced because nothing is by nature a noun or name - it is only so when it becomes a symbol; inarticulate sounds, such as those which brutes produce, are significant, yet none of these constitutes a noun.”

“A verb is that which, in addition to its proper meaning, carries with it the notion of time. No part of it has any independent meaning, and it is a sign of something said of something else...‘Health’ is a noun, but ‘is healthy’ is a verb; for besides its proper meaning it indicates the present existence of the state in question.”

According to Aristotle, words are sounds that become symbols of mental experiences through the process of association. Nouns are sounds that become associated with our perceptions of ‘things’ (the “incidental objects of sense”). Verbs are sounds associated with our perceptions of the attributes of, or relationships between things (submodalities and “common sensibles”) as they unfold with respect to time. Nouns are more related to the content of our experiences, while verbs symbolize characteristics and processes.

In the model of NLP, certain key verbs, or ‘predicates’, provide a strong indication of how a person is thinking. Words such as “see,” “clearly,” “show,” “image,” for instance, are indicative of visual processes. Words like “says,” “sounds,” “heard,” “rings a bell,” “tell,” etc. indicate auditory or verbal experiences. Language patterns such as “feel,” “rough,” “be in touch with,” “painful,” “cold,” etc. imply kinesthetic processes, and so on.

Modeling the Micro Structure of Aristotle’s Thinking Strategy

By filtering for these types of words in a person’s language, we can uncover important information about that individual’s mental processes and strategies. For example, consider the following statement by Aristotle:

*“(1) No one can learn or understand anything in the absence of sense, and (2) when the mind is actively aware of anything it is necessarily aware of it along with an **image**...To the thinking soul **images** serve as if they were contents of perception...just as if it were **seeing**, it calculates and deliberates what is to come by reference to what is present; and when it makes a **pronouncement**, as in the case of sensation it **pronounces** the object to be **pleasant** or **painful**, in this case it **avoids** or **pursues**.”*

In the NLP view, Aristotle’s description of the general functioning of “the mind” is probably a projection of his own general mental strategy. Judging by his choice of words, it would seem that this strategy has a particular sequence which begins with the association of external sensory input to internal visual representations (**Vⁱ**). The mind then “calculates and deliberates” by “seeing” or constructing mental “images” (**V^c**) of “what is to come by reference to what is present” (most likely through internal patterns of association). These images are evaluated via a verbal process. The mind makes a “pronouncement” (**A_dⁱ**) from which physical actions are initiated. The “pronouncement” is most likely derived through the process of applying some kind of syllogism.

Aristotle’s language patterns imply that, for him, the visual representational system is both conscious and highly

developed. The abilities to “calculate” and “deliberate what is to come by reference to what is present” just as if one “were seeing” presupposes that one is consciously aware of one’s internal imagery, is able to perceive distinctions and relationships between images and can manipulate those images to a certain degree. Aristotle’s statement that the mind makes a “pronouncement” about an experience would imply that the output of the verbal representational system is most highly valued. That is, while mental images provide the input and operations for the mental strategy, language evaluates these visual contents and provides the basis for behavioral action. Of course, Aristotle’s description that the object is determined to be “pleasant or painful” implies some kind of internal feeling response (**K**ⁱ), but his language does not make it clear whether or not the pain or pleasure are directly experienced.

In another statement, however, Aristotle indicates that the experience of internal feelings does indeed play an important role in this overall strategy in the form that he called “appetites” and “desires.” Appetites and desires were feelings formed relative to some goal or end - which was provided for them by the contents of ongoing perception, memory or imagination.

“[M]ind is never found producing movement without appetite...but appetite can originate movement contrary to calculation...[I]t is the object of appetite which originates movement, this object may be either the real or the apparent good...”

“[A]ppetites run counter to one another, which happens when a principle of reason and desire are contrary and is possible only in beings with a sense of time (for while mind bids us hold back because of what is future, desire is influenced by what is just at hand: a pleasant object which is just at hand presents itself as both pleasant and good, without condition in either

case, because want of foresight into what is farther away in time).”

The implication is that “appetites” are internal feeling states which operate on what Freud called the ‘pleasure principle’ - the pursuance of pleasure and avoidance of pain. These feeling reactions may be brought about by either ongoing experiences or through mental calculations. Ongoing experiences can create a feeling of “pleasantness” or “unpleasantness” - presumably via the ratios between the “pairs of contraries” (or ‘sub-modalities’) which make up their sensory qualities. The “goodness” of an object, on the other hand, seems to come as the result of ‘calculations’ (projections of future consequences).

