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by Mohamad Osman

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Neuro-Linguistic-Programming is a Science

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I dedicate this dissertation work to my supportive father Doctor Osman Saleh Osman, my caring mother Hana Jamil Kalach, in addition to my life-coaches and trainers at the InOut Academy Imad Salman and Zeina Daroub. I would also love to thank my personal psychiatric Dr. Osama Dahdouh for his continuous follow up with me since 2012 up until finishing this paper of work.

I express my extreme sense of gratitude and appreciation to my Master's Degree Dissertation tutor Dr. Konstantinos Vrachimis for his positive and motivational feedback and support whenever I needed throughout this dissertation journey. I would also love to thank the participants who were committed to practice openly in all of the procedures designed.

I had experienced so much pleasure, curiosity, and no doubt at all at any of the stages of this dissertation work and this was due to my relatively older belief that certain psychological tools must exist that can specifically target performance and improve it; therefore, I was very enthusiastic while searching for the historical scientific roots of the development of the interdisciplinary field of NLP. Consequently, and fueled with my mechanical engineering spirit, I set out for explaining the main NLP-techniques that improves performance both physical and mental performance, and this was done both qualitatively and quantitatively. The target audience for this dissertation work can go very wide spanning psychologists, educators, statisticians, and even philosophers. In addition I will be very happy to repeat my acknowledgement for everyone mentioned above that helped me either directly or indirectly in the success of this dissertation work that I (Mohamad Osman Osman) have prepared, designed, and executed at BekaaValley-Lebanon-the Middle East in the period that lasted from February 2024 to May 2024.

Contents

Abstract:
The puzzling mess of whether a certain field of knowledge is considered to be science or just pseudoscience is a serious issue that occupies the minds of researchers (and truth-seekers in general). One of the main criteria that governs something to be scientific is the objective analysis of the results that it generates; therefore, in this dissertation I have set out to prove the scientific evidence of Neuro-Linguistic-Programming (i.e. NLP) through three main approaches (1) tracing back the history of the congregation of sciences that formed the science of NLP and this will also be a way of a literature review, (2) performing a detailed analysis on NLP techniques and how they are directly useful for performance, and (3) using descriptive statistics to quantitatively validate my alternative thesis that NLP improves the performance of human beings (both mental and physical performance) thus it has measurable and optimal results that prove it to be an effective science too. The materials that I will use are a chronometer to record the time taken for each of the tasks prescribed as well as an air bike for the strategy technique that will be used. In addition, simple materials like papers and pens will also be needed. This academic research has proven that certain NLP-techniques improves both the mental performance and the physical performance of human beings and these were manifested by the decrease in the average times to finish certain prescribed tasks. Consequently, it is very important to consider the integration of these NLP-techniques into the academic curriculums of schools as well as the daily routines of athletic academies.

Outline of the Report:

As a general outline that acts as a roadmap for this document/report, it will be divided into five chapters/sections/parts as follows:

- **Chapter 1 = an Introduction:**
  This will be an introduction on the history of NLP and how this technique evolved over time to become a mix of scientific techniques therefore it is purely a science and not pseudoscience in anyway.
- **Chapter 2 = what is NLP:**
  This will be the proposed model of NLP and will contain the following:
  [2.1] NLP as an interdisciplinary field of knowledge: how data science is an integration of three well-proven sciences therefore is a science on its own and not pseudoscience.
  [2.2] the NLP's Model of Therapy: what is the exact theory behind NLP and the "how it works".
  [2.3] the NLP-techniques used: five techniques have been chosen and explained both theoretically and practically.
  [2.4] the Exercises used: certain critical thinking, imaginative, and practical exercises have been chosen and analyzed. These exercises are direct applications of the five NLP-techniques discussed above (i.e. [2.3]).
  [2.5] Improving Performance: the philosophy of performance and what does it mean to improve performance.
- **Chapter 3 = Research Methods:**
  Based on "Chapter 2" that is detailed above, I will be applying a battery of tests that includes all of the five detailed NLP techniques. This battery of tests is basically for the mental performance aspect and is the same exercises used in [2.4] above but will be more complicated and will act as "an after analysis" i.e. after learning the techniques. Then I will be applying on field tests to a team of soccer athletes to prove the effectiveness of those NLP themes/techniques with the physical performance aspect. The on field tests will include the use of descriptive statistics that will be transformed into visualization tools specifically histograms and boxplots.
- **Chapter 4 = Results and Discussions:**
  Will present the results of both of my analysis (i.e. the mental performance analysis followed by the quantitative statistics analysis for the physical performance analysis) and will also present the discussions/analysis/interpretations of these results. Note that these results could be presented graphically or/and non-graphically.
- **Chapter 5 = Conclusions and Future Scope:**
  This will be the last chapter and will include the detailed conclusions of this study/report and the future recommendations for any improvement on it. This chapter will also include discussions what our findings mean in relation to the theoretical and practical bodies of such knowledge. Therefore, in short, this chapter might include sub-chapters of: discussions, conclusions, implications, and recommendations (where one of the most common future recommendations is to cover any research gap done in this study/report).

[1] Introduction:

Throughout history, civilizations have ruled the world by their knowledge which is a direct by-product of data. It is a (contemporary) postulate that "data is power" and whoever owns data owns power, thus be in a strong position both locally and worldwide. Although the above mentioned is hundred percent true, there lies the problem of what data is considered to be a scientific data (which is the main trend in our current era) and which is considered to be what is called Pseudoscience. Soon enough we will be tackling the definitions of many of the terms dealt with throughout this dissertation, but our main concern now is the problem/issue that arises from the classification of a certain field/modality as pseudoscience or science. This classification is not a mere one, since it dictates people's perspective toward this field i.e. whether this field is trustworthy as a valid scientific approach or it is just an illusion or even magic of a pseudo-typed approach. One of the most debatable zones of this conflict occurs between psychiatrists, psychologists, and psychotherapists. Maintaining respect for each one of the mentioned professions, the first considers himself a doctor and usually is oriented towards prescribing medications while the second perceive themselves as those that not necessarily prescribe medications (although legally they cannot do so) but only practice scientifically proved approaches to treat their clients/patients. Now the third group of people are those that are not doctors nor hold a psychology degree but still have some certain abilities and repertoire of knowledge of therapy, treatment, and healing modalities the majority of which are considered non-valid by psychologists and more harshly by psychiatrists.

The above mentioned trend in judgments is totally understandable as every group of people tries to claim clear truth and try to fatally support their views while diminishing others. Of course this doesn't mean that we as researchers should stand still and neutral towards all of that and this what triggered my motivation to delve into this realm of psychotherapy and insist on proving that many modalities are not pseudoscience/witchery/jugglery/etc… specifically that I am personally a bachelor psychology student, a son of a very famous doctor, and a master practitioner of NLP (Neuro-Linguistic-Programming) who practices everything I have been taught in that approach, all of which, made me curious to set-up this journey of my dissertation to study and analyze NLP and how this is purely science and nothing close to any of the above-mentioned heresies !!

I do not claim that I am the first to research about the topic of NLP, but my main strength will be in tracing back the emergence of NLP-current concepts from as early as 1870's and how their evolution throughout history has made today's brilliant concepts of NLP. In addition, I will be detailing certain chosen NLP-techniques and explaining their philosophy/theory and how they can be placed in action/practice by deploying them into the field of Applied Psychology specifically Performance Psychology. I believe that the above three points are lacking up until today's literature (that I have intensively researched). Therefore everyone is welcomed to pick and choose, criticize or like, and contribute in any way to this dissertation because I am writing it for the benefit of everyone specifically that the field of NLP itself is an interdisciplinary field thus it is suitable to be employed by Psychiatrists, Psychologists, Linguistics, Computer Scientists and Intelligence/Technology developers, etc… so this dissertation will be available to the

public in general and more specifically for those doubting the usefulness of NLP whether as a practice or whether as it being a true scientifically proven modality.

I have always wondered that if NLP is not a valid science then it definitely wouldn't be having a history of its evolution; therefore, I have set out to trace NLP from the early 1870's till our current days. Although this might seem a bit lengthy, but I believe that it is the best way to set-up extremely strong foundations to support the fact that NLP is true science, based on many sciences meeting together (for the service of humanity) and that it is not pseudoscience in any of its aspects.
The way I adopted to detail the history of "Neuro-Linguistic-Programming" (shortly "NLP") will be the use of a timeline and this is so for two main-reasons. The 1st is personal, because, I am an extreme visual person and the 2nd is general for the readers/audience since the timeline method details so many information, yet into a much summarized graphical way. Note that those summaries (including their details) are chronologically ordered which definitely quadruples the effects.
Getting straight into my first schematic in this dissertation, the timeline is as follows:

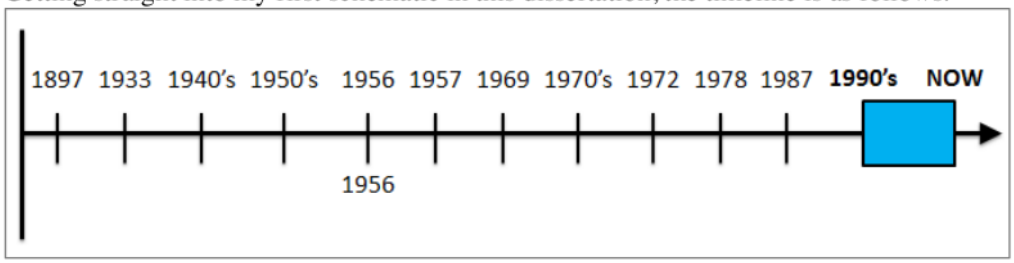


Figure 1 = the timeline of the development of NLP.

Now in what follows I will be detailing the main milestones that the human-scientific history has passed through while focusing on how each of the milestones are scientific facts in themselves too:

1897 = Ivan Petrovich Pavlov
Classical Conditioning
The Russian physiologist Ivan Pavlov studied classical conditioning with detailed experiments with dogs, and published the experimental results in 1897.

1933 = Alfred Korzybski
General semantics
Which is a school of thought that incorporates philosophic and scientific aspects…, it describes itself as a scientifically empirical approach to cognition and problem solving.

1940's = Gregory Bateson
Integration of Sciences
He helped extend systems theory and cybernetics to the social and behavioral sciences.

1950's = Paul Watzlawick
Communication Theory
Watzlawick's work based on Bateson's thinking, *Pragmatics of Human Communication*, with Don Jackson and Janet Beavin, became a cornerstone work of communication theory.

1956 = Eugene Galanter
Further Integration of Sciences
Galanter had started working towards a theoretical model that would integrate cognitive processes into the behaviorist's stimulus-response framework.

1956 = George Armitage Miller
Memory Capacity Quantification
He authored the paper, "The Magical Number Seven, Plus or Minus Two,"… an average limit of seven for human short-term memory capacity.

1957 = Milton Erickson
The ASCH
Erickson formed the American Society of Clinical Hypnosis (ASCH) in July 1957.

Figure 2 = part one of the timeline.

1969 = Friedrich Salomon Perls
Gestalt Therapy
At Esalen, Perls collaborated with Ida Rolf, founder of Rolfing, to address the relationship between the mind and the body.

1970's = Jay Haley
Structural Family Therapy
Through his collaboration with Salvador Minuchin and Braulio Montalvo, he influenced (and was influenced by) the evolution of Structural Family Therapy in the early 1970s.

1972 = Richard Wayne Bandler
Modeling of Cognitions
Richard Bandler, an undergraduate student of psychology, approached John Grinder for assistance in specific aspects of modeling Gestalt therapy.
From there Grinder and Bandler modeled the various cognitive behavioral patterns of therapists.

1978 = David Gordon and Robert Dilts
Therapeutic metaphors
David Gordon has written many articles about NLP and four books, one of which was "Therapeutic Metaphors" and Robert Dilts who studied personally with Milton H. Erickson, M.D., and Gregory Bateson.

1987 = John Thomas Grinder
New Code of NLP
Between 1982 and 1987, Grinder and Judith DeLozier collaborated to develop the "New Code of NLP".

1990's NOW

Trainings
This period characterized by the formation of NLP associations, corporations, and training boards/academies/etc…

Figure 3 = part two of the timeline.

Before starting to depict the timeline into a coherent series of events in a paragraph that eventually lead to the formation of NLP, I will prefer to start by stating the following comments. We need to firstly be able to distinguish between the issue of publications and confidentiality i.e. if a certain book is released in the 1970's this does not mean that it was authored/written at that date and what is only meant that it was released to the public after being kept aside due to its secret nature or non-understanding of the people who were at that certain historical context. Secondly and accordingly, all of the dates (and their relevant events) are what I have found in the web and the libraries that I have visited; therefore, these might not be the hundred-percent origin of the things, but definitely they are the most accurate I could have reached. Thirdly these only represent the main events (and just a brief on each) that occurred and some of the details I have excluded for the sake of clarity of the timeline and sufficiency of the information depicted in it. Fourthly the gaps between each pair of strips in the timeline are not consistent/equal and this is reasonable/logical since the evolution of other fields of sciences (even if directly unrelated) contributed dramatically to the history-development-evolution of NLP, in addition to, the above mentioned point regarding the reviving of some old knowledge from time to time (thus the more sciences we have, the more exponential/faster proceeding we expect). Next to last, it is very important to note that although it is a timeline, the sequence of events resembles that of a jigsaw puzzle i.e. bits and pieces of the N(s), L(s), and P(s) congregate/mold together thus forming the whole picture of the NLP-modality and this is specifically true since the pattern of development

of sciences then the integration of those developments (holistically) was obviously repeated. Finally, some names of well-reputed scientists are missing because the intention is the tracing of NLP not the inclusivity of all the names into this/the timeline.
Now referring back to the above mentioned model of the jigsaw puzzle we can say that this timeline's approach can be (somehow) represented as follows:

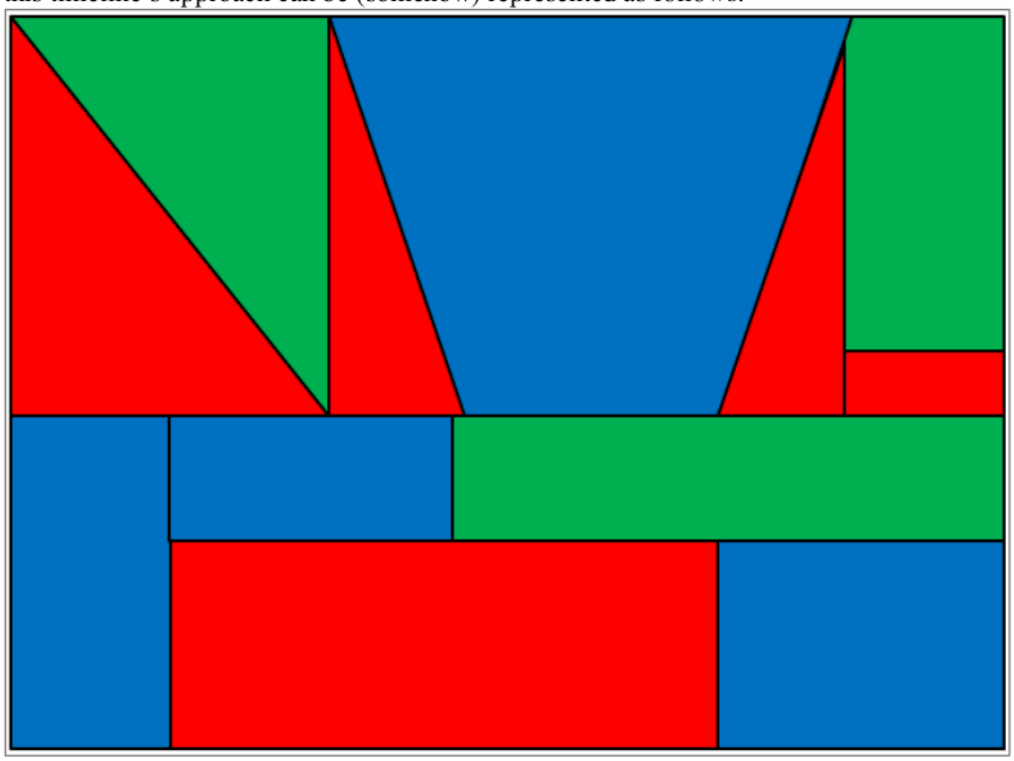


Figure 4 = NLP as a jigsaw style.

I believe that it is time to detail the timeline using the events and names accompanying it. Out of my search I have detected that everything started out from the concept that nothing is random and that for every action there is an equal and opposite reaction. This is the exact point that the Russian Physiologist Ivan Pavlov started his experiments with. This is definite because his classical conditioning theory is primarily based on the concept that for every stimulus there will be a certain response. In addition Sr. Pavlov introduced the concept of dynamics with these stimuli since with time the nature of the stimuli and their respective relationships with their respective responses changes (I will not further detail this point here since it will not serve my timeline). Now comes the work of Alfred Korzybski who introduced the field of General Semantics which is defined as "a school of thought that incorporates philosophic and scientific aspects… it describes itself as a scientifically empirical approach to cognition and problem solving". With the introduction of this field, the linguistics part is integrated into the seed of stimulus-response mechanism such that different language, with every other variable constant, result in varied outputs. Afterwards the inputs of Gregory Bateson were so valuable since "he helped extend systems theory and cybernetics to the social and behavioral sciences."

Then “Paul Watzlawick's work based on Bateson's thinking, Pragmatics of Human Communication, with Don Jackson and Janet Beavin, became a cornerstone work of communication theory.” Till this point in time it became clear to the heritage of humanity that certain patterns exist between the elements of the society themselves and that those patterns are applicable to all the human-population through the communication theory. This is exactly when Eugene Galanter realized the importance of the idea of thoughts dynamics and the availability of different variations/options from person to person, but where the outputs closely resemble each other; therefore, he developed a theoretical model that included cognitive dynamics into the static stimulus-response mechanism. Here George Armitage Miller delved deeper into the idea of cognitions and started his experiments to try to quantify the qualitative capacities of humans, more specifically, the capacity of the short-term memory thus publishing his famous paper titled “The Magical Number Seven, Plus or Minus Two” denoting the fact that the mentioned memory has an average remembering ability of seven items with the lower and upper bounds being 5 and 9 items respectively. Parallelaly and during these years, Sr. Erickson was working very hard on the main concept that the language effects (or any other technique in general) can have both direct and indirect effects, for example, reporting a story/metaphor for person X would have different affects than when reporting the same exact story/metaphor to person Y. In addition the work of Milton included the study of how the unconscious resistance of certain people hinder the process of healing without them realizing (nor meaning that of course). The studies of Milton Erickson culminated, in July 1975, by him forming the ASCH (i.e. the American Society of Clinical Hypnosis). Well at this point in history people started conceiving that facts are not only physical, but meta-physical too. This is when Friedrich Salomon Perls “collaborated with Ida Rolf, founder of Rolfing, to address the relationship between the mind and the body.” i.e. the semi-metaphysical to the purely physical respectively in a therapy named the “Gestalt Therapy”. Moving into the 1970’s, the mainstream psychotherapy was tilting towards “Family Therapy” i.e. the therapy of a group of people that are inter-related in a family bonded relationship(s) and this is where Sr. Jay Haley influenced the evolution of structural family therapy. Finally we have reached the episode, before our current one, that spanned the early 70’s up until the late 80’s which was characterized by the technological development most prominently the appearance of computers with their very organized, systematic, accurate, and extremely fast computations. This latter factor made psychotherapists feel the need to model the mental processes/cognitions of humans since they believed that humans that created computers must think in the same way as computers do thus for perfection purposes, we need to turn them (i.e. the humans) into machines too !! Regardless if this is partially/totally true or wrong, these models have been intensively been worked upon by John Thomas Grinder then later a bit by his undergraduate psychology student who approached him for a question during office hours. This student was named Richard Wayne Bandler who fortunately started with his professor in the modeling of cognitions/behaviours, but unfortunately up until a point in time where they sued each other legally for intellectual and copyright issues. In addition tremendous work was done by Robert Dilts to overcome the critical faculty barrier of humans during therapy where he insisted (and developed) the use of “Therapeutic Metaphors” which was also a latent attempt (whether meant by Sr. Dilts or not) to convey that humans cannot be hundred percent machines!! Last but definitely not least, we have reached our current period

which is categorized by the establishment of NLP associations, corporations, and training boards/academies/etc… where we have reached, in one way or another, consensus on the super importance of NLP and where the menu of any glossary of NLP contains terms like "Reframing, Sub-Modalities, Eye Patterns, Meta-Programs, Strategies, Sleight of Mouth, Hypnotic Language Patterns, Representational Systems, and many more" out of which we will be discussing almost all of them in this very humble dissertation work.

Research Motivation:

In connection with all of the above, I was highly motivated to set out my journey in this dissertation because I wanted to scientifically shed light into the NLP-modality and prove that it is an accumulation of the integration and congregation of more than one scientific field mainly Neuroscience, Linguistics, and Programming. Logically speaking a system that is formed from all scientific components will definitely be a scientific system itself; therefore, there is no place for saying that Neuro-Linguistic-Programming is pseudoscience since all of its forming components i.e. Neuroscience, Linguistics, and Programming are all sciences.

Purpose of the Study:

There are two main purposes that sparked the fuel of my motivation towards performing this study and these are the illiteracy of the vast majority of scientists towards both the history of the formation of NLP and the effectiveness of NLP as a scientific tool to therapy/healing. As a consequence, the purpose of my study is to clarify the science behind some major NLP-techniques then experiment their effectiveness by applying them to the field of Applied Psychology, more specifically, Performance Psychology.

Statement of the Hypothesis or Research Question:

As a result, my research question is: How does NLP contribute to the psychology of performance? And my research hypotheses would be, H_a: the "Neuro-Linguistic-Programming" modality improves performance, and H_0: there is no significant difference in performance with the application of NLP techniques.

Significance of the Study:

This study will be significant for practitioners, researchers, and policymakers because it will be firstly qualitatively proving the importance of Neuro-Linguistic-Programming as a science then secondly the quantitative effectiveness of some of its major techniques. This will be done through an exploratory sequential research methodology i.e. one that starts with the qualitative data collection and analysis, followed by the/a quantitative data collection and analysis.

Delimitations, Limitations, and Assumptions:

One of the greatest strengths of this study lies in the delimitation that the timeline of the evolution of NLP was performed after I personally have successfully finished my masters practitioner certification in NLP therefore I am hundred percent aware and confident of what I am setting out to prove scientifically. In addition, I am also a Cognitive Behavioural Therapist, Psychoanalyst, Psychosomatic Therapist, Master Practitioner in Hypnosis, Master Practitioner Timeline-Therapist and (to summarize things out!!) an Athletic-Coach and also a Life-Coach. All of that made my approach a much more inclusive approach taking into account NLP from a holistic perspective rather than a deductive-simplistic perspective. The latter is very important since it is extremely rare for one individual, out of passion and devotion, to study all of the above mentioned

disciplines; therefore, the insights are built by an educational/awareness journey taken by the same individual and this saves the topic from the pollutions resulting from different inputs of different people coming from different fields no matter how much they seek to be holistic, would never reach the level of one person taking all of the above mentioned approaches. The latter point does not mean that I have ignored the cocktail of inputs from other schools of thought; on the contrary it means that each piece of input was logically stacked together by the same seeker.

Another important delimitation lies in the fact that the participants who participated in the quantitative phase, of the data collection and analysis, were all given a complete day off where they were simply meditating, watching moving, and having rest. This guaranteed that the next day morning all of the participants have been fully rested from any kind of exhaustion being it mental or/and physical. Furthermore all other variables like their age-range/relevant skills level/etc… were kept constant across all of them. In addition the location of my experiments was equidistant from all the participants and was even less than five kilometers away from any of them. Finally, the procedures of testing were all the same among the participants when they were tested individually and enough breaks were given to all of them after being tested (both individually and as a whole group).

The greatest limitations that I could not control in my experiments revolve around the following three points. Firstly it was very hard to ensure that there were no latent injuries or any kind of sickness (like an asymptomatic flue/eczema/etc…) in any of the participants since they all seemed very healthy. These factors might have affected the performance of the participants thus the results of my tests and they are totally uncontrollable since some of them can be related to very subtle things like the weather, presence of a certain smell, a latent injury that appears under excessive/high intensity performance, etc… Secondly I couldn't trust that the NLP-techniques used were preferred by all of the chosen participants although I have detected their preferred representational systems (refer to the definition of terms below), but things get sophisticated when these systems are involved in a dynamic and changing nature like physical (or even mental) exercise. Thirdly I have tried my best (by distributing questionnaires before the tests) to guarantee that the performance of the participants is their maximum, whether when tested individually or in a group, and this primarily centers on the idea whether the participant is a morning-person vs. a night-person.

Finally I will be getting into the assumptions of my study. I have assumed that the given breaks are sufficient for recovery of necessary functions; furthermore, the same applies for the day off taken before the testing date. Another assumption lies in the fact that the performance of each participant under three different days was sufficiently represented by the average of those three days i.e. no significant discrepancies/outliers occur between the days. Thirdly I have assumed that the contexts/characteristics of the physical location is not an influencing factor in anyway i.e. the performance on that field does not change from the first time to the second due to the participant getting used to the dimensions/environment of the field (playing ground/class/etc…). Furthermore, I have assumed that the motivation level of the participants is high enough for them to give the best that they can and that each participant has no problem when performing in a group task, for example, being cautious of judgment from his colleagues nor the comments of their parents on any of their performance results. The assumption that the warm-up done on each of the testing days was sufficiently enough to warm the participants to their

optimal performance point without consuming much of their energies and that this warm up included flexibility, cognitive, muscular and cardiovascular work. Last but not least, no learning bias occurs from one repetition to another since the exercises are varied in a way that avoids/cancels such a bias from occurring.

Definition of Terms:

I would love to add the fact that all of the necessary (and basic needed) definition of terms for this study/dissertation are included in the schematics that are added as figures and if the reader is to expand their knowledge of terms on this topic (and NLP in general) they may resort to the "definition of terms" part of the appendix at the end of this document where it is important to note that:

[1] Some of the defined terms might be known to the reader but are defined here in relation to their use in the field of NLP.

[2] I have chosen the best definitions out of several that I have researched.

[2] Proposed Model:

[2.1] NLP as an interdisciplinary field of knowledge.

I would love to begin with the definition of what is Neuro-Linguistic-Programming and I will be doing so using the following schematic:

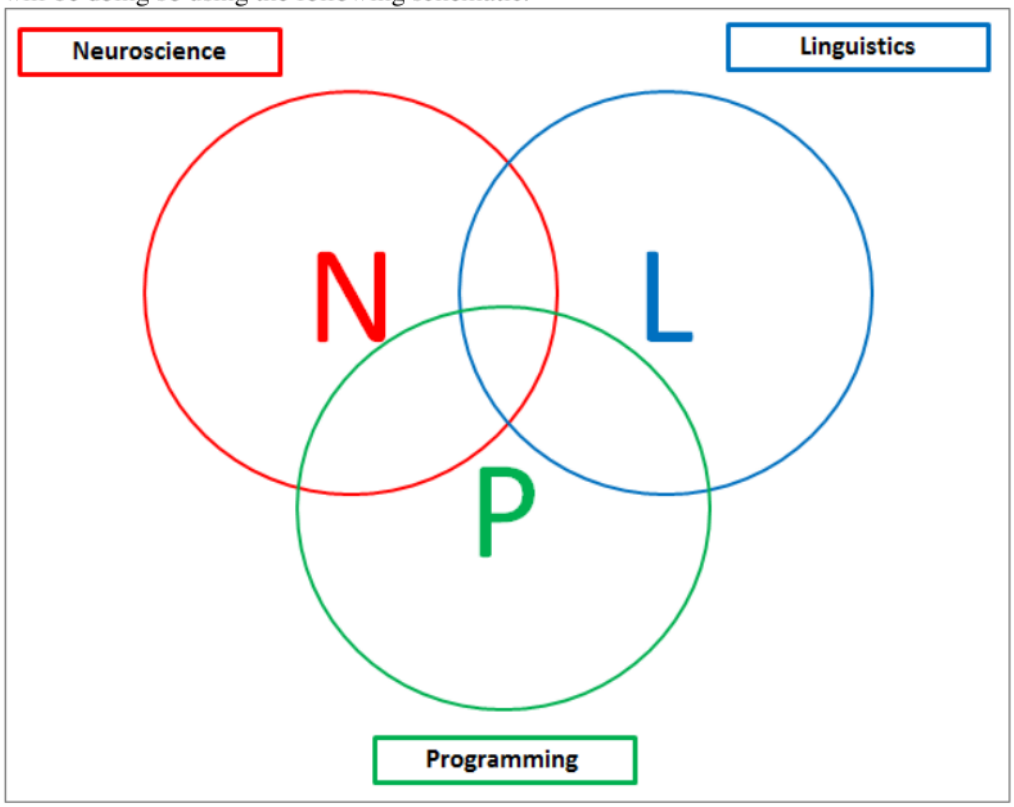


Figure 5 = the inter-disciplinary field of NLP.

and writing this in words:

"NLP: it is a discipline that combines the three fields of Neuroscience, Linguistics, and Programming.

Neuroscience: specifically the nervous system (the mind) through which our experience is processed via five senses:

- Visual
- Auditory
- Kinesthetic

- Olfactory
- Gustatory

Linguistics: language and other nonverbal communication systems through which our neural representations are coded, ordered, and given meaning. This includes:

- Pictures
- Sounds
- Feelings
- Tastes
- Smells
- Words i.e. Self-Talk

Programming: the ability to discover and utilize the programs that we run (our communication to ourselves and others) in our neurological systems to achieve our specific and desired outcomes.

Therefore: NLP is how to use the language of the mind to consistently achieve our specific and desired outcomes."[1]

It is also important to realize that NLP is an interdisciplinary science just the same way that data science itself is an interdisciplinary science that is made up of:

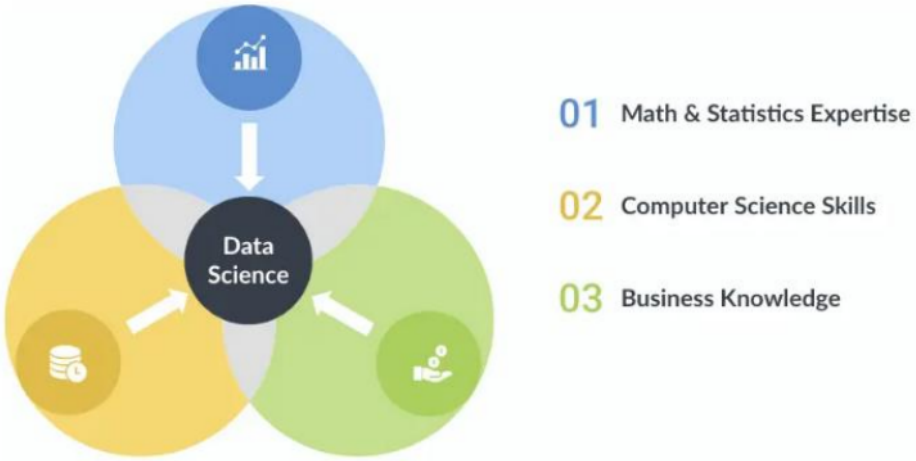


Figure 6 = NLP is analogous to Data Science.

Therefore it is very important to view NLP from the same perspective as that of Data Science itself.

[2.2] the NLP's Model of Therapy.

The main philosophy of NLP is that it starts from the main roots of inputs that we receive through our five senses and this is based on the scientific communication model:

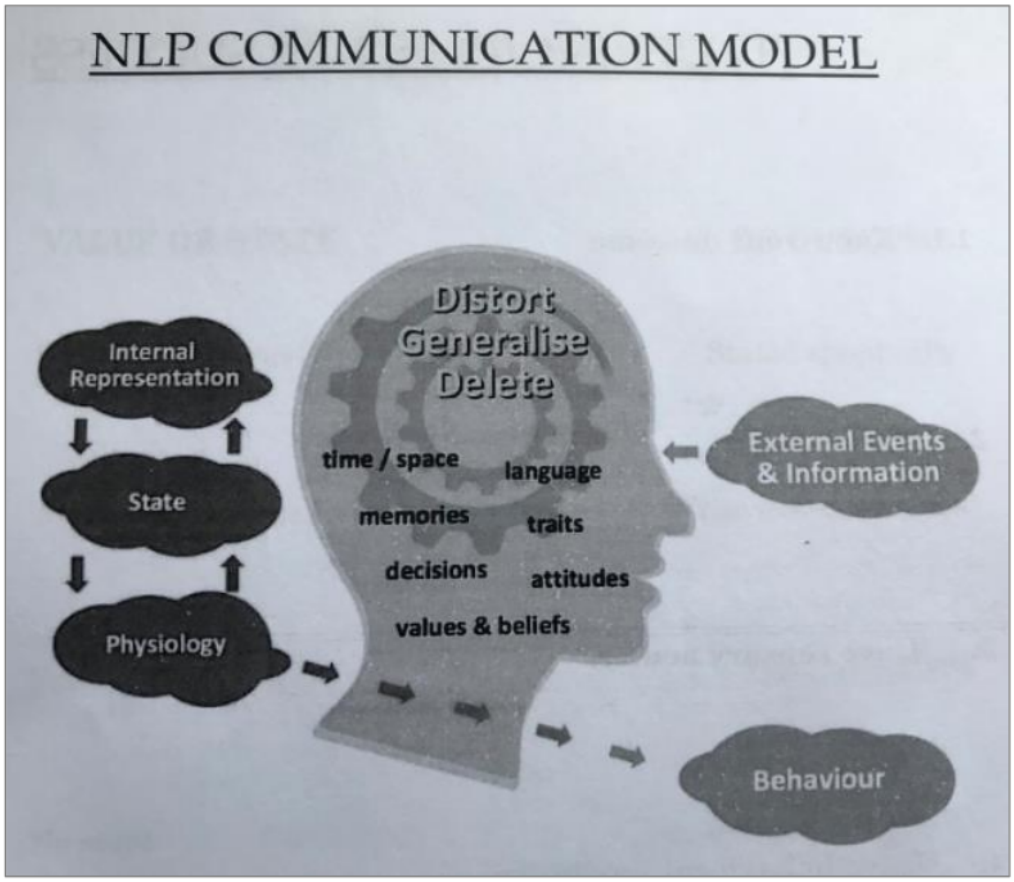


Figure 7 = NLP communication model.

Thus the main change would be to have full awareness of the external events and information that we receive from our external world and this awareness lies in the fact that all of these (external events and information) are received/coded by our five senses i.e. by the modalities or representational systems, and that this coding is done via the specific sub-modalities of each of the modalities. Therefore to generate change we need to understand the dynamics of these recorded sub-modalities and this is clearly shown in the above NLP-model of communication. To clarify this we receive a very large amount of data from our environment, but not all of it is absorbed/detected by our senses and this is due to the limited capacity of our conscious mind; therefore, our conscious mind performs three main filtration processes namely "Distortion, Generalization, and Deletion" i.e. as follows:

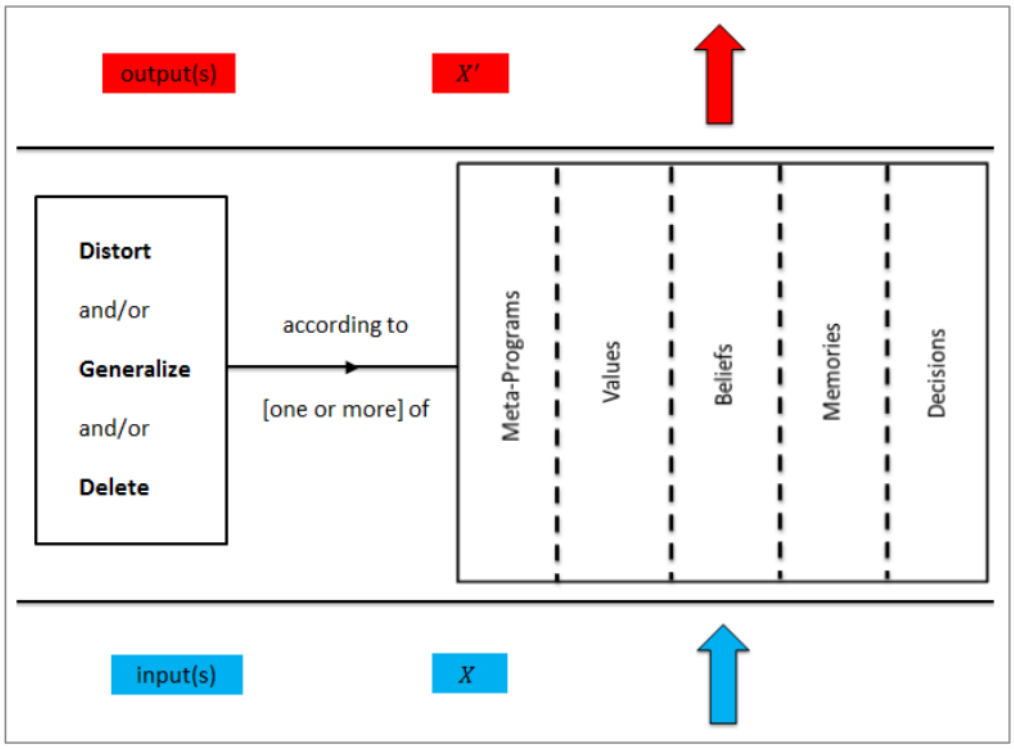


Figure 8 = how NLP works.

These three main filtration processes are done according to one or more of the above mentioned criteria. Consequently the inputs we receive from our external environment(s) are mutated from their original large bulked version $X_{(s)}$ into their filtered/mutated minimized version $X'_{(s)}$. As a result the NLP model of therapy is based on all of that fact that we are not computers in the sense that we cannot hold all of the information we are bombarded with, but at the same time we act like computers by receiving inputs that we change them to outputs and that these outputs combine together to form an "internal representation" of that certain experience which in turn form the respective "internal state" that results in a certain respective "physiology" that finally manifests itself as a certain "behaviour". Although all of this is clearly shown in the NLP-communication model shown above, I would love to convey the NLP-model of therapy by the following schematic:

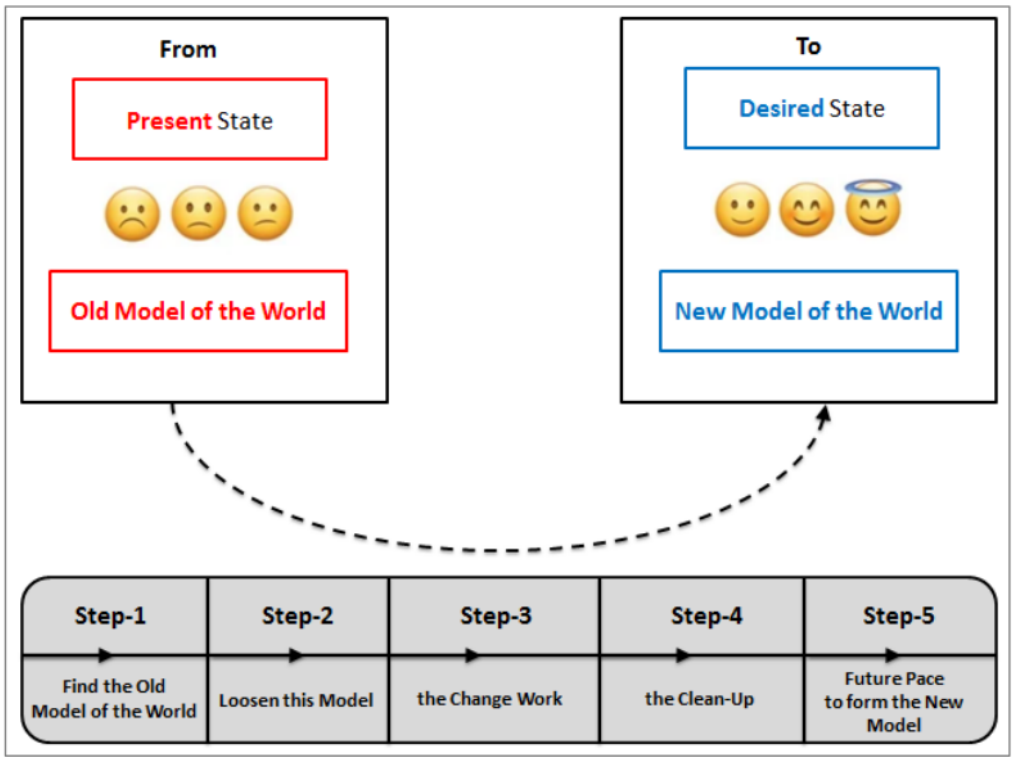


Figure 9 =NLP and the "Model of the World".

So the main added value that we see in NLP is the fact that it further details the cognitions that are done inside the human-brain into “Filters, Internal Representations, and Internal States” and the behaviour into “Physiology and Physics” thus the Mercedes Model of Cognitive Behavioural Therapy is further detailed and becomes/changes from/to:

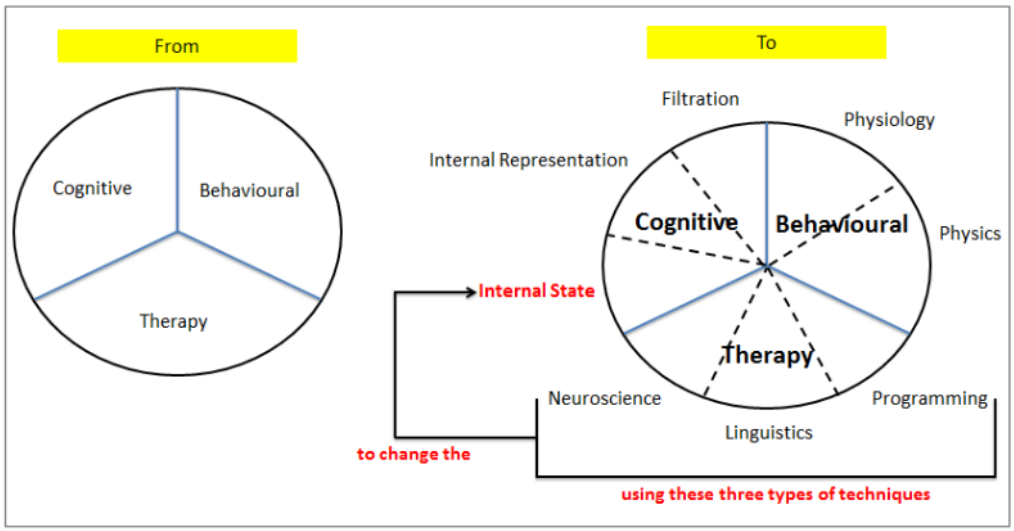


Figure 10 = NLP integrated into CBT.

Therefore NLP-techniques are nothing else but a set of scientific techniques based on Neuroscience, Linguistics, and Programming. These act as a way to change our internal state therefore changing the internal representation of everything we have experienced before and might experience in the future. This change results in changing our physiology and the physics (i.e. the behaviour itself). Another very important application of NLP is to build new states and representations that will result in better behaviours and thus better results. Now it is very convenient to state the fact that performance as defined by "any activity or collection of responses that leads to a result or has an effect on the environment" and "the behaviour of an organism (the performer) when face with a specific task"[3] can be enhanced using the theory mentioned above. In this dissertation, I will be discussing the use of a set of NLP techniques to improve the performance both mental and physical performance. The NLP-techniques I will be using are:

(1) The T.O.T.E. model for building strategies (thus habits).
(2) The Power of Values with hierarchies of priorities and change.
(3) The techniques using Sub-Modalities:

- Contrastive Analysis
- Mapping Across
- Swish Patterns
- Dissociative Techniques

(4) The use of Anchors + a brief on "Timeline Therapy"
(5) The art of Visualization vs./and Imagination

[2.3] the NLP-techniques used:

The complexity of the techniques is not the purpose of this dissertation since each one technique needs its own path of study i.e. its own dissertation. What is sought is the whole picture of the techniques and how the jigsaw puzzle of the usefulness/practicality of NLP is formed/true/valid.

(1) The T.O.T.E. model for building strategies (thus habits).