Aristotle maintains that conflicts between feelings are created by the perception of time because principles of “reason” and “desire” can potentially operate in different time frames. “Reason” tends to be more associated with the perception of the future and “desire” with the present. We also tend to associate “reason” and the process of “reasoning” with verbal analysis. Aristotle implies that the experience of “what is future” can produce a perception of something as “good,” but what is “just at hand” can be “both pleasant and good.” Problems arise when one is torn between “what is future” and what is “just at hand” or “because of a want of foresight into what is farther away in time.”

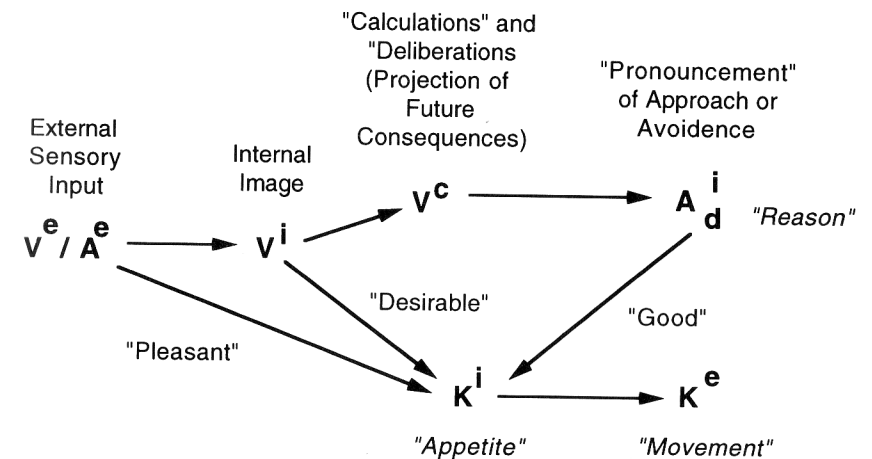
Synthesizing Aristotle’s comments together as a reflection of his own internal mental processes and considering them in the light of his other comments about the ‘psyche’ and his own analytical process, we can begin to form a picture representing the cognitive micro structure of his thinking strategy:

1. Sensory experience serves as both the input (“no one can learn or understand anything in the absence of sense”) and ultimate confirmation of internal mental processes

(credit must be given to observation rather than to theories, and to theories only insofar as they are confirmed by the observed facts.”).

2. As input, sensory experience has two influences:
 - a) the ratios of the ‘submodalities’ associated with the sensory experience produce an immediate sensation (*“the sense itself is a ‘mean’ between any two opposite qualities which determine the field of that sense”*) which may be perceived as either pleasurable or painful;
 - b) the sensory experience becomes associated with an internal “image” or representation related to the external input (*“out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience; for a number of memories constitutes a single experience”*) - such as an “incidental object of sense”. This “image” or map can produce a sense of “desirability” through ratios of internal submodality qualities.
3. Calculations and deliberations are made through a train of cause and effect associations connecting the present experience to projections of perceived future consequences (*just as if [the mind] were seeing, it calculates and deliberates what is to come by reference to what is present*).
4. Some kind of verbal evaluation is made about the future consequences (most likely in the “if-then” format of the syllogism) which “pronounces” something “good” and approachable or as something to be avoided (*“it pronounces the object to be pleasant or painful, in this case it avoids or pursues”*).
5. The three influences from the present (immediate sensation), past (the “image” derived from memories)

and the future (calculations of consequences) converge on the internal feelings associated with “Appetite.” If the three evaluations (pleasure, desire & goodness) overlap, the choice of external behavioral action is obvious; if not, a conflict ensues in which presumably the stronger of the three prevails.



Cognitive Micro Structure of Aristotle's General Thinking Strategy

While it seems clear that Aristotle's strategies were responsible for producing some of the greatest advances in human thought (both in his own time and in later ages), modern society and education have tended to focus more on the discoveries resulting from these strategies than on the mental processes through which those discoveries were made. In the next section we will explore some of the ways we can apply Aristotle's micro, macro and meta strategies to make our own discoveries.

Applications of Aristotle's Strategies

The objective of the NLP modeling process is not to end up with the one 'right' or 'true' description of a particular person's thinking process, but rather to make an instrumental map that allows us to apply the strategies that we have modeled in some useful way. An 'instrumental map' is one that allows us to act more effectively - the 'accuracy' or 'reality' of the map is less important than its 'usefulness'. A metaphorical map (such as the 'thought experiments of Albert Einstein), for instance, may have as much instrumental value as a 'realistic' map.

"*Instrumental perfection*" (Thompson, 1967) is achieved when a particular system of action corresponds tightly with the cognitive system used to describe it. The basic criterion for "instrumental perfection" is the degree of "closure" between the cognitive and behavioral systems - i.e., the congruence between the distinctions and relationships in the cognitive system and the behavioral operations and interactions for which they stand. The degree of "closure" is determined by the extent to which the variables in the cognitive map or logical system allow us to identify and mobilize empirical operations and resources that lead to effective and appropriate actions in the behavioral system.