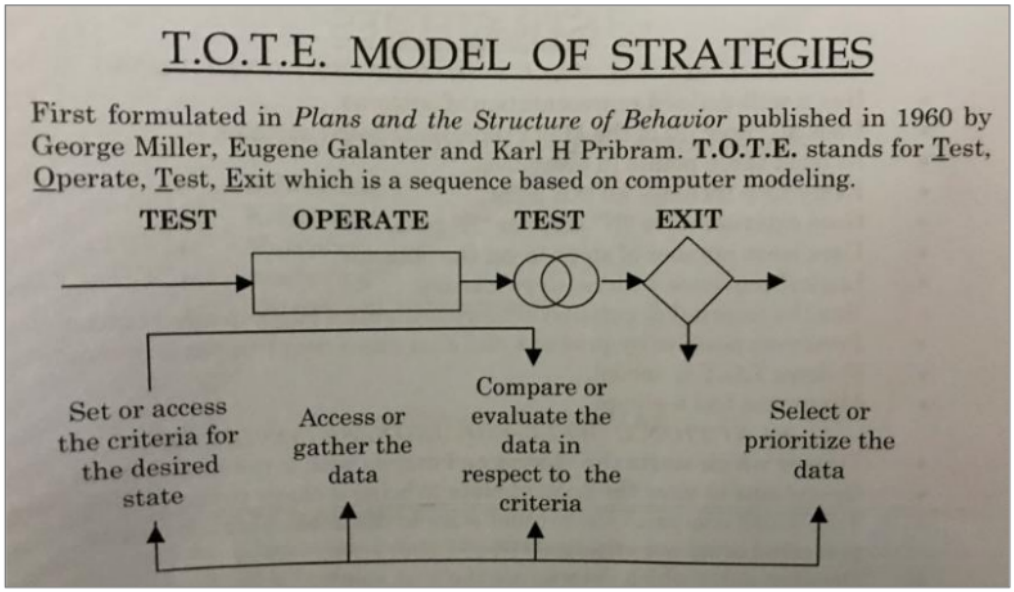


Figure 11 = what is T.O.T.E. .

As the schematic shows that "T.O.T.E." stands for Test, Operate, Test, and Exit. If we need to directly apply this performance in general i.e. both mental and physical, we will be using it as a way to calibrate and manage the energy of performance and this act as a way of milestones and improving the performance in pre-planned stages and increments over time. Taking a more specific example of performance, we will consider the goal of high intensity cycling for three continuous hours.

Test: the criteria that the athlete cycles for 6 Km(s).

Operate: the athlete cycles for 4.5 Km(s).

Test: the athlete needs to improve by cycling a further 1.5 Km(s).

Exit: next time the athlete should set the baseline of 4.5 Km(s) as an indicator (using a beep sound of a stopwatch) to cycle for 1.5 Km(s).

Now the next time to cycle, but after recovering for a suitable amount of time, the baseline of this athlete would be to run for 9 Km(s) instead of 6 Km(s). Certain variables that may change are the number of kilometers set to be accomplished in one T.O.T.E. iteration, the number of iterations to be repeated until a certain objective is accomplished, the deficit in each of the iterations to be set

as a goal in the iteration or any future iterations, the way that we motivate ourselves to cover up any deficiencies i.e. using water, energy drink, caffeine, etc…

Obviously this strategy could be used to program ourselves to perform any kind of habit in a very-systematic and gradual way. It can be used to develop behaviours that can be physical or even mental or ultimately a mix of both such as studying (and solving) mathematics for 3 continuous hours.

(2) The Power of Values with hierarchies of priorities and change.

This technique is very powerful to use when there is a lack of clearance in the vision of the athlete or when there are two paradoxical drives/motives. This technique is divided into the following 3 steps:

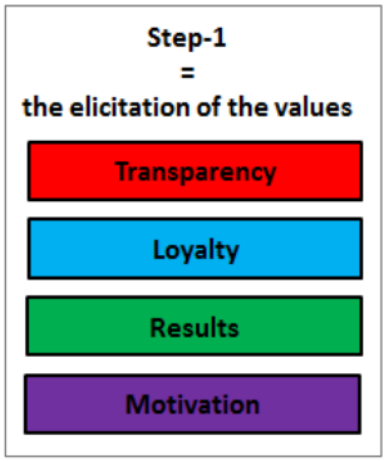


Figure 12 = the elicitation step.

This is the step where we take out the values that come out to the mind of the person i.e. this is somehow a brainstorming for values.

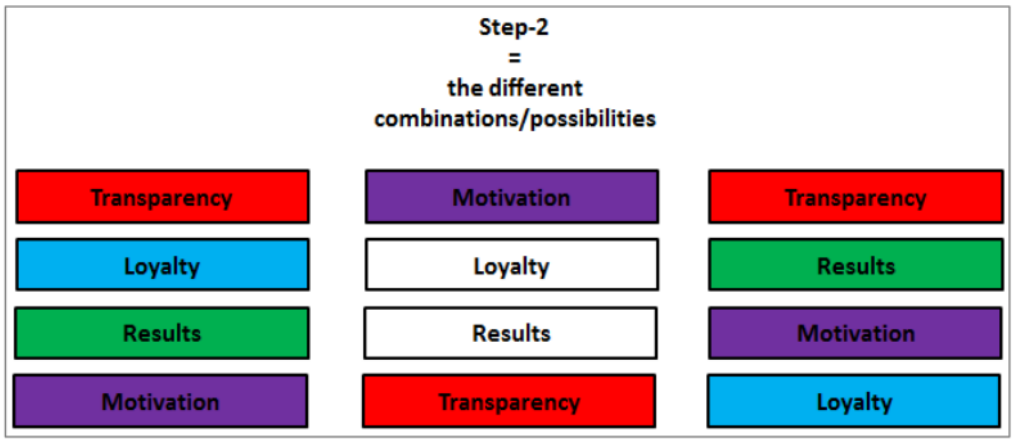


Figure 13 = the different combinations step.

This is the step where we explain to the person that the same set of elicited values can be arranged in a different set of combinations i.e. values are not those entities that can never be flexible and thus change.

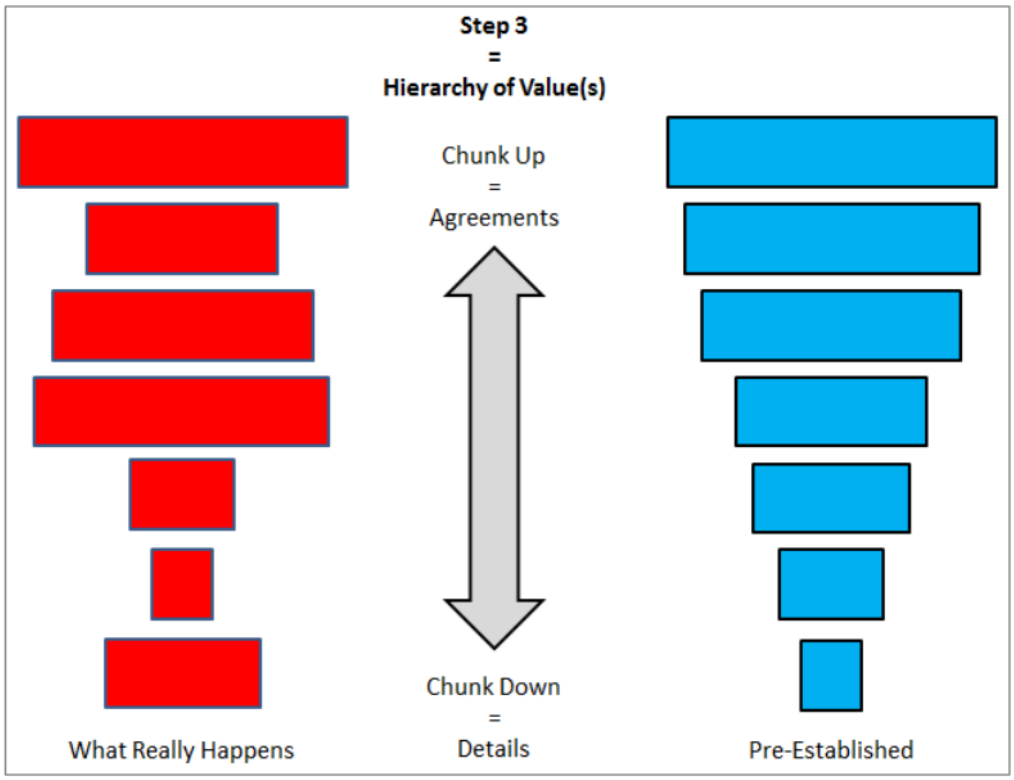


Figure 14 = the hierarchy step.

This is the step where we keep on asking questions that seek for the hierarchy of values to be rearranged in a way that ultimately looks like the blue parts. What really happens is shown on the red side and this actually happens through the following three types of chunking:

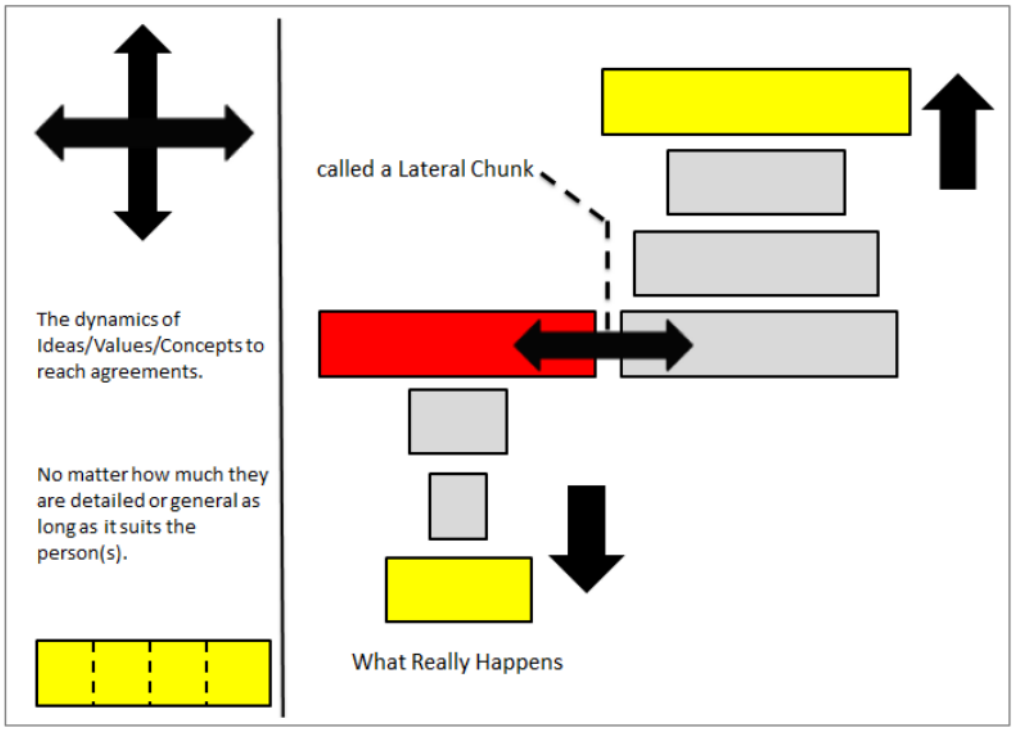


Figure 15 = the chunking of the values step.

Chunking-Up which takes us from a lower value level to a higher value level i.e. a bigger umbrella that encompasses more chances of agreements/cohesion.

Chunking-Down which takes us from a higher value level to a lower value level i.e. digging for more details that will allow for better understanding of the main roots of the ideas/feelings/motives.

Lateral-Chunking which horizontally moves between the levels in a way that allows us to find a better lower or higher alternative value.

The application of this technique, I would love to note that the solution is reached not when we as coaches/therapists decide that we have reached one of the highest or lowest values, but rather this is decided by the client when they feel cohesion of thoughts/agreements and they report that to us.

The example I will be considering is the following:

[Step-1] = the following values have been elicited “sportsmanship, competition, physical fitness, reduce stress, leadership, teamwork”

[Step-2] = the combinations are basically the same values listed in all the possible different orders i.e. as shown in step 2 above

[Step-3] = two conflicting values have been discovered which were leadership and teamwork, since the athlete believed that leadership means that they alone has to do the majority of the work towards scoring and winning. In fact this was counter-argued with the fact that teamwork dictates that the whole team performs together towards scoring or/and winning. Chunking down into the deeper meanings of leadership we could reach to a point clarifying that leadership also means to guide/drive other people to do things that serve your purpose or common goals and that one of the common goals of teamwork is to win as a whole team therefore the common ground for both of these values is the concept of competition/performing.

(3) The techniques using Sub-Modalities.

To begin with, it is very important to start with the definition of representational systems which are “the senses through which we experience the world” then moving to the definition that sub-modalities are “the fine distinctions/qualities we make within each representational system/sense”. Therefore, and as example, for the auditory representational system the fine distinctions would be the {Timbre, Rhythm, Volume, etc…}. We use sub-modalities to easily change the client’s internal representations because in doing so, we change the state(s) of the clients thus their physiology(ies) and the related/resulting behavioural or/and mental outcomes.

Note that we have two types of preferred representational system which are:

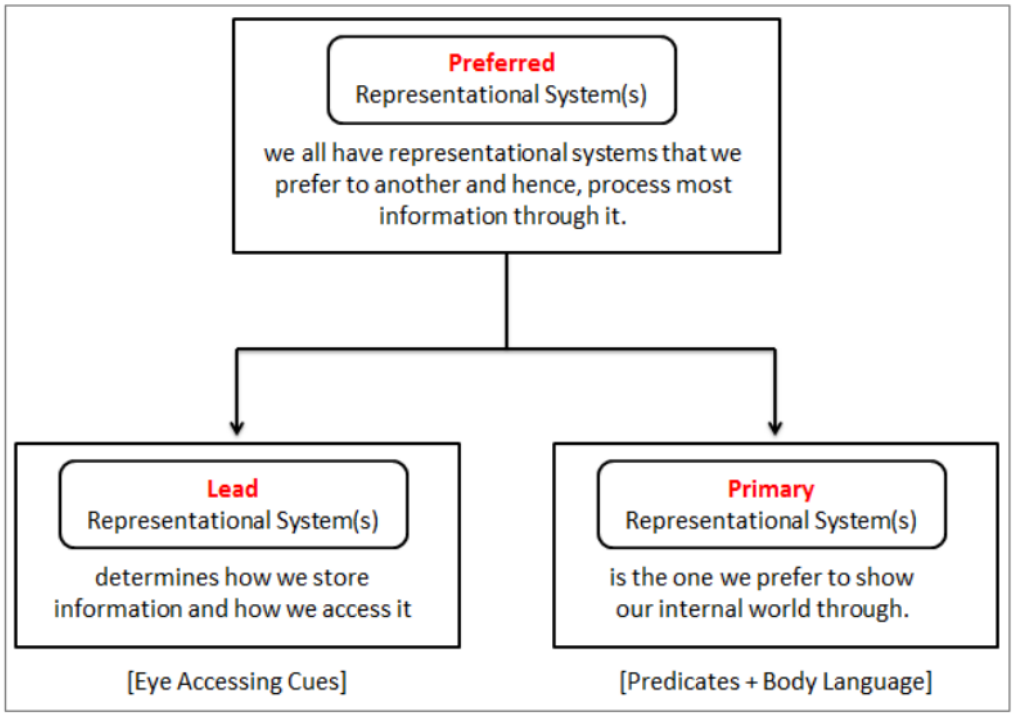


Figure 16 = the classification of representational systems.

Furthermore, the sub-modalities of each of our experiences are unique thus resulting in a unique internal representation. This is very much similar to the concept of the human fingerprint where it is impossible for two people to have the exact fingerprint. Another metaphor that could be used to describe such uniqueness is the barcodes under the items in a supermarket.

Before we start with the philosophies of the techniques used, it is important for us to understand that internal representations are a mix of all of the VAKOG+AD (i.e Visual-Auditory-Kinesthetic-Olfactory-Gustatory + Auditory/Digital) modalities and thus by fine-tuning/calibrating their sub-modalities we are able to change the relevant internal representations. In what follows, I will be directly stating the name of the technique then its dynamics schematically then I will state a brief example on the use of this technique:

- Contrastive Analysis and Mapping Across

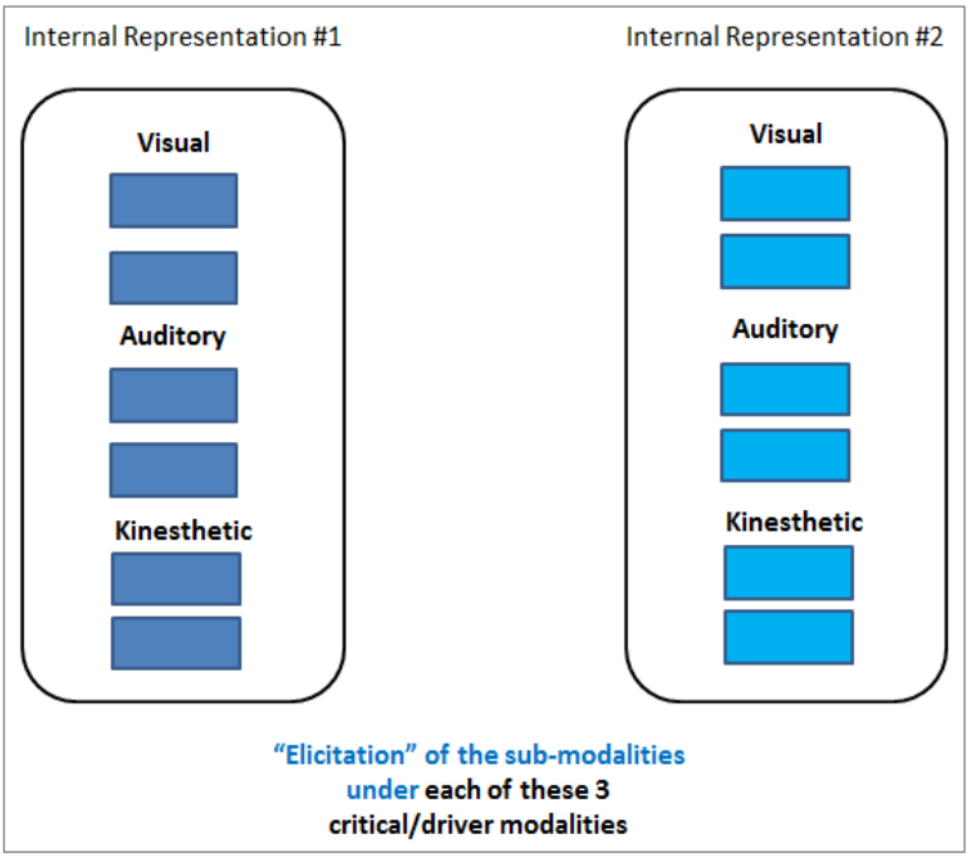


Figure 17 = elicitation of the sub-modalities.

This is the first step in this technique which is to elicit the sub-modalities of each of the two international representations then comparing them to each other i.e. this is the contrastive analysis.

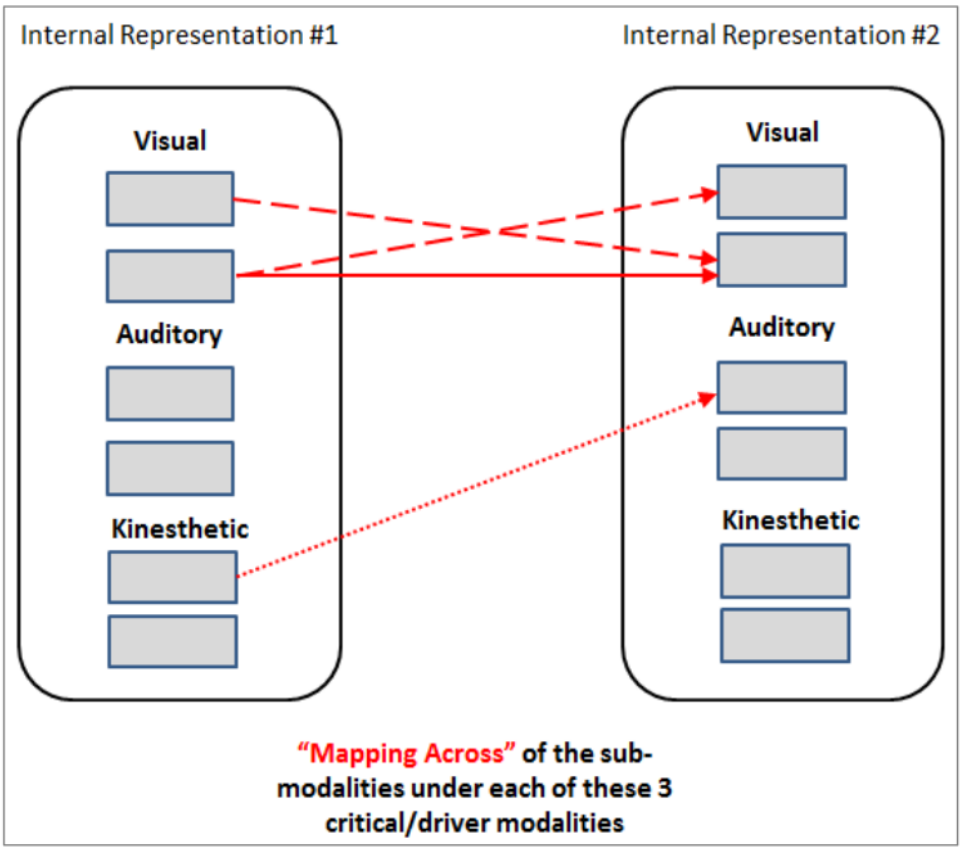


Figure 18 = the mapping across of the sub-modalities.

The next step comes in the mapping across i.e. the two-way changing of some of the sub-modalities such that each of the internal representations is changed, but not totally. This is used when we want to map something that we dislike to something that we like; therefore, lowering the degree of disgust from that which we do not like. A direct example would be that of yogurt and a strawberry-milk shake.

- Swish Patterns

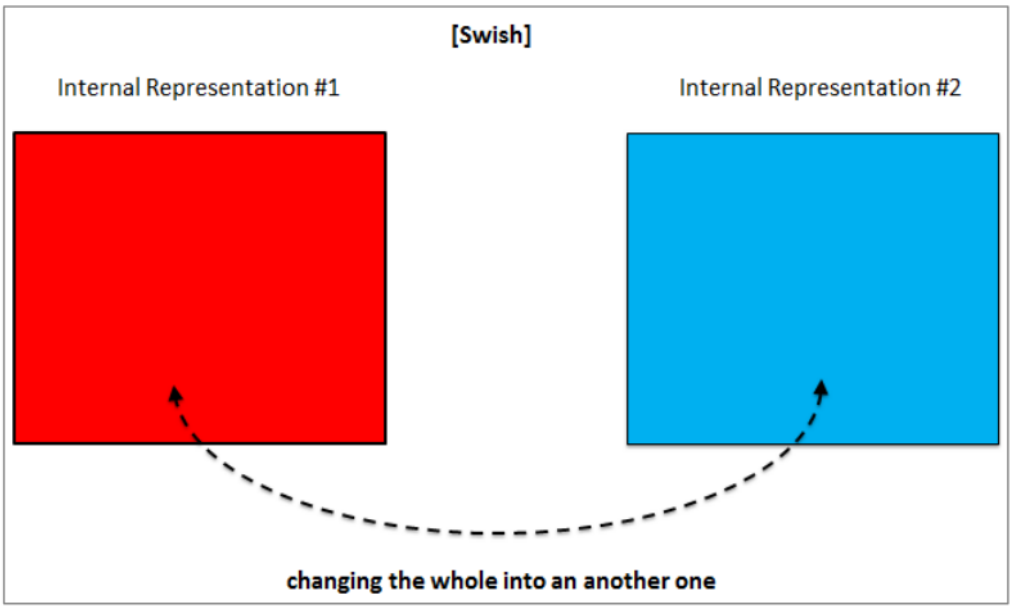


Figure 19 = the SWISH pattern technique [1].

This is a technique that can be used to switch one whole unwanted internal representation into another whole wanted one. This can be used very powerfully with strategies when there is an internal representation that hinders the sequence of events in a certain strategy i.e.:

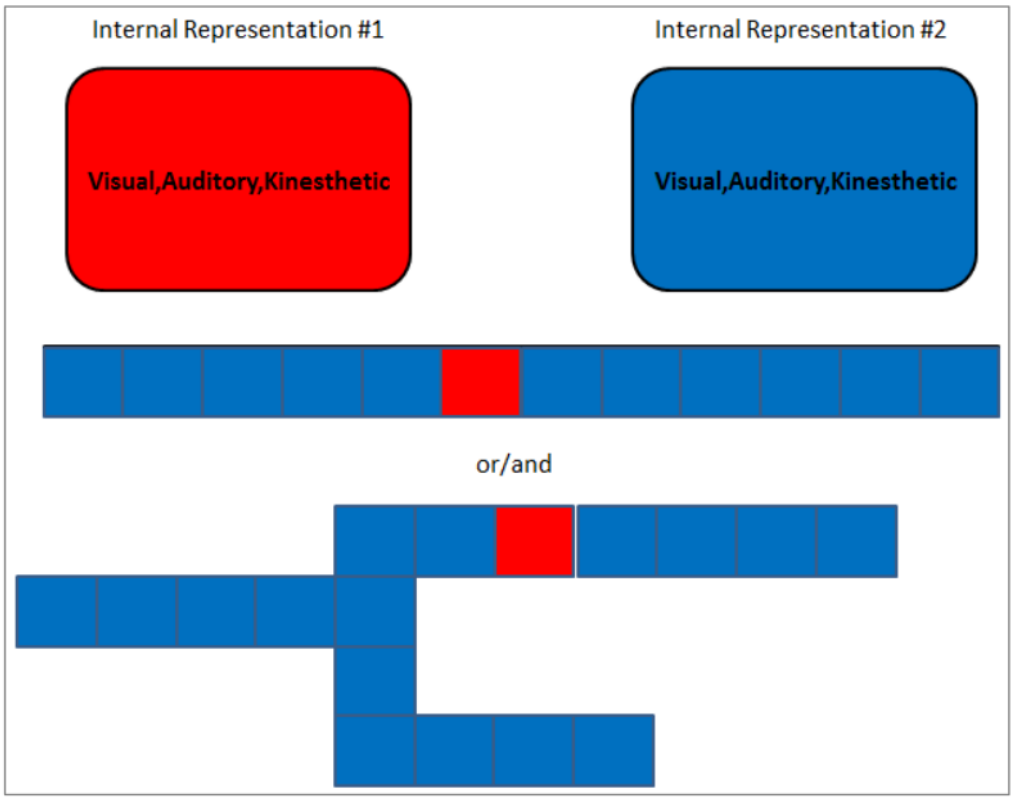


Figure 20 = the SWISH pattern technique [2].

An example would be that a certain person wakes up in the morning then wake up his family and prepares breakfast to eat before brushing his teeth and leave to work. This is a daily pattern (i.e. strategy) that gets interrupted whenever he eats eggs in the breakfast since he feels disgusted from the smell and the residues of eggs in his mouth while brushing. Then the solution would be to work on the smell and image of eggs (i.e. this egg's internal representation) such as changing the smell of the eggs to strawberry and the crushed white eggs into ice and mango.

In case the whole internal representation is not to be shifted as a whole, then we can change any one of the sub-modalities in any of the representational systems as follows:

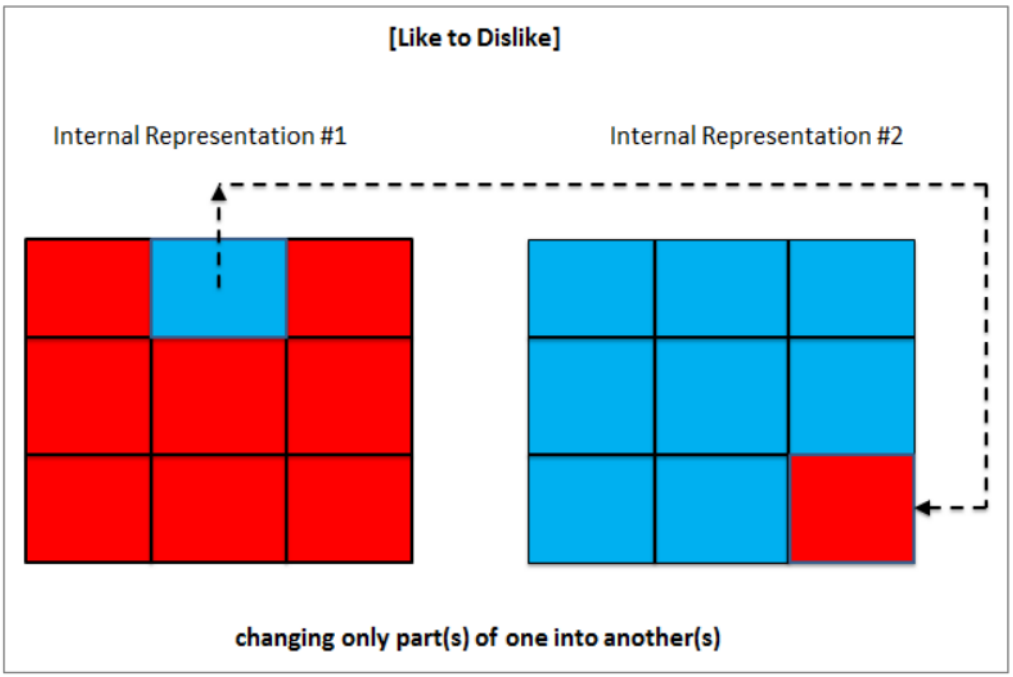


Figure 21 = changing the like to dislike.

- Dissociative Techniques
  The most common technique is the "dissociation/association" technique which is to take oneself from the associative state inside the experience to that of the dissociative state outside of that experience. In a diagram this would be:

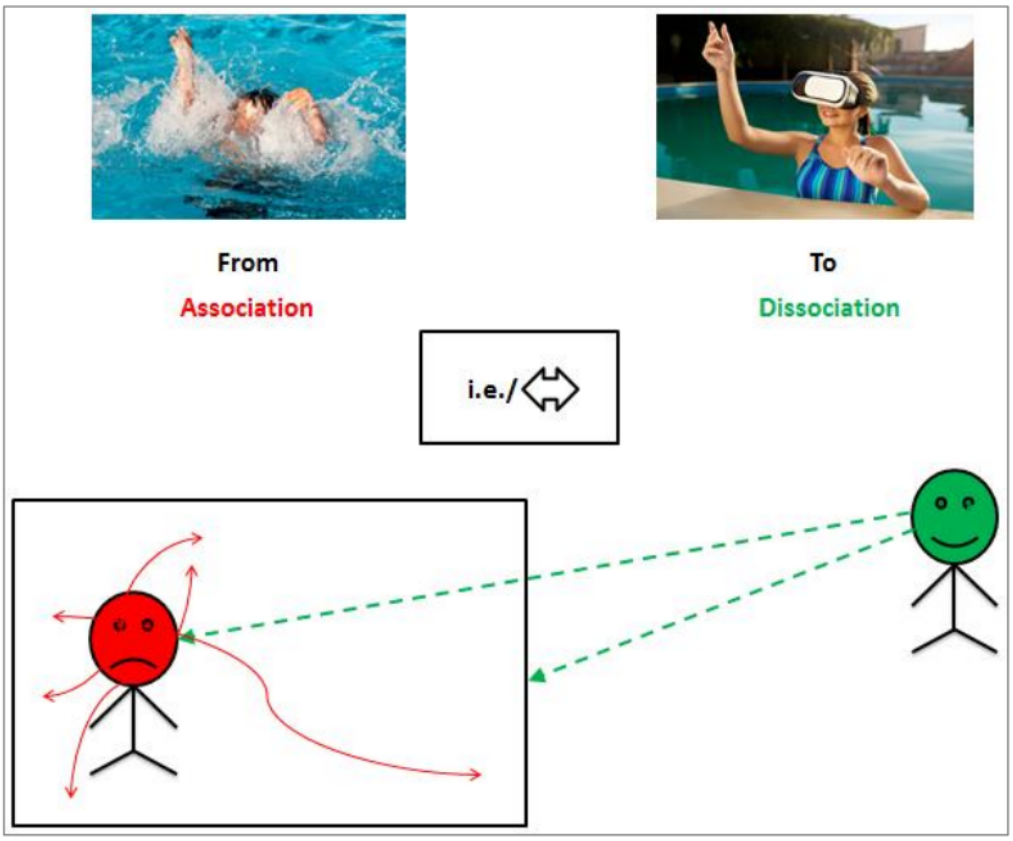


Figure 22 = association and dissociation.

This is very close to a the change of perspective approach (also known as reframing) and also very close to the simple idea of zooming-in and zooming-out to better view the situation (also known as focal and peripheral visions). The difference in this specific technique lies in the separating of one's self from the feelings, thoughts, identity, etc… and sub-modalities of the experience itself thus watching the experience from the outside view of a neutral observer rather than someone immersed fully in the experience's internal representations (whether them being positive or negative).

(4) The use of Anchors + a brief on "Timeline Therapy"

Anchors are defined as "The NLP Technique whereby a stimulus is linked to a response. An Anchor can be intentional or naturally occurring." This technique is extremely more powerful when this stimulus is intentionally done and is linked to the concept of rewards. An example would be drinking an energy drink during the sub-phases of a long high-intensity endurance training (i.e. the T.O.T.E. above mentioned example on cycling). In addition it is very important to distinguish between the different types of anchors and when each of them is used. There are 5 types of anchors:

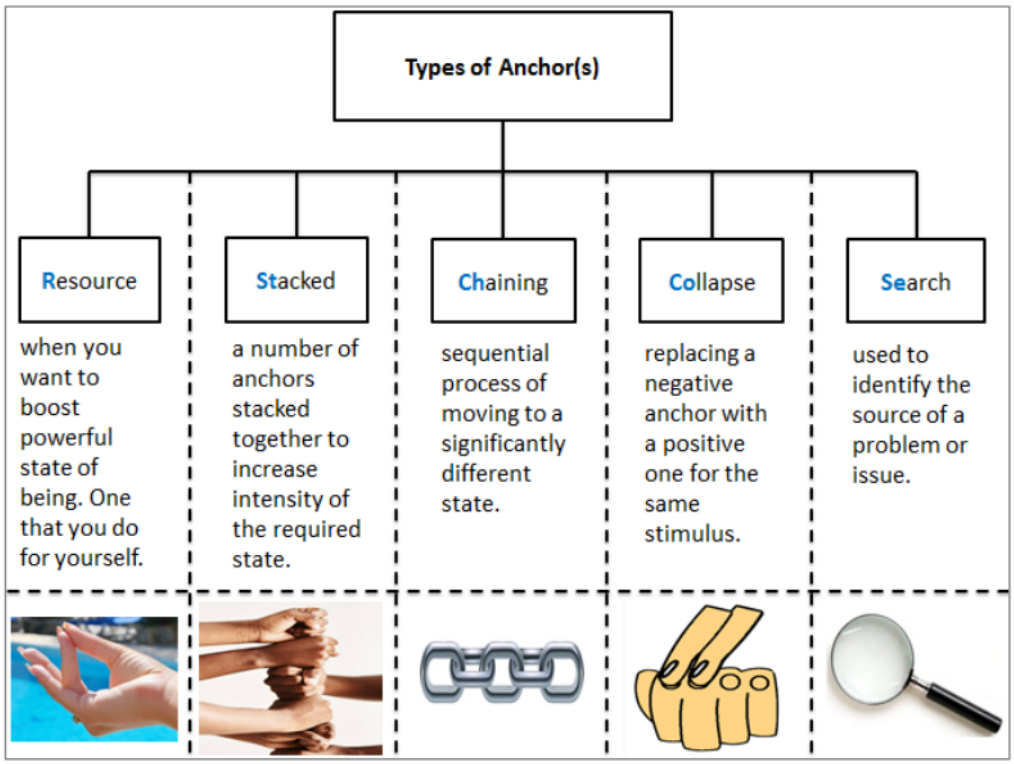


Figure 23 = types of anchoring.

In what follows I will be detailing an example on each of the five types of anchors:

- Resource Anchor: touching the knuckle of the right hand (the dominant hand) at a time when you felt very confident.
- Stacked Anchor: the same as the above mentioned resource anchor but for multiple states together i.e. a time when felt powerful, together with a time that you felt loved, and a time that you felt courageous.
- Chaining Anchor: the best used example is from procrastination to motivation. This is done by having two intermediate states i.e.as follows:

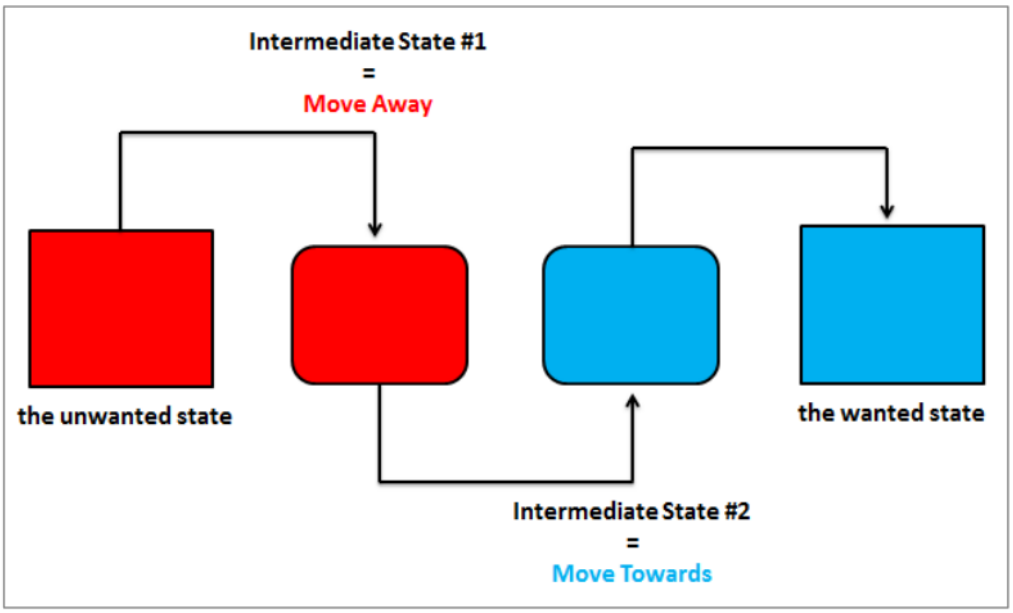


Figure 24 = the philosophy of chaining anchors.

The unwanted state is procrastination, intermediate #1 can be confusion, intermediate #2 can be anticipation, and the wanted state is motivation. Note that each state is anchored on the knuckle of a different finger and the four anchors done on consecutive four fingers.

- Collapse Anchor: it is a process by which we reinforce the positive state and let it take over the/a negative state it being a minor negative state, for example, frustration and not anger. I will not describe this process in details nor draw any schematic for it, but will feel enough to say that the main philosophy behind it is to reinforce the power of the positive state so much (also stacking appositive anchors can be used) and diminishing the power of the negative minor state by holding the anchor for less number of times and less amount of time.
- Search Anchor: again it will be enough to mention that its philosophy. In this type of anchor we are searching for the original source of the positive state by going back in time and finding the older anchor one by one then breaking state after each one until we reach the oldest one.

This last type of anchor will take us to the concept behind "Timeline Therapy" which was developed by Tad James and is a very powerful therapeutic technique. Its main philosophy lies in the fact that what constitutes time for us as human beings is not the counted mathematical time we perceive in our everyday clock, but rather real time is the time of emotionally high memories and by anchoring these instances at their peaks would create milestones that are closed linked to each and thus forms a unique timeline for each client/person/athlete/etc… Drawing that in a diagram this would look like:

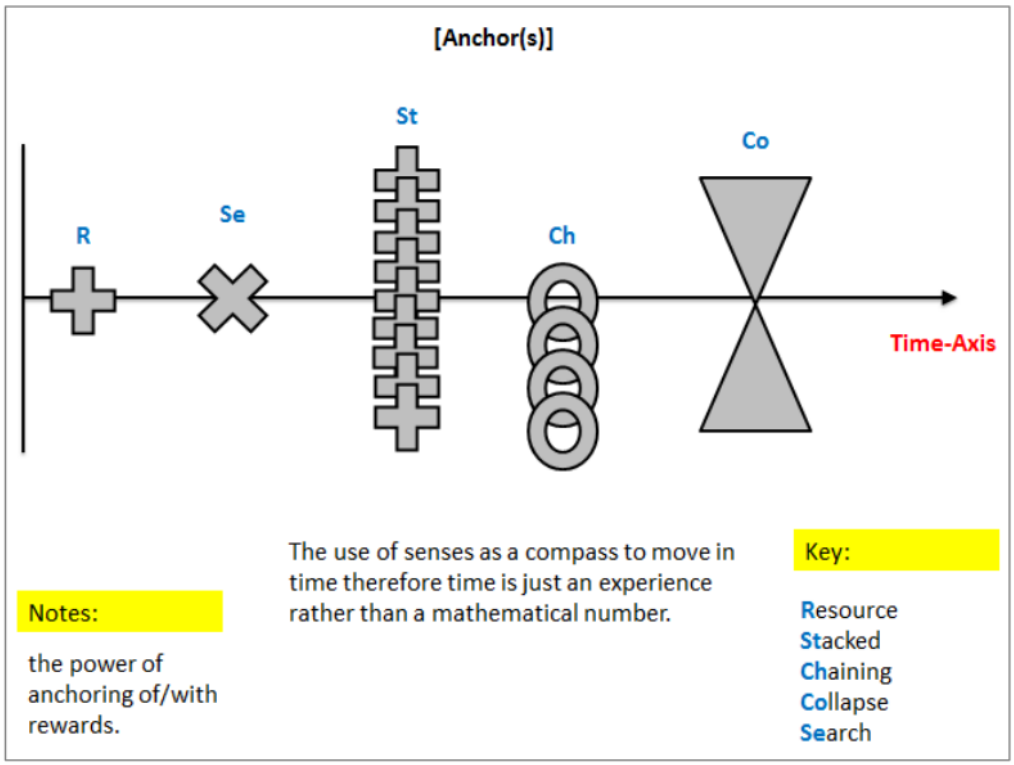


Figure 25 = anchoring and our timeline.

Note that whenever any state's internal representation is to be elicited, we use the same elicitation checklist:

Sub-Modalities Checklist

		1	2	3	4
Are there any pictures that are important?	**Visual**				
	Black & White or Colour				
	Near or Far				
	Bright or Dim				
	Location				
	Size of Picture				
	Associated / Dissociated				
	Focused or Defocused				
	Focus (changing/steady)				
	Framed or Panoramic				
	Movie or Still				
	Movie-Fast/Normal/Slow				
	Amount of Contrast				
	3D or Flat				
	Angle Viewed From				
	# of Pictures (shift?)				
Are there any sounds that are important?	**Auditory**				
	Location				
	Direction				
	Internal or External				
	Loud or Soft				
	Fast or Slow				
	High or Low (pitch)				
	Timbre – clear/raspy				
	Pauses				
	Cadence/Rhythm				
Are there any feelings / tastes & smells that are important?	**Kinaesthetic / Tastes / Smells**				
	Location				
	Size				
	Shape				
	Colour				
	Intensity				
	Steady				
	Still/Moving				
	Fast/Slow				
	Humidity (dry/wet)				
	Vibration				
	Hot/cold				
	Pressure (high/low)				
	Texture (rough/smooth)				
	Heavy/Light				
	Internal/External				

Figure 26 = the sub-modalities elicitation checklist.

(5) The art of Visualization vs./and Imagination.