Thus, the instrumental application of the micro, macro and meta strategies that we have modeled from a particular individual involves putting them into structures that allow us to use them for some practical purpose. This purpose may be similar to or different from that of the model which initially used them.

One way to think about practically applying the information modeled from an individual's mental strategies is that it may be implemented with respect to different parts of the T.O.T.E. That is, we may identify and apply a person's *goals*

only; using other operations to achieve those goals and other evidence procedures to assess progress towards the goals. Or, we may model the *operations* of an individual and apply those operations to achieve different goals than those for which they were originally intended. We may also choose to identify and use only the *evidences* or *evidence procedures* used by the model, applying them to different goals and with different operations than those for which they were originally developed.

Thus, we may use all or only parts of the information we have modeled from a particular genius. In Aristotle's case, for example, we can apply the strategies we have modeled by:

- a) Exploring topics and areas that he did not himself consider or that were unavailable in his lifetime (such as using them as guidelines for our own study of genius),
- b) Combining elements of his strategies with other methods and approaches in order to enhance and enrich them, or
- c) Using them as the inspiration for building a completely new approach to thinking about something.

The following applications demonstrate how we can use the information we have gathered from our modeling of Aristotle's strategies in several different ways.

The S.C.O.R.E. Model: Implementing Aristotle's Strategies for Defining 'Problem Space'

One simple but powerful way to apply Aristotle's strategies for identifying 'problem space' is to matrix them with the S.C.O.R.E. model in NLP. The S.C.O.R.E. model (Dilts & Epstein, 1987, 1991) is essentially a problem solving model that identifies the primary components necessary for effectively organizing information about the problem space related to a particular goal or process of change. The letters stand for *Symptoms*, *Causes*, *Outcome*, *Resources*, and *Effects*. These elements represent the minimum amount of information that needs to be gathered to effectively address that problem space.

1. **Symptoms** are typically the most noticeable and conscious aspects of the presenting problem or present state. Defining symptoms involves identifying 'constraining causes' - i.e., the ongoing relationships, presuppositions and boundary conditions (or lack of boundaries) within a system which maintain the present or 'symptomatic' state.
2. **Causes** are the underlying elements responsible for creating and maintaining the symptoms. They are usually less obvious than the symptoms they produce. Defining causes involves identifying the 'antecedent' or 'precipitating causes' for those symptoms - i.e., past events, actions or decisions that influence the present or 'symptomatic' state through a linear chain of 'action and reaction'.
3. **Outcomes** are the particular goals or desired states that would take the place of the symptoms. Defining

outcomes involves identifying 'formal causes' - i.e., determining the fundamental form of the outcome and how specifically will one know when one has reached it. Defining outcomes is an important part of establishing the problem space in that it is the gap between the present and desired states that determines the scope of the problem.

4. **Resources** are the underlying elements responsible for removing the causes of the symptoms and for manifesting and maintaining the desired outcomes. In a sense, defining resources involves finding the 'middles' relating to reaching the desired outcomes and transforming the causes of the symptoms.
5. **Effects** are the longer term results of achieving a particular outcome. Positive effects are typically the reason or motivation for wanting the outcome to begin with (projected negative effects can create resistance or ecological problems). Specific outcomes are generally stepping stones to get to a longer term effect. Defining effects involves identifying 'final causes' - i.e., future objectives, goals or ends which guide or influence the system giving current actions meaning, relevance or purpose.

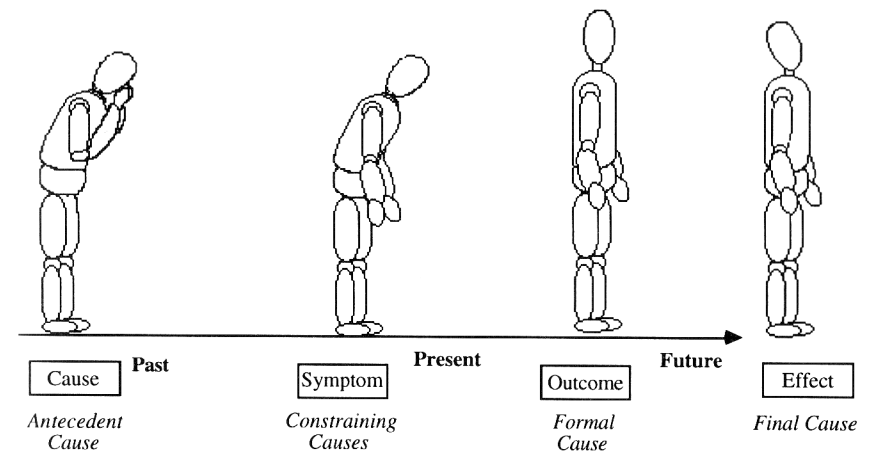
As an example, let's say a person is experiencing anxiety in certain public speaking contexts. Exploring the *symptom* would involve identifying the behavioral and environmental conditions and constraints that accompany the anxiety. For instance, is there a particular size of group, type of group or topic that produces the anxiety? Does it relate to constraints such as time limits or restricted space? Is the person constrained by his or her posture, breathing pattern or pattern of movement? Is the person constrained by his or her 'psyche'? What sort of internal feelings, mental imagery and self talk accompany the anxiety?