The first and most important thing is to know that Visualization is not the same as Imagination; therefore, I would like to distinguish between the two as:

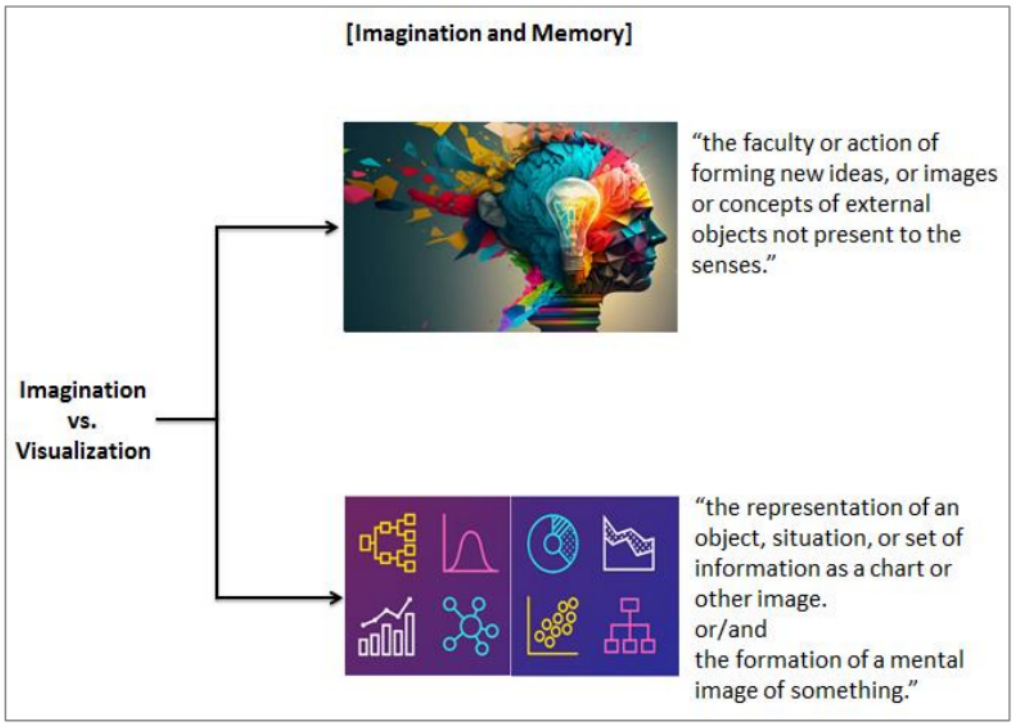


Figure 27 = imagination vs. visualization .

Now considering an example that we have used in the early beginning of this dissertation when we defined NLP using three interconnected/overlapping circles denoting the fields of "Neuroscience, Linguistics, Programming" this in fact was a data visualization tool known as the "Venn Diagram" and it is defined as: "A Venn diagram uses overlapping circles or other shapes to illustrate the logical relationships between two or more sets of items. Often, they serve to graphically organize things, highlighting how the items are similar and different."

In comparison to the Imagination technique, which is kind of the inverse of visualization, since it generates objects/ideas/images/etc… that are not present in our senses. I will consider the example of Imagination through my first exercise in this thesis which is the first exercise considered below.

[2.4] the Exercises used

(will also be adopted for my quantitative descriptive analysis - below).

[2.4.1] Exercise #1 = The Power of Imagination.

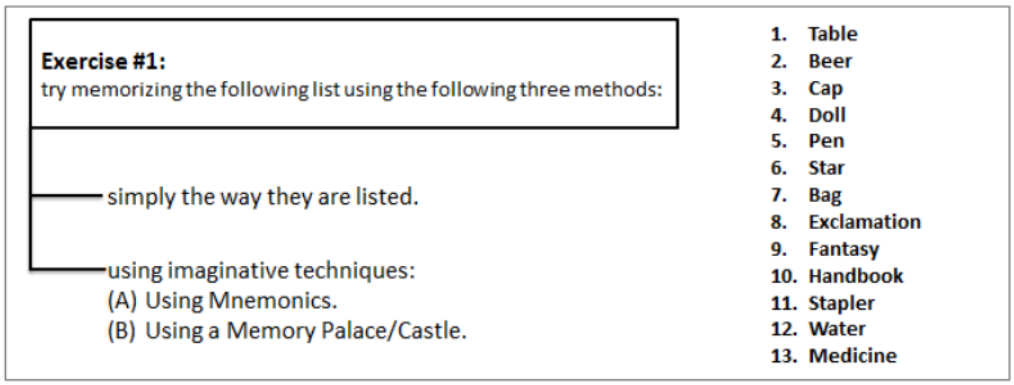


Figure 28 = exercise #1.

The most interesting thing to start with is the quote by Sr. Albert Einstein "Logic will get you from A to B. Imagination will take you everywhere." Now, in my humble opinion, the secret to success is the wise/smart combination of both imagination and logic (the latter actualized by Programming). In fact I deeply believe that the ultimate secret of the success of the NLP-Modality is that this modality is the combination of the three fields of [Neuro-Science, Linguistics, and Programming] which definitely encompass logic and imagination (in addition to science and even philosophy !!) as compared to other therapeutic and learning modalities, just to name one, Cognitive Behavioural Therapy.

Two of the most common and powerful tools of imagination are "Mnemonics" and "Memory Palace". According to the Oxford English Language Dictionary, Mnemonics (as a field of study) is "the study and development of systems for improving and assisting the memory." In addition the word "Mnemonics" can also be used to refer to the tools/techniques/systems used to improve and assist our memories.

Considering any of the definitions above, it is very important to consider four main fields in the science of memories: (1) the study of the systems (2) and the development of the systems (3) the aim of improving the memory and finally (4) the aim of assisting our memories. Out of these four sub-fields, we will be focusing only on points 3 and 4 simply because they are inclusive to the other two remaining points. In addition, of course, our focus will be on how NLP techniques (i.e. systems) will improve our memories. As a matter of fact, I will be using the Linguistic Technique of Acronyms in combination with the Neurological Technique of Imagination, both used in a systematic way that forms a certain algorithm that is just the exact thing what the Programming field of science offers to us.

Whereas the "Memory Palace" technique is defined as "a memorization strategy, based on visualizations of familiar spatial environments to recall information." It is also called the loci method and the word loci is the plural of the word locus which a Latin word meaning locations/positions/places.

We are going to start with the method of Mnemonics where we will be using acronyms.

The form of acronym I suggest is an imaginative and programmed form of acronyms. The imaginative component lies in the fact of using one or more of the following techniques:

[1] can the shape of any letter be transformed to another one or more letters

[2] can we in anyway link the number of the bullet point to any of the letters of the relative word most preferably the first letter if possible.

[3] can the letter be transferred to another form of "linguistics" i.e. a picture, a word, a sound, etc… that serves better in memorizing the item.

The programming component lies in:

[4] do any of the letters follow each other alphabetically

[5] do we have letters that are repeated

[6] set up certain colours for each category of the letters above including those that are a combination of any of the above

Now we will go through a guided practice for the sake of explaining this method:

[Step One]

Write the first letter of each of the items in the order that they appear. Note that the larger the letters and the more distinctive the letters appear, the easier it is for the participant to memorize them (specifically when the person is visual).

[Step Two]

Colour those letters that are in increasing alphabetical order and note that the red colour is on of the best choices as it triggers the alert state in our minds (plus be consistent in your choice of clorous). The alert state increases our attention ability because it gathers/mobilizes the necessary resources for better/optimal memory performance.

[Step Three]

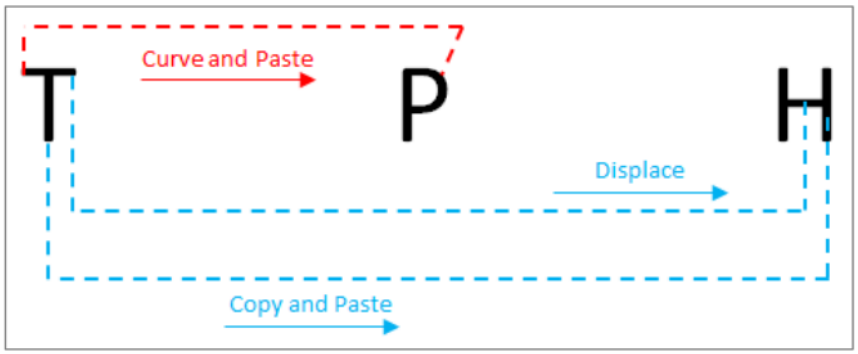
Colour those letters that are repeated an those that are both alphabetically arranged and repeated should be coloured differently too

[Step Four]

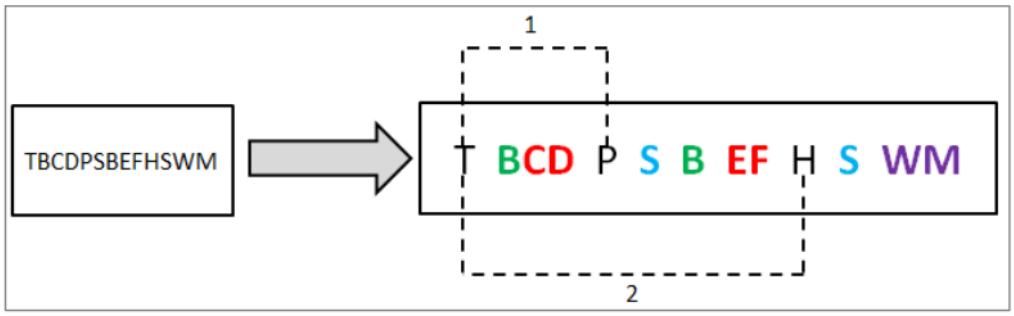
Colour those letters that are variations of each other.

[Step Five]

Those letters that are not coloured represent those left out, but definitely they can be memorized easily by categorizing them as “left-outs” and/or by linking them in any possible ways. Here it is obvious that the left-out can be linked by geometrical variations:



Finally, we have transformed:



Notes:

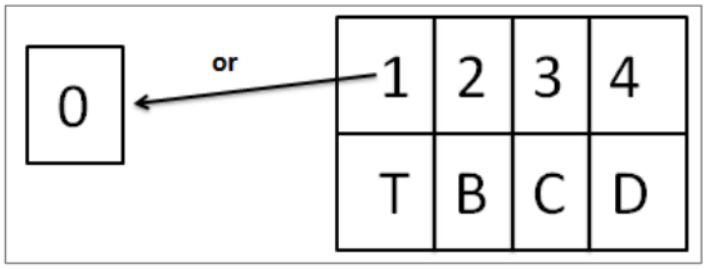
[1] this method (all of these steps) are used to memorize a list of items written in the English Alphabets, but definitely it can be used with any other language(s).

[2] although this method is designed to memorize lists that range between 10 to 20 items, this is definitely true as a primary stage since each person/participant/candidate will be developing their own database of letters and their respective coding(s); therefore, the secondary stage will be that of using this unique database to increase the size of the data that this method can be applied to.

To clarify this point, let us state that the database will be related to the existentialist journey of each candidate thus it will personally "customized and tailored" by the candidate in a way that suits them, for example, it is easier for one candidate to imagine rotating an "E" 90° anticlockwise to form a "W" while another candidate finds it easier using a 180° rotation of an "M" to form the same letter "W". Another example will be that the same letter "T" can be visualized as him playing tennis with his girlfriend at the beech-club, while another would compress that letter to the small version i.e. "t" thus visualizing himself playing table-tennis with his friend at the college's lounge.

[3] all the colours chosen and all of the patterns (being geometrical or not) discovered also depend on the candidate's preferences.

[4] one technique that are used by programmers is to create an (dummy/imaginary) index number that is placed over each of the letters therefore makes this another form of patters/modalities discovered/formed that help memorizing the list of items. In addition, some the list with the respective indices are as follows:



[5] the candidate can be creative in anyway since imagination has no limits and one of the examples is linking the letters to each other using (adding) the colours of their indices, while others might link the indices to the small-letter version of certain letters then decode them again to form the needed ones i.e. the larger-letter version of these letters. Finally, and another example can be, using the sounds of the letters themselves or any of the words they are included/involved with.

[6] the preference of the certain methods that form the database of each of the participants definitely depends on the "preferred representational system" (also called the primary representational system) of the candidates and NLP-detection methods for these preferences is definitely to be utilized here.

[7] as mentioned on point #2-above that there are more than one stage in memory development and now the third stage will be to practice the method using the personal database and the more practice is done, the better the performance becomes where the word "better" simply means more items memorized in a lower amount of time with a lower error in performance.

As it is said "practice makes perfection" and I would love to add that perfection creates mastery and mastery creates creativity (and innovation).

[8] As we are talking about mastery, it is very important to state that the mastery of this method is just the same as the mastery of any other skill, but I would love to specifically mention the following 2 very important (and very similarly related) skills:

- the keyboard example: we all remember the first time we have been exposed to the keyboard. We remember that we were searching for the letter to be typed one letter at the time and using only one hand. Definitely the searching time was around 5 to 7 seconds to reach each of the letters. Now as we practiced (i.e. typed) more and more, we started finding the letters on the keyboard much faster then at a higher level we also started typing using both hands which dramatically made us write super much faster and faster. Finally reaching the creativity stage when we could type without even looking at the

keyboard !! Yet the performance can increase more and more without looking at the keyboard anymore.

- the example of UCMAS: UCMAS stands for "Universal Concept of Mental Arithmetic System" and it is a set of techniques/skills that allow the person to compute numbers (including fractions and numbers) at a very high rate and with shocking accuracy too !! The process for such performance also passes through the above mentioned stages , but of course in a different context. At the very early beginning, the student is introduced to the [abacus] which is "a hand-operated calculating tool which was used from ancient times in the ancient Near East, Europe, China, and Russia, until the adoption of the Hindu-Arabic numeral system." The student practices on the abacus the same exact way done using the keyboard until finally operating mentally by visualizing the abacus and using only the fingers as a way to guide the imagination of the numbers i.e. without physically using the fingers on the physical abacus.

[9] in fact both of the examples mentioned above are based on the psychological fact of how "the conscious and unconscious competency" is developed, which is can also be applied to competencies like tying your shoelaces, driving your car, or even writing with your non-dominant hand until it becomes a dominant one !! This competency development is coded as follows:

Noting that this is nothing else than an NLP technique. This is so because repetition of the skill means that the neurological path is being repeated and strengthened from one attempt to another. In addition, these repetitions follow a certain expected forms of development which is just the philosophy of programming. Finally the syntax of the languages used is the linguistic part of the technique i.e. the sounds, images, etc… that enhance the development from one point to another.

[10] another coding can be used which is of mathematical nature. One of them can be for example the power-code i.e. B^3 which means that B is repeated three times. Another example can be the use of τ(---) or/and etc…. Where each can be set to be meaning a specific personal/tailored meaning (i.e. for each participant).

[11] finally it is very important to state that everything can be personalized/tailored by the memorizer i.e. the colours, fonts, line types, effects used, etc…

Now we will be moving to the design of the Experiment (when applied at the research methods section):

[Phase One]

the 1st attempt = the baseline attempt:

the participant will be self-discovering their own way of memorizing the list, then we

definitely note the time taken to do so with the consequent score made.

the 2nd attempt = the learning attempt:

the participant will be taught in details the techniques mentioned above and then they will re-attempt the list thus comparing the performance before and after.

the 3rd attempt = the performance attempt:

the participant will optimally practice the techniques learned.

[Phase Two]

the participant is triggered to generate a list of his own inputs regarding the used of each of the 6 components/tricks mentioned above thus building a personal (tailored) data-base that can be used for any other different list i.e. than the one practiced already.

[Phase Three]

the participant is subjected to lists that are selected at random from an already existing/created database where certain metrics/descriptive statistics for the general population were already formalized/calculated.

Now the following exercises are to be given to the participants before solving the previous/first two exercises and then after solving them, such that we can detect the effect(s) that NLP has on critical thinking and thus the improvement of the participant(s) i.e. a $\Delta_{after-before}$ analysis.

Method 2: the use of “Memory Palaces” also known as the “Loci Method”

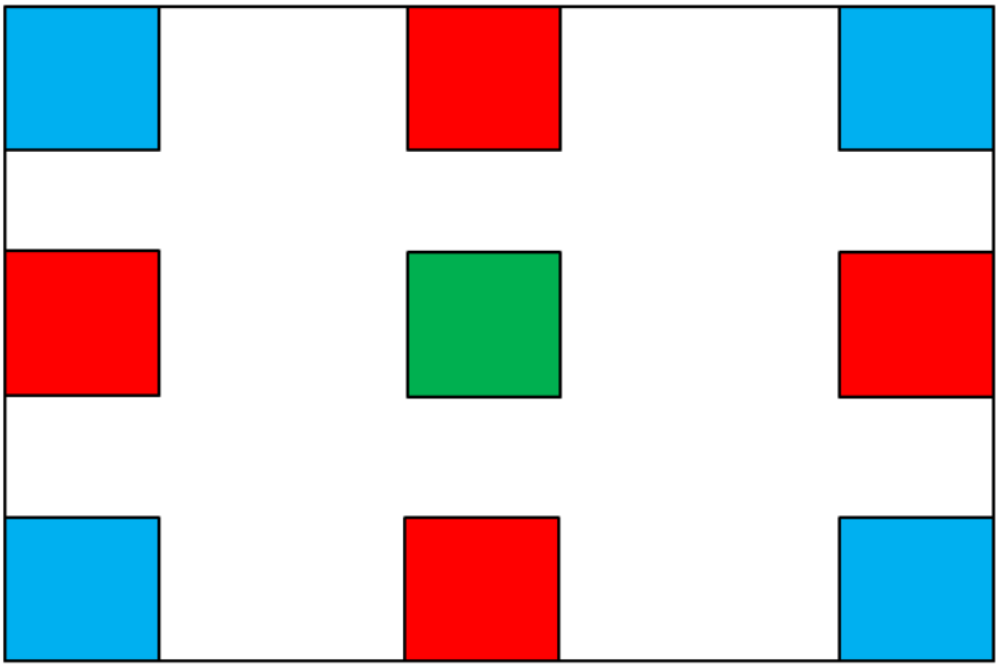
A Memory Palace (also known as a Memory Castle) is an imaginative structure that is made up of a very familiar place to the person and where memory images are placed in.

For example, one’s own bedroom can be the palace and usually the corners (i.e. the four) and the centre of the room are used as primary locations to place the images then layers, secondary, over these locations are also used to save extra images. In addition and being more systematic, all the images are accessed in a united convention/order for example a clockwise manner. Finally it is important to link the images through a combined narrative, story, logic, scenario, animation, dynamics, etc… such that they are easily memorized.

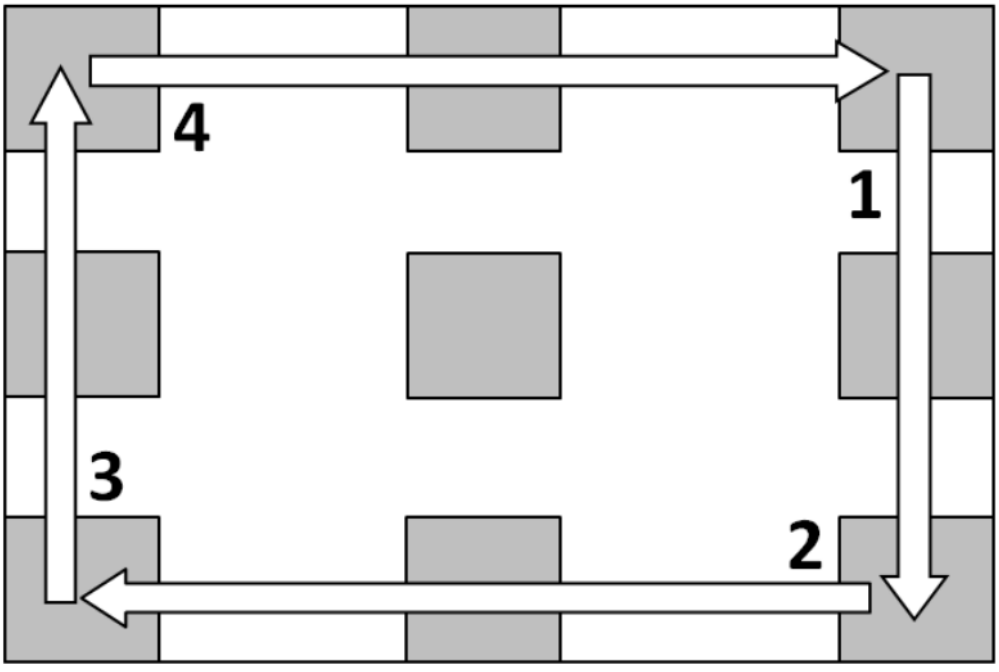
These steps are applied to the same list of items that we have from before:

Step 1: Choosing the imaginative physical location and its sub-locations.

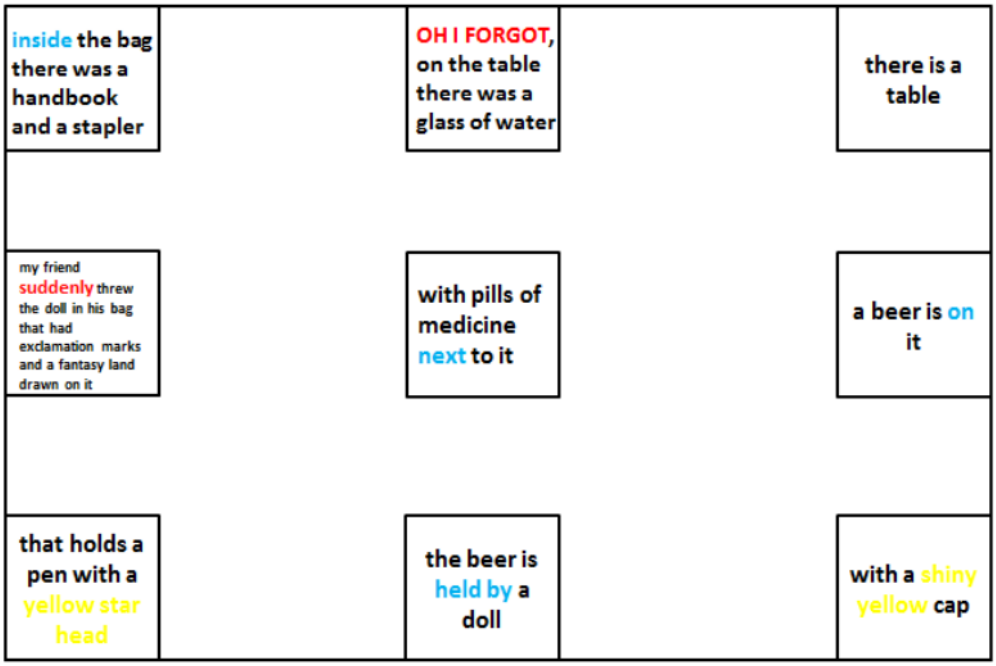
In this step we are choosing a real physical place that is very familiar to us, for example our bedroom, and inside which we are choosing the sub-locations to imaginary place the items in them. Since we have a list of 13 items then the four corners (i.e. the blue ones) of the room will not be enough and therefore we will add four more midpoints in-between (i.e. the red ones) and one centered location (i.e. the green one). All of these are as follows:



Step 2: Choosing the starting point and the convention of flow.



Step 3: linking the items using a video-like story.



Notes:

[1] the more familiar the physical locations chosen, the more the effectiveness of the memory palace.

[2] maintain the same starting point preference, angle of perspective (i.e. side-view, top-view, etc…), and convention of flow as this systematic approach strengthens the recall of the items.

[3] although it is hundred percent possible to remember this list of thirteen items using the dynamics of the table and the items on it by their own i.e. without using any familiar physical place to link the story to, but this becomes harder and harder when we use multilayered stories i.e. when we use the same physical location to denote two layers of two stories and this happens when we have a much higher number of items (for example 26 items).

[4] the details of the linking story act as a strong bond for all the items and some words, colors, terms, and actions can act as "enhancers" for these bonds. Some examples that were used are: (1) the yellow shining color of the cap (2) this color also served to imagine the star-head of the pen that is held by the doll (3) the term suddenly induces exclamation that was linked to the bag and in turn linked to the term fantasy (4) moving from the outside labels of the bag to what the bag contains from the inside also strengthens the plot (5) then the similarity of the nature of the items present inside the bag is also a great bond and finally (6) "OH I FORGOT" using capital words denotes attention and (7) the latter statement itself acts as a shock and takes us back retrospectively through the story.

[5] noting that generally:

(1) the more coherent the story is, the more efficient the recall will be.

(2) the greater the number of enhancers, the more effective the recall will be; provided that, these enhancers are inserted wisely (i.e. only when needed).

[6] again and again, everything that has to do with imagination is subject to tailoring and change depending on the preferences of the imaginer; therefore, one other example of such a preference would be sarcasm which is used to link items in a story, but more effectively when memorizing names of people (linked to a feature in their face, hair, or/and character).

[7] lastly it is important to practice:

(1) the physical locations of the memory palace while being empty and this enhances the basis for placing the story's items in them.

(2) mentally linking different items using different stories and this will enhance the imaginative capacity of our brains

(3) bonding multilayered stories i.e. as an indirect way of exercising the two above mentioned points/enhancers.

[2.4.2] Exercise #2 = The Power of Neuroscience and Programming.

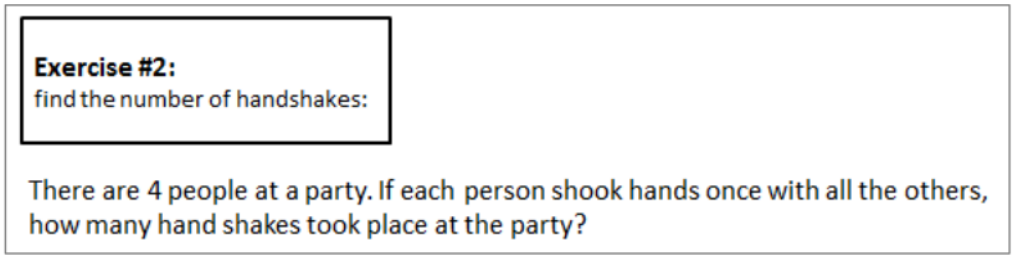
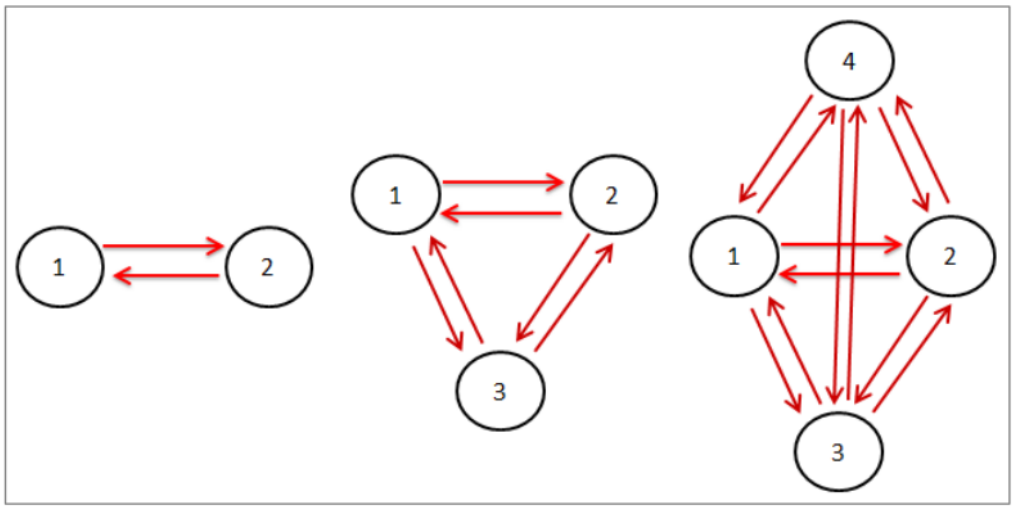


Figure 29 = exercise #2.

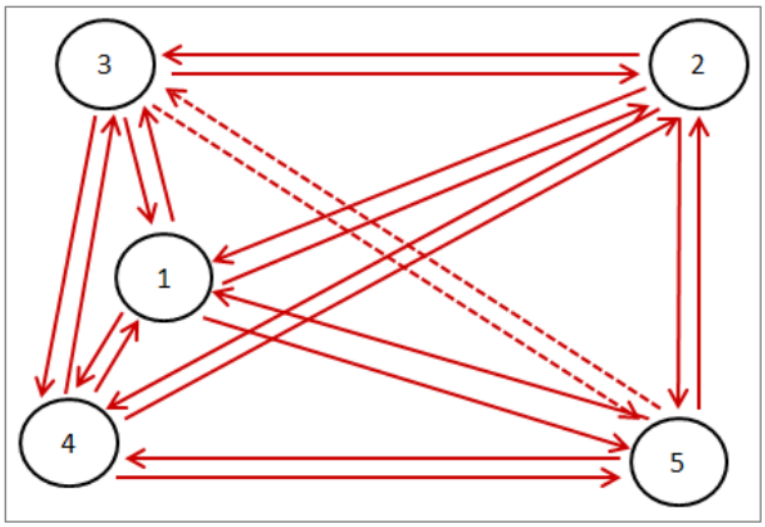
[Phase One] = the prototyping phase:

The candidate will be drawing the first three schematics such that they start to discover a pattern between the number of people and the resulting number of handshakes made in the party. Definitely, the candidate will also analyze that each two arrows between each pair of nodes represent just one handshake i.e. not two handshakes.



[Phase Two] = the expansion phase:

The candidate will be curiously try to draw further diagrams to double-check/confirm the possibility of an existence of a certain pattern.



[Phase Three] = the formulation phase:

The candidate will start quantitatively relating the number of handshakes made in the party and the corresponding number of nodes. This firstly will be done visually by simple counting then will be formulated into a mathematical formula. This will be efficient until the candidate reaches a number of nodes = 5 where it will take much more time and complexity to visually count the number of handshakes, at this point the candidate resort to using the formula then will retrospectively double-check the working of the formula for all the previous entries.

n	2	3	4	5	6
H	1	3	6	10	??????

For “n” number of nodes, the number of handshakes “H” = $\tau(n-1)$

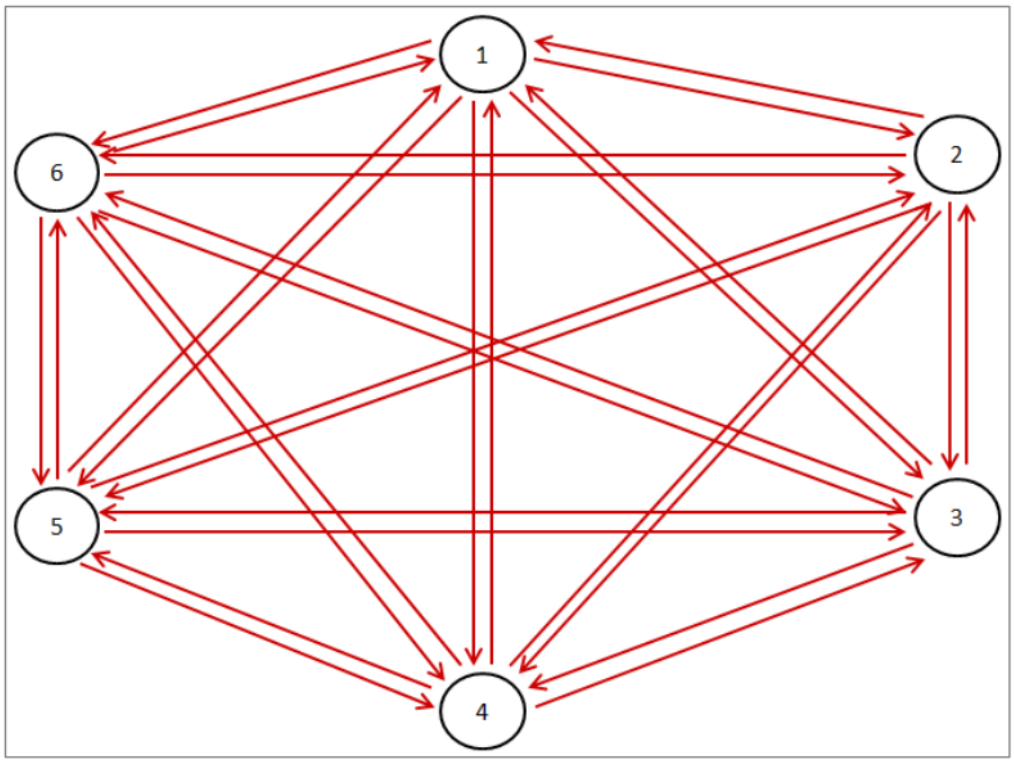
Also note that part of programming is denoting certain variables with certain letters i.e. [“n” and “H”] for [the number of nodes and the number of handshakes] respectively.

[Phase Four] = the programming phase:

Upon moving to a number of nodes of 6 and above, the candidate finds it extremely difficult (and even impossible for very high numbers of n) to visually draw the nodes and calculate the number of handshakes. At this point, the candidate will simply use the formula to find the number of handshakes for n = 6 and any other value of n (specifically for n ≥ 6).

In fact this is one of the very important uses of programming i.e. to predict events that cannot be visualized by any human brain.

For n=6 , H = $\tau(6-1) = \tau(5)$ = 5+4+3+2+1+0 = 15



[2.4.3] Exercise #3 = The Power of Linguistics and Visualization.

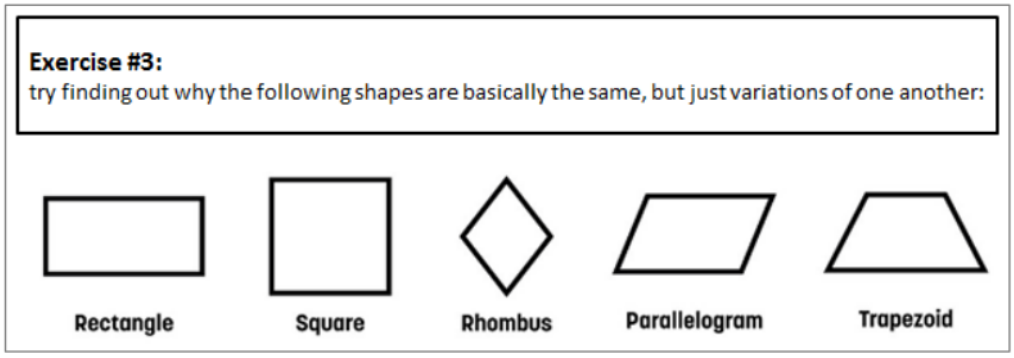


Figure 30 = exercise #3.

[1] Well all of the shapes are basically made up of points and several infinite points stacked together form a line and lines together form all of the above shapes.

[2] All of the above shapes are polygons.

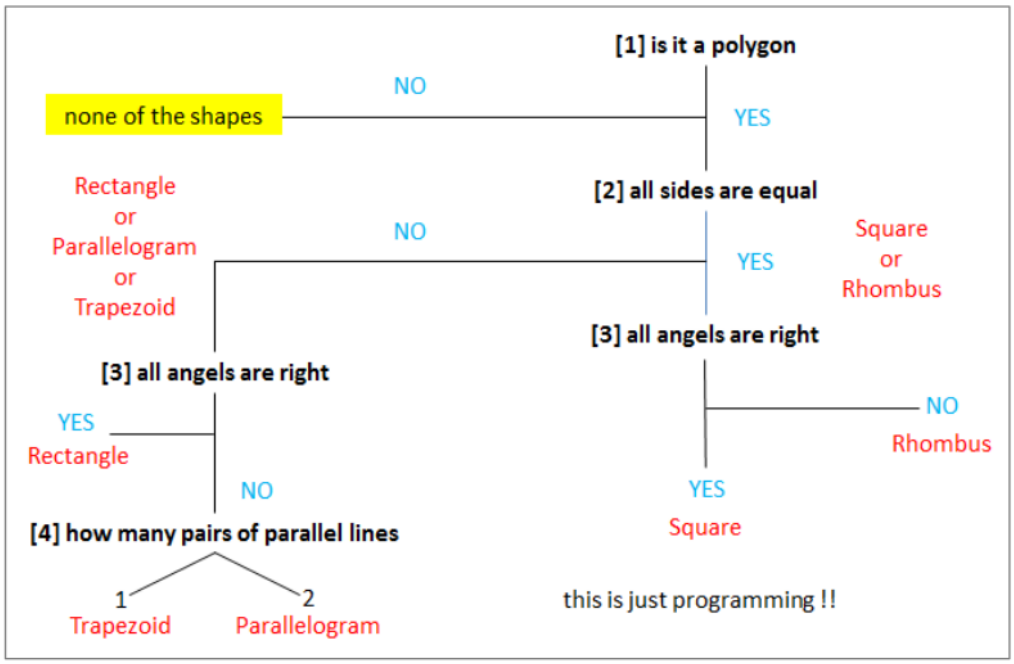
[3] Now and most importantly, all of them are different combinations of the following geometrical properties:

- All angels are right angels.
- All sides are equal.
- How many pairs of parallel lines i.e. only one pair (or) both/two pairs of parallel lines.

Accordingly we have the following:

The Shape	All Equal Sides	All Right Angels	How Many Parallel Pairs
Rectangle	NO	YES	2
Square	YES	YES	2
Rhombus	YES	NO	2
Parallelogram	NO	NO	2
Trapezoid	NO	No	1

This table is nothing else but a differently organized data-visualization i.e. this table is just the same as the following flowchart (somehow a decision tree here):



[2.4.4] Exercise #4 = The Power of Linguistics and Visualization.

Exercise #4:
What is common between all of the following letters? Accordingly fill in the blanks.

{B , C , D , ? , ? , ? , K , O , X}

{? , ? , ? , L , N , P , Q , R , S , Z}

{A , H , I , M , O , T , U , V , ? , ? , ?}

Figure 31 = exercise #4.

[1] Well all of the letters are upper-case ones !!

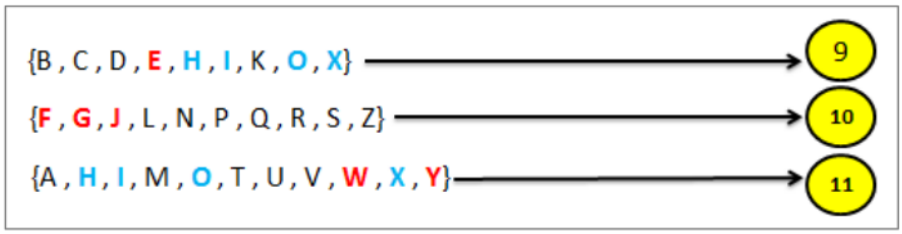
[2] Accordingly the first line of letters are those that have a horizontal line of symmetry,

the second line are those than contain no line of symmetry,

and the third line of letters are those that contain a vertical line of symmetry.

[3] Therefore, all of this applies for the upper-case format of the letters and each set's items would change with the lower-case formats.

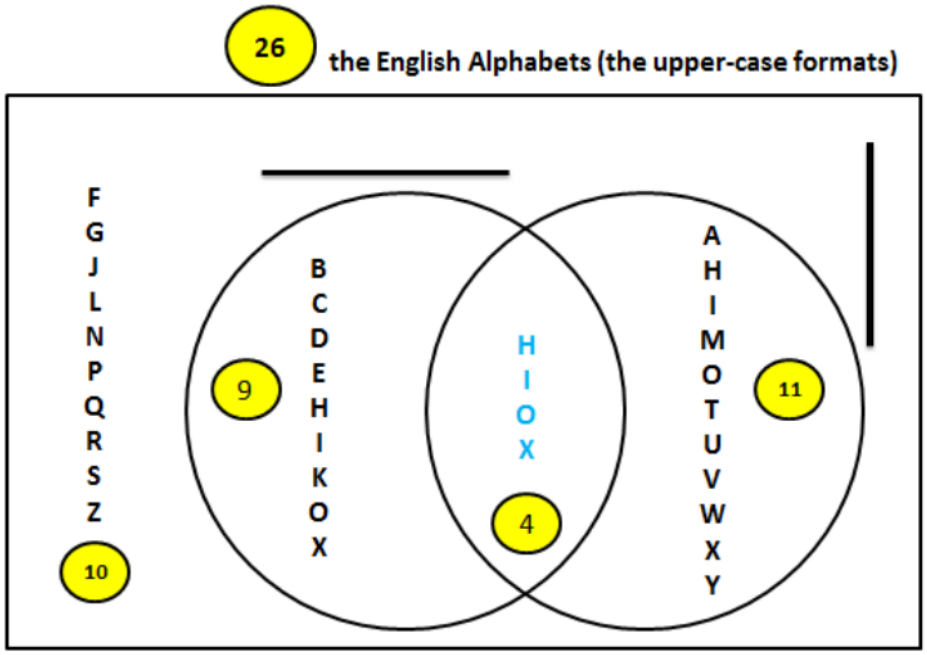
[4] Now and as the letters in each line are arranged in alphabetical order then we can fill in the blanks as follows:



[5] an extra point would be that the sum of the letters does not equal to the English 26 letters and this is because some of the letters have both [horizontal and vertical] lines of symmetry i.e. the letters {**H** , **I** , **O** , **X**} i.e. the intersection of the 1st and 3rd sets; therefore, {9} + {10} + {11} – {4} = {30} – {4} = 26.

Also note that for [this exercise and exercise #1] we are treating letters, as any other items/objects, as having sub-modalities i.e. modalities of color, shape, upper-case/lower-case, large/small, etc…

Again here data-visualization (as always) makes our life easier, as follows when using a Venn Diagram:

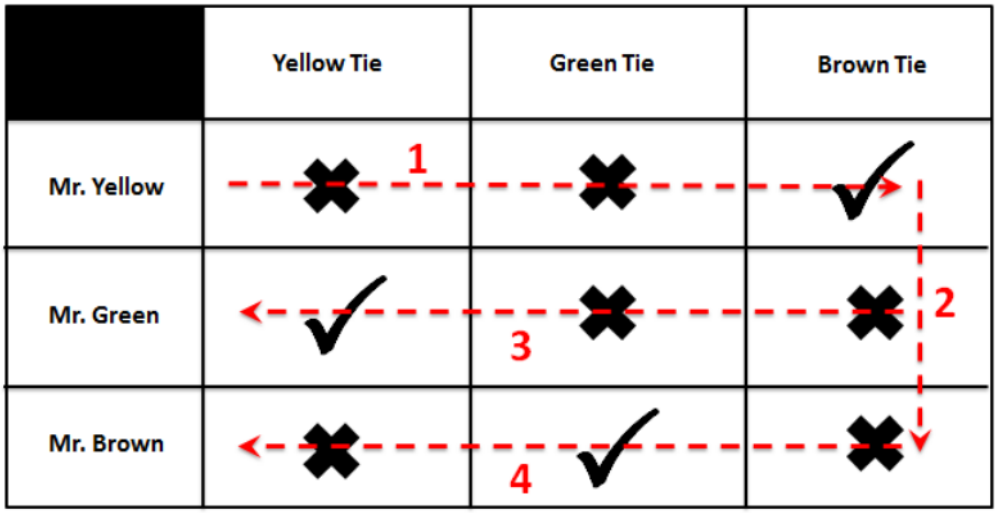


[2.4.5] Exercise #5 = The Power of Programming, Linguistics, and Neuroscience.

Exercise #5:
There are 3 gentlemen in a meeting: Mr. Yellow, Mr. Green and Mr. Brown. They are wearing yellow, green and brown ties. Mr. Yellow says: "Did you notice that the color of our ties are different from our names?" The person who is wearing the green tie says, "Yes, you are right!".

Do you know who is wearing what color of tie?

Figure 32 = exercise #5.



This exercise is very important because it guides the participant to the fact that data visualization, which is one of the tenets of NLP, enhances our critical thinking abilities and helps us better analyze the solution. Another important point to note here is that this contains one of the principals of Timeline Therapy which is going back and forth in time to cure/solve certain issues.

Here the data visualization is the use of the table and inside which we go back and forth to insert the correct crosses/ticks which acts as a guided/planned way of thinking (i.e. an algorithm-like) rather than going around randomly with the solution. Therefore, and in addition to some of the exercises above, this exercise shows the importance of data visualization in the processes of data architecture and data management.