Exploring the *causes* of the symptom would involve focusing on the antecedent causes of the anxiety. Has the person always experienced anxiety in these contexts? When did the anxiety first start? Is the anxiety related to particular associations or 'anchors' such as certain beliefs or memories (i.e., past humiliations or failures)? How are those beliefs or memories represented? As feelings? images? words? smells? What are the ratios of submodality qualities associated with those beliefs or memories that make them seem unpleasant or painful? If there are images, are they moving or still? Colorful or black and white? Dim or bright? If there are words, are they loud or quiet? High pitched or low pitched? Rhythmic or monotoned? If there are feelings, are they warm or cool? Hard or soft? Heavy or light? Which 'common sensibles' are most relevant? Where are the images, sounds, feelings, smells, etc. located? In front of the person? Behind the person? Above? Below? Is there movement? Is the person experiencing the memories 'in time' or 'through time'?

Exploring the *outcome* would involve clearly and solidly establishing the fundamental form of the desired state that would take the place of the anxiety in the problematic public speaking contexts. How does the person want to respond instead of experiencing anxiety? How would the person know he or she was *not* anxious? How would the person act differently in terms of his or her posture, breathing pattern or pattern of movement? How would the person's internal feelings, mental imagery and self talk change? As I mentioned earlier, the form of the outcome will establish the scope and level of the problem. That is, if the person's outcome is to simply be more comfortable when speaking, then the scope of the problem will probably stay focused on the level of capabilities and behaviors. If the person's outcome is to be a trainer or politician, the problem space will also likely involve issues related to beliefs and identify.

Exploring the desired *effects* would involve identifying the longer term purposes and positive results of effective public

speaking. What are the positive effects, benefits and 'payoffs' of competent public speaking? What other capabilities, activities and projects does effective public speaking open up? What core values and beliefs does it fulfill? How will the person be able to be more of who he or she truly is through effective public speaking? Who else, that the person is close to, would be positively affected by the person's public speaking ability? What feelings of satisfaction, confidence and contribution will the longer term results of effective public speaking include? Can the person represent those positive beliefs, values and projections as feelings? Images? Words? Which submodality qualities would make those effects seem even more desirable?



Placing The S.C.O.R.E. Elements of a Problem Space on a Time Line

One way to organize information relating to the S.C.O.R.E. model is to put it on a time line such that the antecedent cause is farthest back on the time line to a location representing the time frame in which the symptom started. The

present state or symptom can be placed in a location representing the present or ongoing time frame. The desired outcome would be positioned slightly beyond the present to a location representing the time frame in the future in which the outcome is to be achieved. And the effect would be placed somewhere just beyond the outcome. This may be done mentally, on paper or, as the diagram suggests, by using physical locations. One advantage of using physical locations is that they help to more easily and clearly sort out the different causes and keep them separate. It also makes it possible to tangibly and experientially explore the physiological pattern (such as posture, breathing, movement, etc.) associated with each element.

Placing the elements on a time line also makes it easier to see potential conflicts and issues related to time and the perception of what is "just at hand" and what is "future." For instance, in the example of anxiety related to public speaking that we have been exploring, there is a kind of dilemma between that which is "just at hand" and is perceived as "unpleasant" or "painful" (speaking in front of a group), and something in the "future" that is considered desirable or "good" (the positive effects of public speaking). Often in such cases, something in the environment triggers an internal "image" related to several unpleasant experiences in the past (*"for a number of memories constitutes a single experience"*). Given that the mind "calculates and deliberates what is to come by reference to what is present" anxiety is produced due to the projection of the recurrence of the past problems.

If there is no representation of the desired outcome or effects, the person would probably avoid public speaking. If there is a representation of a desired future outcome and/or effect a conflict ensues between what is perceived as unpleasant in the present and what is "pronounced" desirable and good in the future. The resolution comes when the appropriate resources are found that adequately address the problem space by reducing or transforming the sense of unpleasant-

ness related to the present and enriching or intensifying the desirability of the future 'good'.