[2.5] Improving Performance:

To improve performance, we need to first know that performance is nothing else but behaviour therefore if we need to improve performance we need to alter the related internal states inside the athlete. As defined above (under the NLP's Model of Therapy), performance is a process (i.e. a behaviour) not an outcome (i.e. not a result). If we think about it as an effort generated by the person to produce a certain amount of power or to overcome a certain amount of load, then it is very important to distinguish between the external load achieved and the internal load generated. The external load is the amount of Km(s) we are planning to run at a certain speed, it can also be

the amount of Kg(s) to lift during weightlifting and bodybuilding, and it can also be the amount of items we are able to memorize effectively in a certain amount of time. Whereas the internal load is the psychosomatic and physiological responses that our bodies generate as reactions to the external loads beared. This can be elaborated and summarized in the following diagram:

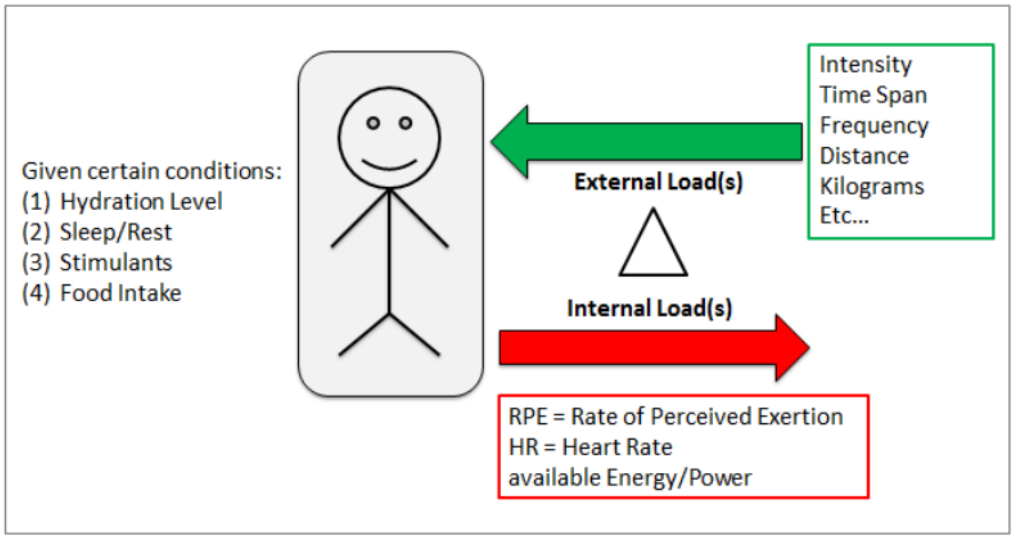


Figure 33 = my philosophy of performance.

Thus improving performance, as I personally perceive it, is the optimization of the difference/delta between the external load and the internal load i.e. increasing the external load as much as possible while decreasing the resulting internal load as much as possible provided that the conditions are kept the same and the skills of the performance remains greater or equal to a certain threshold/baseline. In other words performance is improved, given normal conditions, when:

1. The external load increases and the internal load remains the same, (or)
2. The external load increases and the internal load decreases, (or)
3. The external load remains the same and the internal load decreases.

The statement normal conditions simply mean regular hydration level, an average of 6 to 8 sleeping hours, and conventional food intake with caffeine/tea as (natural) stimulants. In addition it is important to distinguish between intensity and time span i.e. the higher the intensity the harder the external load; whereas, the higher the time taken for a certain external load to be accomplished the lower the external load is.

[3] Research Method(s).

[3.1] the study design and the objectives:

This was done to measure the effectiveness of the above battery of exercises on the performance of young students and athletes aged between 10 to 16 years old. This was specifically done by subjecting the participants to a "before vs. after" assessment through which the effectiveness of the above interventions is quantitatively valued. I will be dividing the research into two sub-interventions: (1) to assess the effectiveness of NLP-techniques on the mental performance of students and (2) the same approach towards the physical performance of athletes.

The study design using descriptive statistics will be as follows:

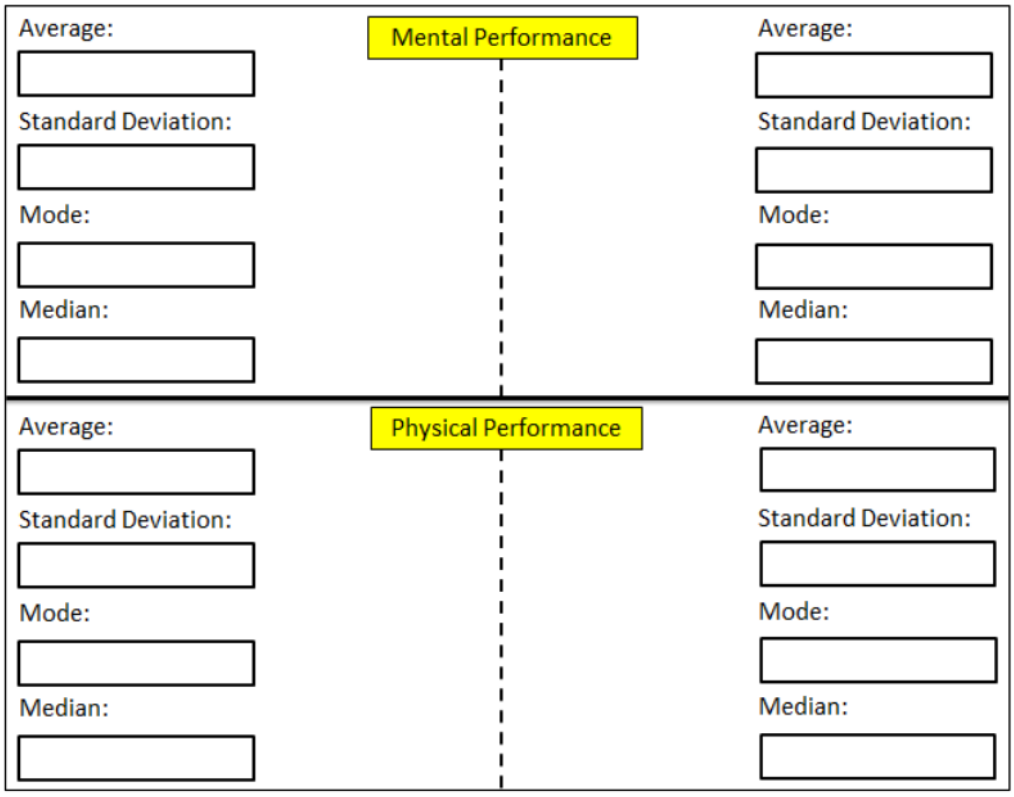


Figure 34 = design for both performances.

Where the left hand side represents the descriptive statistics before the intervention(s) and the right hand side represent those after the intervention(s). Regarding the interventions chosen for each type of performance, the following is considered:

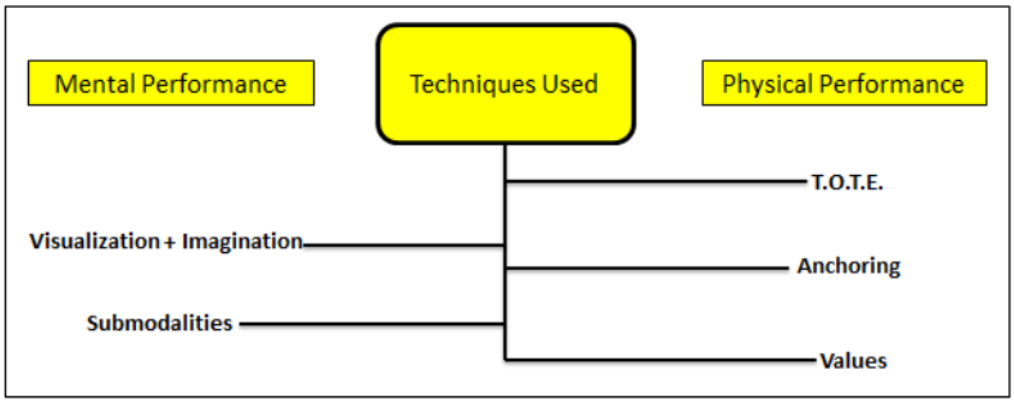


Figure 35 = the techniques used.

[3.2] the sample size and its distribution in the study design:

The sample size was 14 participants aged between 10 and 16 years old and these 14 participants were subjected to both the mental performance assessment and the physical performance assessment, but this was done on separate days. I have chosen to apply the assessment three times for each type of performance and each was also done on separate days. This is described in:

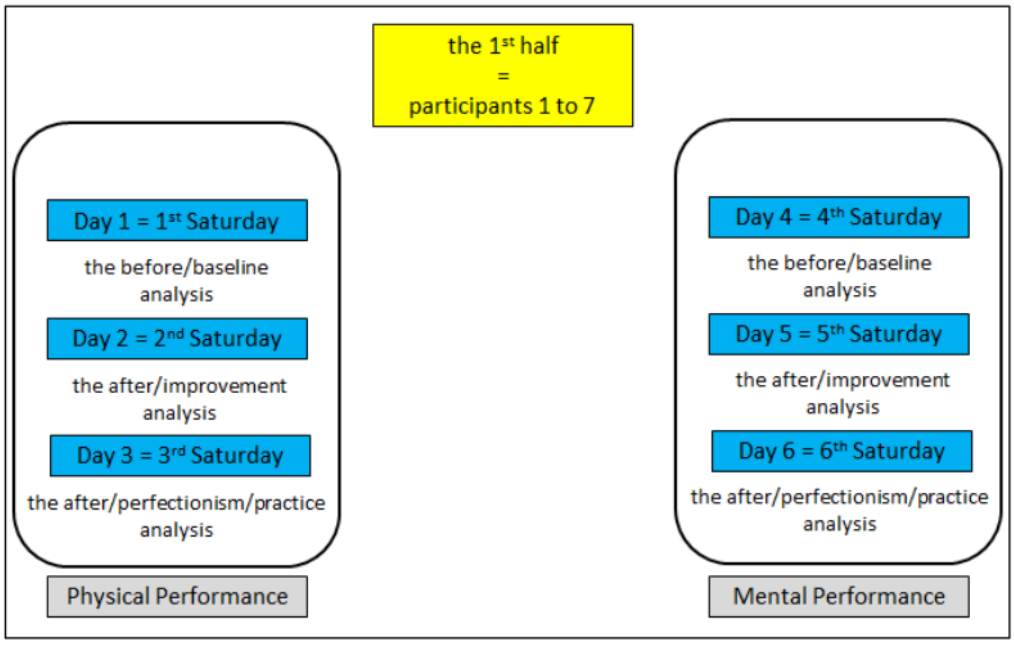


Figure 36 = the design for participants 1 to 7.

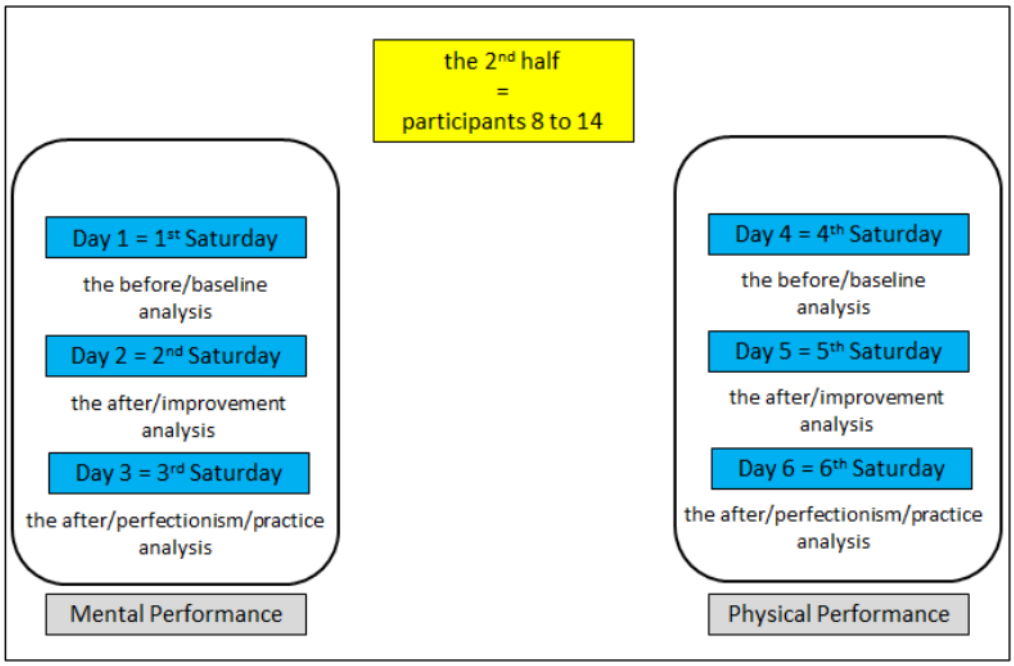


Figure 37 = the design for participants 8 to 14.

Noting that the switch between mental performance and that of physical performance alternatively between the two halves of the participants is on purpose and was implemented for the sake of avoiding any kind of interference between the battery of tests/techniques used. Another important point lies in the division of the days into three and separate days where each is a week after the other. This latter point is for the sake of ensuring that there is enough and constant break between each pair of days and the reason for choosing three days is the following:

- The before/baseline analysis: this is to set the threshold from which the participant starts improving, in other words, it sets the baseline of skills that the participant has prior to any kind of intervention.
- The after/improvement analysis: this is to check the direct improvement after the participant has adopted the techniques prescribed.
- The after/perfectionism/practice: this is to check the indirect improvement that the participant develops as a result of practicing the techniques over and over again. This is done since part of NLP is the fact of repetition and structured improvements; that is, how neurons love repetition, + how our brain loves the linguistics of images, sounds, and kinesthetic, + how structures and programs are very important.

[3.3] the study tools, intervention techniques, and the data collection:

I have already explained that the participants will be subjected to a full day of rest before the first day of assessment, in addition to the fact that on the day of the assessment the participants will be subjected to a light yet inclusive warm up.

Participants 1 to 7 will be assessed for physical performance while participants 8 to 14 will be simultaneously assessed for mental performance.

The first day assessment for the mental performers will include exercises one to five exactly as described above i.e. without any change in the content (the numbers) or the context (the style) and after the participants finish their attempts I will be explaining the logic behind each of the exercises. Whereas the first day assessment for the physical performers will include the T.O.T.E. biking exercise clarified above too. Now moving to the second day of the assessment, exercises one to five will change both in content and context; whereas, the T.O.T.E. biking exercise will increase in an accumulated way i.e. a way that challenges the capacity of the previous time/week/day, for example, if the last weeks capacity was to warm up using a 5 Km bike then perform for a 30 Km using 6 Km round intervals (i.e. 5 rounds) and using anchoring at the end of each round, then the second week will be warming up for a 6 Km bike then performing for a 50 Km using 10 Km round intervals and an anchor at each of the rounds with the anchor being enhanced using rewards such as a caffeine intake of 50 mg (i.e. a 2 in 1 Nestle sachet weighing 20g). Finally the third day of assessment, exercises one to five will remain in their varied version of the second day, but we will measure the improvement in performance relative to both time and accuracy when those versions were repeated differently over and over again. Regarding the T.O.T.E. biking exercise, we will extend that accumulative performance style/approach for a higher number of Km(s).

The data collection was done using a timer/chronometer which was started after the instructions of the questions were repeated twice and the informed consent to start was taken from the participant. The times are recorded and the descriptive statistics calculated accordingly.

[4] Results, Discussions, and conclusions:

The flow of this section is firstly stating what was happening in each of the three days one after the other and how they are all interconnected. Consequently reporting the quantitative results for both the mental performance and the physical performance. Afterwards the qualitative discussions and conclusions for both performances are to be mentioned. Finally the analysis of the output of the values-questionnaire will be applied which will also be largely further analyzed in the future scope/work.

[4.1] The Days

[4.1.1] the first day of assessment:

Regarding the mental performance, the exercises that were given to the participants and then explained/solved with detailing everything in them are the same as what were presented above. The target of this day was to set up the threshold for the participants i.e. to make sure and prepare all of them to take one minute to memorize each item in the list; therefore, memorizing the whole list in thirteen minutes (i.e. one minute for each item). Note that the participants are free to choose any of the methods to perform. This was for the memorization exercise and the students are given 40 minutes to finish the rest of the (four) exercises i.e. an average of 10 minutes for each exercise.
Regarding the physical performance, the same philosophy of setting up the threshold and here it was for the participant to cover a distance of 1.5 Km biking at the hardest gearing set-up (i.e. 8 by 3). The threshold we need to set up is taking 5 minutes to finish this track which is an elliptical track. The track is to be repeated 12 times where a break of 2 minutes is to be taken each 3 tracks covered. The break is to drink a 500 ml (ambient temperature) water bottle. Therefore having a total of 4 breaks i.e. a break every 3 rounds for a total of 12 tracks (the latter equivalent to 12 x 1.5 = 18 Km to be covered in 90 minutes i.e. one hour and a half).

[4.1.2] the second day of assessment:

In this second day the general aim was to increase the load for performance while maintain the same time constraints i.e. measuring the improvement induced by each of the techniques applied.
Regarding the mental performance, the following exercises were given and below each one of them is the justification for its use:

Exercise #1:
Try memorizing the following lists using any method you know/like/prefer.

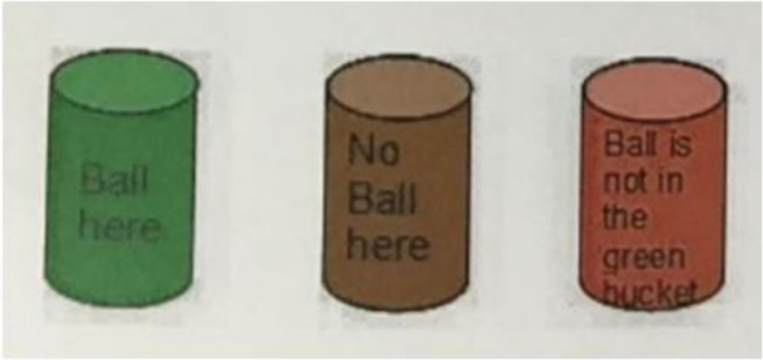
1. Table
2. Beer
3. Cap
4. Doll
5. Pen
6. Star
7. Bag
8. Exclamation
9. Fantasy
10. Handbook
11. Stapler
12. Water
13. Medicine

1. Table
2. Crystal
3. Cap
4. America
5. Star
6. Fantasy
7. Handbook
8. Cloud
9. Chain
10. Exclamation
11. Stapler
12. Water
13. Medicine
14. Joint
15. Sofa
16. Sophie
17. Lamp
18. Gold
19. Star
20. Blue
21. Pharmacy
22. Lebanon
23. Beer
24. Doll
25. Pen
26. Bag

The participant is asked to repeat the same process as in day one, but this time for memorizing double the number of items i.e. 26 items instead of 13 items.
Now the $2^{nd}/3^{rd}/4^{th}$ exercises:

Exercise #2:
At Omar Mukhtar's School, Mrs. Nadine 3^{rd} grade students line up in a row. If Matt is #14 counting from the front of the line , and #8 counting from the back of the line. How many students are in the line?

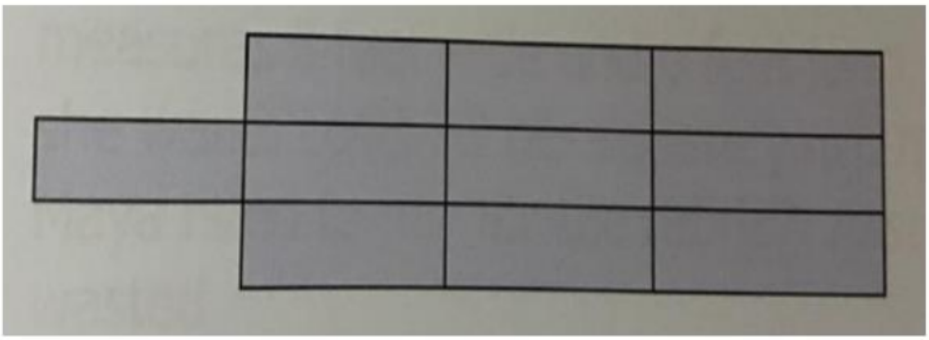
Exercise #3:
There are three buckets of different colors: green, brown, and orange. There is a ball in one of the buckets. The buckets are labeled; however, only ONE bucket is labeled correctly. Do you know which bucket has the ball in it?



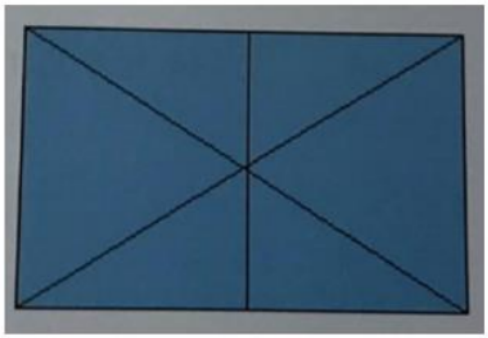
Exercise #4:
Katia, Rami, and Carol go to 3 different schools: A, B, and C. Katia does not go to schools B or C. Carol does not go to school B. Which schools do the kids go to?

These exercises would target measuring the effect of learning the techniques used (and explained) at day one mental performance. The total time given for these exercises is 7.5 minutes for each exercise i.e. a total of 22.5 minutes. In addition, these exercises specifically target the ability of the participant to use schematics, flowcharts, and algorithms (i.e. dynamics thinking strategies) to reach to the answers in the most optimal ways i.e. most organized, zero error, and least time/effort exerted.
Now exercises 5 and 6:

Exercise #5:
How many rectangles are in the following figure?



Exercise #6:
How many triangles do you see?



These exercises are one of the ways to detect the ability of the participants to detect hidden patterns while maintaining focus on not missing any of the shapes nor repeating any of them.
Regarding the physical performance, the participant is to cover a total of 27 Km in the following conditions/schema: the same track of 1.5 Km i.e. a total of 18 tracks where the participant is to stop for the 2 minutes break every 6 tracks covered where he will be having a 250 ml water and a shot of 100 mg caffeine. The time is recorded for that entire journey.

[4.1.3] the third day of assessment:

This day is designed for the sake of monitoring the development in the performance due to the repetition/practice of the techniques that were studied/analyzed at the 2nd day above.
Starting with the mental performance, the exercises and their respective explanations are as follows:

Exercise #1:
Try memorizing the following lists using any method you know/like/prefer.

1. Table
2. Beer
3. Cap
4. Doll
5. Pen
6. Star
7. Bag
8. Exclamation
9. Fantasy
10. Handbook
11. Stapler
12. Water
13. Medicine

1. Table
2. Crystal
3. Cap
4. America
5. Star
6. Fantasy
7. Handbook
8. Cloud
9. Chain
10. Exclamation
11. Stapler
12. Water
13. Medicine
14. Joint
15. Sofa
16. Sophie
17. Lamp
18. Gold
19. Star
20. Blue
21. Pharmacy
22. Lebanon
23. Beer
24. Doll
25. Pen
26. Bag

Obviously this is the exact same as on day two, but the participant is trying to strengthen the bonds of the memories developed which will reflect their ability to improve with time as they practice more and more.
Now the following exercises:

Exercise #2:
39 third grade children line up in a row to get on a bus for a field trip. Ahmad is the 18th from the front. Yousef is the 32nd from the back. How many children are there between Ahmad and Yousef?