Exploring resources would involve identifying areas of 'solution space'. Solution space is a function of mobilizable capabilities and operations which have not yet been applied to the problem situation that would a) reduce or transform the constraining and antecedent causes or their degree of influence, and b) support reaching the outcome and desired effects.

Resources relating to the achievement of the outcome and effects may be discovered or developed using Aristotle's strategy of 'induction'. In what situations that could be anxiety producing, besides public speaking, is the person able to achieve his or her desired outcome? In what other situations has the person been able to transform anxiety into confidence? What do those situations have in common? What do these resourceful situations share in terms of the person's posture, breathing pattern or pattern of movement? What themes in terms of the person's beliefs, internal feelings, mental imagery and self talk are held in common?

Resources relating to constraining and antecedent causes may be discovered by applying Aristotle's principles of 'conversion' to seek counter examples. For example, once we think we have identified the antecedent and constraining causes associated with the symptom we can identify potential resources by identifying the counter examples and exceptions to the rules that point to which other attributes and operations influence those cause-effect relationships. If the anxiety is associated with a particular size of group, for instance, we can ask whether there has ever been a time when the person spoke in front of a group this size and was *not* anxious? What was the difference? If this was a group of friends/children/animals would the person still feel anxious? What makes the difference? What changes of posture, breathing pattern or pattern of movement would make it difficult for the person to maintain the feeling of anxiety even in front

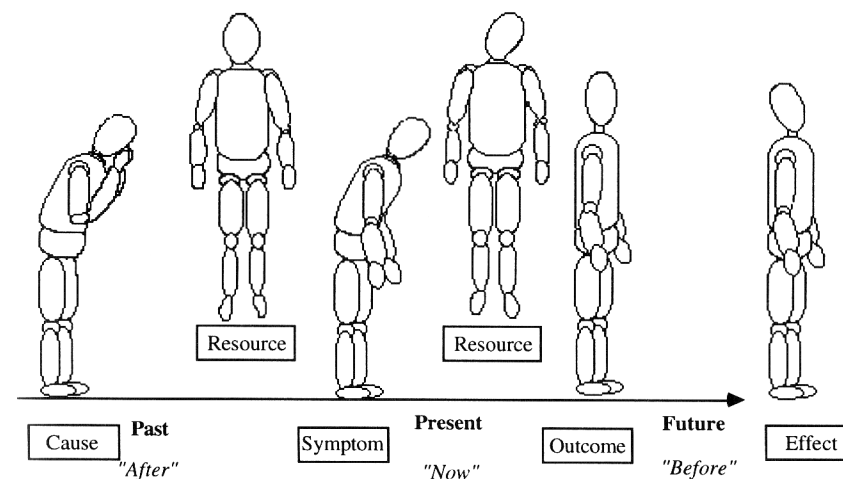
of that size of group? What changes in mental imagery or self talk (color, distance, volume, location, etc.) would reduce the anxiety?

Finding resources through counter examples has a double advantage in that the counter example will have an influence both on the level of behavior or capability and on the level of belief. That is, as an 'exception to the rule' a counter example provides us with alternative operations and pathways within the system we are managing; but a counter example also challenges the universality or 'rigidity' of certain limiting beliefs. For instance, the statement, "Groups that size always make me anxious," is a belief as much as it is a statement about an actual constraining cause. Thus, finding counter examples not only relieves constraints but opens up the possibility for new and more empowering beliefs.⁷

As another example, suppose we have discovered that the person's anxiety is associated with the memory of a past humiliating experience while speaking in front of a group. We can explore areas of potential resources and solution space by asking what knowledge and capabilities the person now has that he or she did not have at that time, that would have made the situation different? How would that past situation have been different if the person had possessed this knowledge or those capabilities at that time? If the person had been as clear about his or her outcome and desired effect as he or she is now, would it have made a difference? How would the person's perception of the memory change if it was experienced 'through time' or 'in time'? What changes of posture, breathing pattern or movement would have positively influenced the outcome of that past experience? What changes in mental imagery or self talk (color, distance, volume, location, etc.) alter the emotional affect of the memory?

⁷ Counterexamples are a powerful therapeutic tool that can even influence physical health. For instance, the NLP Allergy technique (Dilts, 1988 and Dilts, Hallbom & Smith, 1990) applies this structure to help people achieve relief from allergic reactions.

Activating or bringing resources into the problem space may be achieved through 1) some 'real time' process such as simulation or role playing, 2) imagination or 3) the process of association or 'anchoring' (e.g. a resource may be associated with a particular object, symbol or even a touch, that may be used to help activate that resource in the problematic situation).⁸



Bringing Resources Into a Problem Space

Although we have been using a personal example as an illustration, this process can obviously be applied to other 'problem spaces' such as group or organizational issues where symptoms may be issues such as a drop in motivation or productivity. In such an example antecedent causes may range from role conflicts to communication problems. Establishing outcomes would involve setting specific objectives

⁸ NLP has many techniques for activating and transferring resources. In addition to 'anchoring' there are processes such as 'future pacing', the 'new behavior generator', the 'swish pattern' and many others described in the numerous books on NLP.

relating to motivation or productivity. Effects and final causes would include longer term benefits (such as better profitability) and the pursuit of the group or organizational vision and mission. Resources could include changes in technology or procedures and the implementation of training programs or other instruments of organizational learning, etc.

In summary, the process involves the following basic steps:

1. Identify the symptom and the 'constraining causes' related to maintaining the present state.
What is the 'symptom' in this problem?
What constraints, relationships, presuppositions and boundary conditions (or lack of boundaries) are associated with the symptom?
2. Identify the 'antecedent causes' related to the history and development of the symptom.
What is the 'cause' of the symptom in this problem?
Which past events, actions or decisions were involved in creating the symptom?
3. Identify the outcome and the fundamental formal characteristics of the outcome that will be your evidence that the outcome is being reached.
What is the desired 'outcome' or goal that would take the place of the symptom?
What fundamental assumptions and perceptions define this outcome? What will you see, hear or feel that will let you know you have attained your desired state?
4. Identify the desired effects or 'final causes' of reaching the outcome
What will be the longer term 'effects' of reaching that outcome?
What will reaching the outcome do for you? What longer term future objectives, goals or ends give the outcome meaning, relevance or purpose?

5. Identify resources that will help to reach the desired outcome and effect by using the process of induction to explore the structure of other successful situations.
What resources would help achieve the outcome?
In what other situations or contexts are you able to easily attain your desired outcome and/or effect? What is common to those situations?
6. Identify resources that will help to transform antecedent or constraining causes or alter their influence by applying the principles of 'convertibility' in order to find counter examples.
What resources would help influence or transform or alleviate the past cause or present constraints?
In what situations or context does/would the cause or constraints not produce the symptom? What is the difference?
7. Activate or transfer the appropriate resources within the context in which the symptom has been occurring.

Implementing Aristotle's Strategy for Exploring and Organizing a Problem Space

I mentioned earlier that Aristotle's ability to record and express his ideas and discoveries was as important as his ability to make them. This next application combines Aristotle's strategies with an NLP strategy for creative writing and composition (Dilts, 1983) as a method to explore, organize and express one's thoughts about a particular problem space.

The NLP composition strategy leads a person to elaborate and enrich a beginning sentence into a paragraph by using key words or 'prompts' to draw out related ideas through the process of association. For example, one method for finding what Aristotle called "the middle" involves the use of words known as 'connectives'. Connectives are words or phrases that link one idea to another; such as:

<i>because</i>	<i>before</i>	<i>after</i>
<i>while</i>	<i>whenever</i>	<i>so that</i>
<i>in the same way that</i>	<i>if</i>	<i>although</i>

We relate ideas together through these 'connective' words. For instance, if we were to say "Aristotle was a genius," and follow it with the word "because" we would be lead to identify some 'middle term' related to our conclusion. As an example, we might say, "Aristotle was a genius *because* he was able to bring clarity and simplicity to complex issues." This 'middle term' now becomes a first term, and we repeat the process by saying, "He was able to bring clarity and simplicity to complex issues *because* he developed effective strategies for organizing his experience of the world." The process is then repeated again; "He developed effective strategies for orga-

nizing his experience of the world *because* he was able to balance both his own childlike curiosity and his ability to think logically."

This process is continued either a) an arbitrary number of times (such as four or five repetitions) or b) until it becomes difficult to make any other associations. Then, we can collect together our group of associations into a paragraph by simply leaving out the connective word "because" and capitalizing the first word of each phrase. In the above example we would then find a paragraph reading:

"Aristotle was a genius. He was able to bring clarity and simplicity to complex issues. He developed effective strategies for organizing his experience of the world. He was able to balance both his own childlike curiosity and his ability to think logically."

Different connectives will tend to lead us to think in terms of the different types of causes. Words like "while" and "whenever", for instance will lead us to think in terms of 'constraining causes'. Words like "before" and "after" will probably lead us to think in terms of 'precipitating causes'. A phrase like "so that" would lead us to think in terms of 'final causes'; whereas a word like "if" or phrase like "in the same way that" will prompt us to think in terms of 'formal causes'. A word like "although" prompts us to find potential constraints and counterexamples and helps us to check the strength of our premises.

For example, if we took the same beginning statement used above, "Aristotle was a genius" but applied the connective phrase "so that" we will end up with a completely different train of associations. We might say, "Aristotle was a genius *so that* The wisdom of the Greek civilization was expressed and preserved for future generations *so that* We can continue to revive and apply that wisdom to today's problems and issues *so that* The generations that follow us

will have a better world *so that...*”, etc. Applying the connective “if” would lead us in another direction: “Aristotle was a genius *if* We consider the amount of influence someone has on later generations as an indicator of genius *if* We value long term contributions more than short term successes *if* We are able to seriously ‘calculate and deliberate what is to come by reference to what is present’ *if...*”, etc.

It is also possible to sequence connectives in order to draw out more complex patterns of associations. For instance, we could start by saying, “Aristotle was a genius *in the same way that* Leonardo was a genius.” Then we could shift to another type of connective, such as “because” in order to draw out our ideas about that relationship.

We can also direct our associations to perceptions involving different sensory representational systems and different time frames by adding some additional prompts after the connective. For example, adding the words “because I see that” will lead us to focus on our own visual perspective. Adding the words “because he said that” will direct us to another perspective and representational modality.

The table below shows a listing of possible connectives, perspectives and representational system words that can be combined using this type of strategy to explore a problem space.

<u>Connective</u>	<u>Perspective</u>	<u>Representational System and Time Frame</u>	
because	I	see(s) - saw - will see	<i>that</i>
before	We	look(s) - looked - will look	<i>like</i>
after	You	show(s) - showed - will show	
while	They	hear(s) - heard - will hear	
whenever	He	sound(s) - sounded - will sound	
if	She	say(s) - said - will say	
although	It	feel(s) - felt - will feel	
so that		touch(es) - touched - will touch	
in the same way that		move(s) - moved - will move	

The following steps summarize one way to apply some of the information we have gathered about Aristotle’s strategy for analysis using the method I have just described.

1. Choose a topic, subject or phenomenon to analyze or ‘unravel’ and identify several examples to refer to.
e.g. Topic: *Genius*
Examples: *Aristotle, Leonardo, Einstein*
2. Consider what is common to all of the examples you have chosen.
3. Make four beginning sentences by answering Aristotle’s four fundamental questions:

What is its nature?

X is/are _____.

What are its attributes?

X has/have (many) _____.

What causes or makes it?

_____ causes/makes X.

What does it cause or make?

X causes/makes _____.

For example:

“Genius is the ability to discover, create or represent fundamental ideas and relationships.”

“Geniuses have the ability to perceive many dimensions and levels of a problem space.”

“Special but learnable cognitive strategies cause genius.”

“Genius makes it possible to find new ideas and translate them into reality.”

4. Check your premises by applying Aristotle's rules of conversion, finding areas where there are potential counter examples and exceptions to the rule.

e.g. *Is it possible to discover, create or represent fundamental ideas and relationships and not be a genius?*

Is it possible to have the ability to perceive many dimensions and levels of a problem space and not be a genius?

Is it possible to be a genius without special but learnable cognitive strategies?

Would it be possible to find new ideas and translate them into reality if there were no geniuses?

5. Explore the 'causes' and 'middles' related to your premises by using prompt words such as "because" and writing down the association that comes up for you. Continue to use the prompt after each answer in the manner described earlier in order to draw out your ideas related to the topic.

- a) To explore constraining causes you can use the words "while" or "whenever."
- b) To explore precipitating causes you may want to use the words "before" or "after."
- c) To explore formal causes you can try the words "in the same way that" or "if."
- d) To explore final causes you can substitute the phrase "so that."
- e) To explore potential counterexamples and constraints in order to check the strength of your cause-effect premises you can substitute the word "although."

You can add sensory oriented terms such as "because I see" or "after he felt," etc. in order to explore different sensory channels and perspectives.

6. Read the sentences/ideas you have written one after the other leaving out the connective words. If what you have written does not adequately represent all of your ideas, you may repeat the process again with a different set of prompts. If you are satisfied with the flow of ideas then you may now refine or add to them to make them into a paragraph and write them down.
7. When you have finished exploring all four beginning sentences, you may want to identify another set of three examples that have the same quality. Determine what is common to these examples. Find the characteristics that are similar between the two sets of common elements from the different sets of examples.

Finding A System of Causes In A Problem Space

Another way to apply this method as a means of exploring potential causes and problem space would be to pick a problem or symptom and then systematically go through each of the connectives to find any relevant associations, assumptions or beliefs. For example, if we were to choose to explore the problem space of the symptom of anxiety related to public speaking we could have the person start with a statement of the problem or symptom such as "I get anxious when I speak in front of a large group." Holding this problem statement constant, we lead the person through each connective to explore the total 'space' of causes related to that symptom:

e.g.

I get anxious when I speak in front of a large group
because _____

I get anxious when I speak in front of a large group
before _____

I get anxious when I speak in front of a large group
after _____

I get anxious when I speak in front of a large group
while _____

I get anxious when I speak in front of a large group
whenever _____

I get anxious when I speak in front of a large group
so that _____

I get anxious when I speak in front of a large group
if _____

I get anxious when I speak in front of a large group
although _____

I get anxious when I speak in front of a large group
in the same way that _____

Different perspectives, representational systems and time frames could be added in order to make an even more thorough exploration of the problem space. That is, applying the table provided earlier, the person could cycle through various prompts such as, "I get anxious when I speak in front of a large group *after I hear that...*" or "I get anxious when I speak in front of a large group *because they look like...*" or "I get anxious when I speak in front of a large group *in the same way I felt that...*", etc.

This process can then be repeated with the statement of the outcome to identify potential desired effects and final causes. Thus, if the person's outcome statement is, "I want to feel comfortable and confident when I speak in front of a large group," we would have the person hold this statement constant and repeat the cluster of connectives:

e.g.

I want to feel comfortable and confident when I speak in front of a large group

because _____

before _____

after _____

while _____

whenever _____

so that _____

if _____

although _____

in the same way that _____

Resources may be identified by altering the outcome statement slightly and repeating the process. Instead of saying, "I want to feel comfortable and confident when I speak in front of a large group," the person can say:

I can/will be comfortable and confident when I speak in front of a large group

because _____
before _____
after _____
while _____
whenever _____
so that _____
if _____
although _____
in the same way that _____

Again, the table provided earlier may be used to explore different perspectives, representational systems and time frames in order to make an even more thorough exploration of the desired state and potential 'solution space'.

Through the use of such verbal 'prompts', the sophistication and power of Aristotle's strategy can be harnessed and applied to everyday issues and problems. The method is so simple that even a child can do it. In fact, I have been involved in developing applications of this strategy that help children as well as adults to develop problem solving and creative writing skills.⁹ The applications involve putting the prompting words on the faces of a specially designed block. The block may then be rotated, revealing the key words in a particular sequence. The method has been used with success to teach children and adults who have difficulty writing, as well as to release and enhance the skills of average writers.

⁹ Available from Text Blox Inc. of Santa Cruz, California. See Afterword for further information.

Summary

In this chapter we have applied NLP processes for micro, macro and meta modeling to studying and utilizing Aristotle's strategies for getting to 'first principles'. We have explored how Aristotle used such meta strategies as asking basic questions and the process of 'inductive reasoning' to explore the basic structure of various 'problem spaces' and then to express that structure in the form of verbal 'syllogisms'.

On the level of his macro strategies, we have explored how Aristotle sought to determine the influence of formal causes, antecedent causes, constraining causes and final causes in the mechanisms of both biological and inorganic phenomena. We also examined his views on the role of time perception and different types of perception of time, and some of Aristotle's methods for evaluating the depth and 'universality' of his own conclusions, assumptions and premises.

At a micro level, we reviewed Aristotle's model of the mind (or 'psyche') and the role of the five senses in the thinking process. We examined Aristotle's perspectives about the mechanism and significance of memory, imagination and the fundamental process of association. We also explored Aristotle's ideas about the influence of specific characteristics and qualities of sensory experience and the important role of 'common sensibles' in thinking. By utilizing certain language patterns as a tool for modeling underlying cognitive patterns we outlined the micro structure of Aristotle's thinking strategy.

Synthesizing the information from these various explorations into an 'instrumental map', we have gone over some techniques and methods for applying Aristotle's strategies by combining them with certain NLP principles and processes. I have presented one method for defining a 'problem space' and am seeking new solution spaces utilizing the S.C.O.R.E. model, and another involving the use of key words and special verbal 'prompts' for discovering, organizing and ex-

pressing new areas of a problem space and potential resources and solutions.

In addition to what we have learned about Aristotle we have also introduced most of the basic NLP distinctions and models including the S.O.A.R., T.O.T.E., R.O.L.E. and S.C.O.R.E. models. The S.O.A.R. model provides us with the basic 'meta' distinctions of 'problem space', 'states' and 'operators'. The T.O.T.E. model provides the basic distinctions related to the fundamental feedback loops that make up our 'macro' strategies in terms of our 'goals', 'evidences' and choices of 'operations'. The R.O.L.E. model provides the essential distinctions for modeling the cognitive micro structure of a person's strategies including representational systems and their orientation links to other mental processes and their effects within the strategy. The S.C.O.R.E. model provides the fundamental elements involved in defining a problem space and reaching appropriate resources and adequate solution space.

In the following chapters, we will continue to revisit and apply Aristotle's methods to our study of the strategies of the other geniuses we will be examining. Using Aristotle's methods, perhaps we can arrive at some universal premises and first principles that will enlighten us even more richly about the practical nature of the strategies of genius.

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