Exercise #3:
Mr. Yellow, Mr. Red and Mr. Blue need to pick 1 of 3 pens that are yellow, blue and red. They do not want to pick a open that matches their last name. Mr. Yellow also does not want a blue pen. What color pen did Mr. Yellow, Mr. Red and Mr. Blue pick?

Exercise #4:
Karim's train has 4 cars of different colors; yellow, green, red and blue. How many different ways can Karim arrange his train cars?

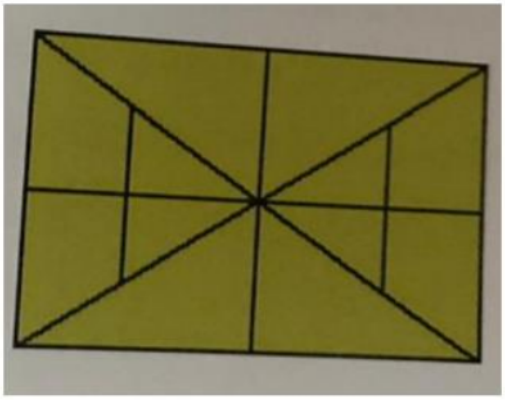
Exercise #5:
Jim, Jill and Jack had a race at school. Jim is not first, Jill is not second and jack is not last. Jack finished before Jill. What order did they finish in?

Exercise #6:
Three people, named Chantal, Pauline, and Mohammad, have ordered breakfast. One person ordered scrambled eggs and sausage; another ordered an omelet with cheese and toast; and the other ordered yogurt with fruit and honey. Which person ordered each breakfast?, given that:

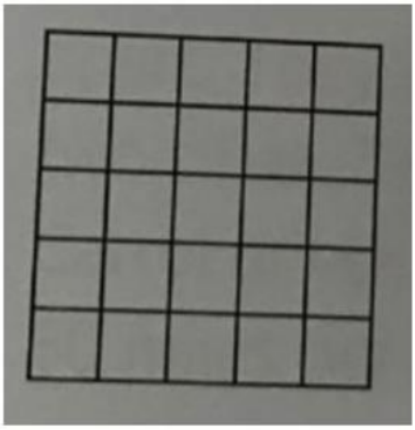
- Chantal does not like to eat sweet things for breakfast.
- Pauline does not like eggs.
- Mohammad always eats eggs and meat for breakfast.

These exercises are again for improving the ability of the participant to use schematics, flowcharts, and algorithms (i.e. dynamics thinking strategies) to reach to the answers in the most optimal ways i.e. most organized, zero error, and least time/effort exerted. Finally we ended the mental performance with the following geometrical pattern detection exercises:

Exercise #7:
How many triangles are there?



Exercise #8:
How many squares are here?



Regarding the physical performance, the participant is to cover a total of 36 Km in the following conditions/schema: the same track of 1.5 Km i.e. a total of 24 tracks where the participant is to stop for the 1.5 minutes break every 8 tracks covered where he will be having a 500 ml water and a shot of 150 mg caffeine. The time is recorded for that entire journey.

[4.2] The Outputs:

Participants 1 to 7		Participants 8 to 14
Physical Performance		Mental Performance
{5 , 5 , 5 , 5 , 5 , 5 , 5}	Day 1 = 1st Saturday	{13 , 13 , 13 , 13 , 13 , 13 , 13}
{4.9 , 4.1 , 4 , 4.4 , 4.5 , 4.5 , 4.8}	Day 2 = 2nd Saturday	{20.4 , 16.8 , 17 , 22 , 24.3 , 25, 23.3}
{4.4 , 4 , 3.9 , 4.2 , 4.3 , 4.3 , 4.5}	Day 3 = 3rd Saturday	{17 , 15.1 , 16 , 21 , 20 , 16.8 , 15.9}
Mental Performance		Physical Performance
{13 , 13 , 13 , 13 , 13 , 13 , 13}	Day 4 = 4th Saturday	{5 , 5 , 5 , 5 , 5 , 5 , 5}
{21 , 21.3 , 22.6 , 18.9 , 19 , 19 , 20}	Day 5 = 5th Saturday	{4.7 , 4.3 , 4.5 , 4.1 , 4.1 , 4.7 , 4.8}
{17 , 15.4 , 20 , 16 , 17 , 15 , 18}	Day 6 = 6th Saturday	{4.2 , 4.2 , 4.1 , 4 , 4 , 4.5 , 4.1}

Figure 38 = the results for all the participants.

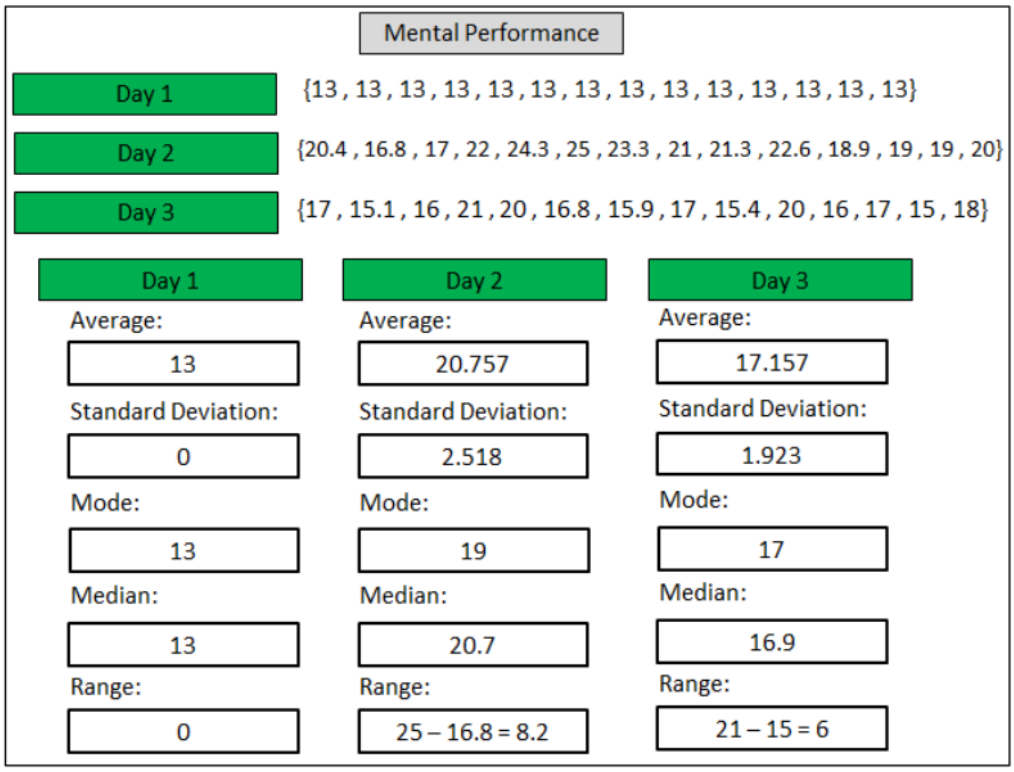


Figure 39 = the mental performance results.

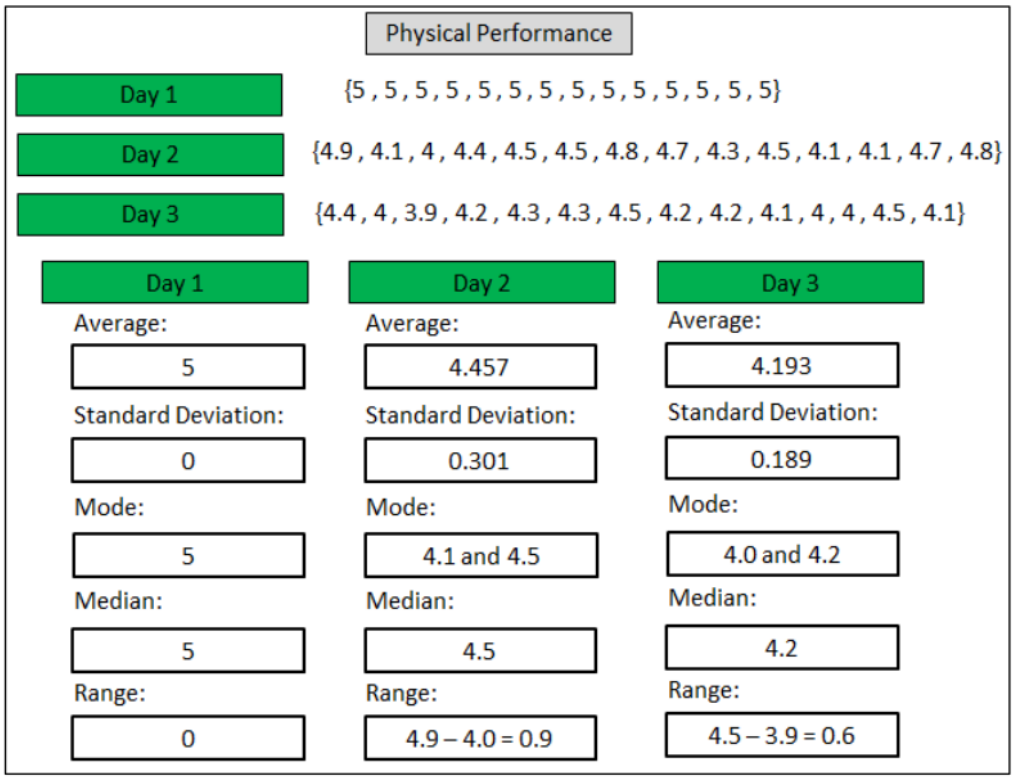
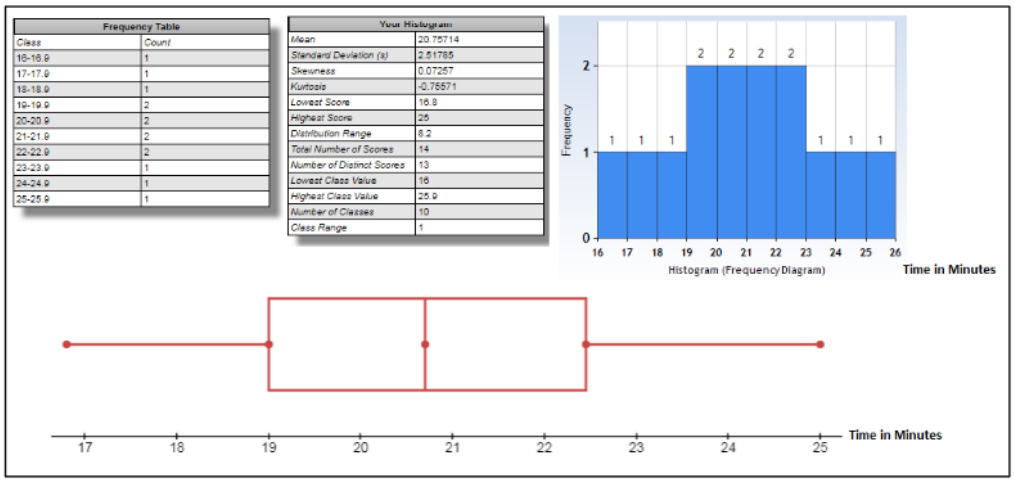


Figure 40 = the physical performance results.

For both types of performances and as the data shows, the average time decreased from one day to the other. In addition, both the standard deviation and the range of the data sets decreased in the successive days.
The decrease in the average time clearly indicates that the participants (on average) took lower times to finish the tasks although the complexity of the tasks increased successively (i.e. with the days). Another insight can be obtained from the decrease in the standard deviation and the range, which is that the numbers are getting closer to each other (manifested clearly by the change in skewness to a more of a right-skewed distribution) i.e. there is a convergent pattern in the results towards a lower optimal performance and there are no outliers whatsoever.

Furthermore, the following are the boxplots and the respective histograms for days 2 and 3 (for both mental and physical performances):
[the 2nd Day]
Mental Performance

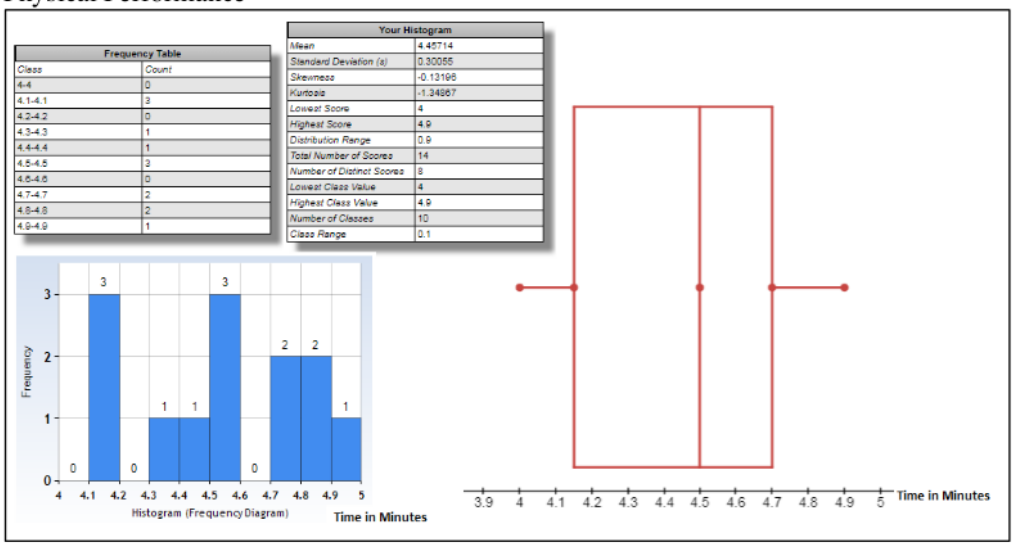


Frequency Table	
Class	Count
16-16.9	1
17-17.9	1
18-18.9	1
19-19.9	2
20-20.9	2
21-21.9	2
22-22.9	2
23-23.9	1
24-24.9	1
25-25.9	1

Your Histogram	
Mean	20.75714
Standard Deviation (s)	2.51785
Skewness	0.07257
Kurtosis	-0.75571
Lowest Score	16.8
Highest Score	25
Distribution Range	8.2
Total Number of Scores	14
Number of Distinct Scores	13
Lowest Class Value	16
Highest Class Value	25.9
Number of Classes	10
Class Range	1

Figure 41 = graphs for second day's mental performance.

Physical Performance

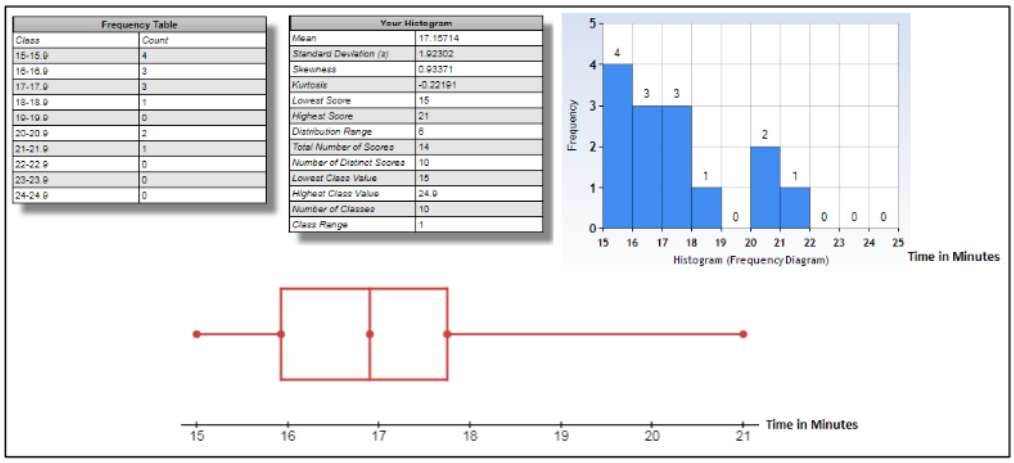


Frequency Table	
Class	Count
4-4	0
4.1-4.1	3
4.2-4.2	0
4.3-4.3	1
4.4-4.4	1
4.5-4.5	3
4.6-4.6	0
4.7-4.7	2
4.8-4.8	2
4.9-4.9	1

Your Histogram	
Mean	4.45714
Standard Deviation (s)	0.30055
Skewness	-0.13196
Kurtosis	-1.34867
Lowest Score	4
Highest Score	4.9
Distribution Range	0.9
Total Number of Scores	14
Number of Distinct Scores	8
Lowest Class Value	4
Highest Class Value	4.9
Number of Classes	10
Class Range	0.1

Figure 42 = graphs for second day's physical performance.

[the 3rd Day]
Mental Performance

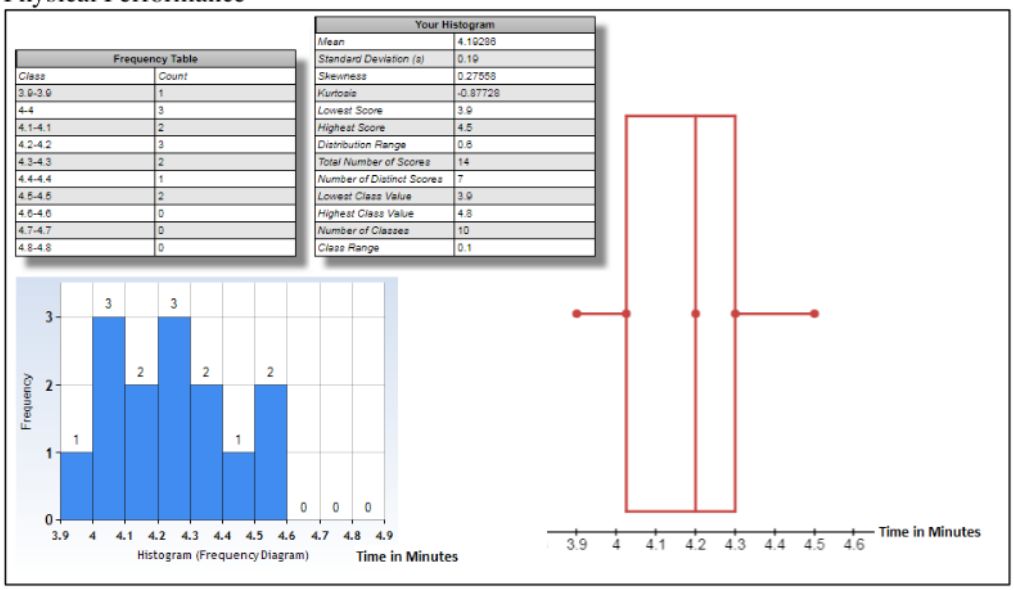


Frequency Table	
Class	Count
15-15.9	4
16-16.9	3
17-17.9	3
18-18.9	1
19-19.9	0
20-20.9	2
21-21.9	1
22-22.9	0
23-23.9	0
24-24.9	0

Your Histogram	
Mean	17.15714
Standard Deviation (s)	1.92302
Skewness	0.93371
Kurtosis	-0.22191
Lowest Score	15
Highest Score	21
Distribution Range	6
Total Number of Scores	14
Number of Distinct Scores	10
Lowest Class Value	15
Highest Class Value	24.9
Number of Classes	10
Class Range	1

Figure 43 = graphs for third day's mental performance.

Physical Performance



Frequency Table	
Class	Count
3.9-3.9	1
4-4	3
4.1-4.1	2
4.2-4.2	3
4.3-4.3	2
4.4-4.4	1
4.5-4.5	2
4.6-4.6	0
4.7-4.7	0
4.8-4.8	0

Your Histogram	
Mean	4.19286
Standard Deviation (s)	0.19
Skewness	0.27558
Kurtosis	-0.87728
Lowest Score	3.9
Highest Score	4.5
Distribution Range	0.6
Total Number of Scores	14
Number of Distinct Scores	7
Lowest Class Value	3.9
Highest Class Value	4.8
Number of Classes	10
Class Range	0.1

Figure 44 = graph for third day's physical performance.

[4.3] Values-Analysis

The results of the questionnaires distributed to the participants in order to detect the most frequent values in sports performance show that the seven major values involved are:

Figure 45 = the seven core values.

And as I have learned from the "Barca Innovation Hub and University" that values in sports performance are linked to the human structures (somehow the energy motors) that make up the human athlete.
In what comes next I will be defining those structures then I will be moving to schematically show the relationships between these links and the structures. So let us start with the definitions. The "human player" has 8 structures that shape the player and her/his talent. Energy dissipation takes place through them and these are in constant interaction and permanent configuration together between one another as well as with the external environment basically the team, coach, and the complex game participated in.
After intensive reading of the "Barca modules", I have realized that these structures can be called "the energy organs" of each player i.e. in addition to the biological organs that we all know and each one of them has a unique nature that interacts with a specific type of factor. This fact can be represented pictorially as:

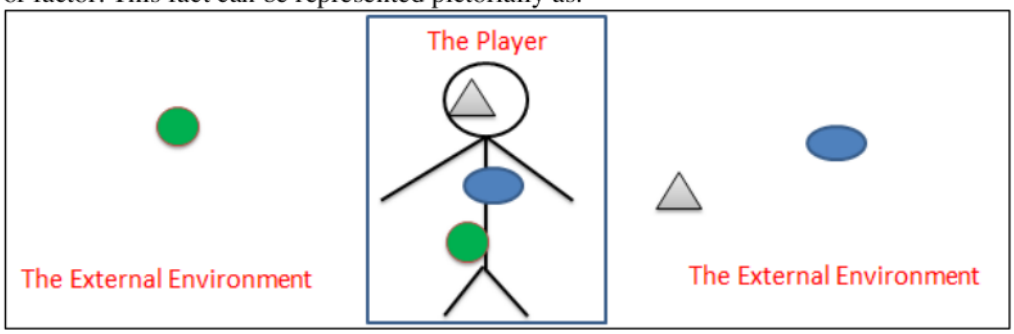


Figure 46 = the philosophy of athlete-environmental interaction(s).

These structures interact with one another to form a certain instantaneous energy profile of the athlete. The eight structures and a sample of such an interaction are shown below:

The 8 structures are listed below:

- Bioenergetic structure
- Conditional structure
- Coordination structure
- Cognitive structure
- Socio-affective structure
- Emotive-volitional structure
- Expressive-creative structure
- Mental structure

An interaction sample/example might look like:

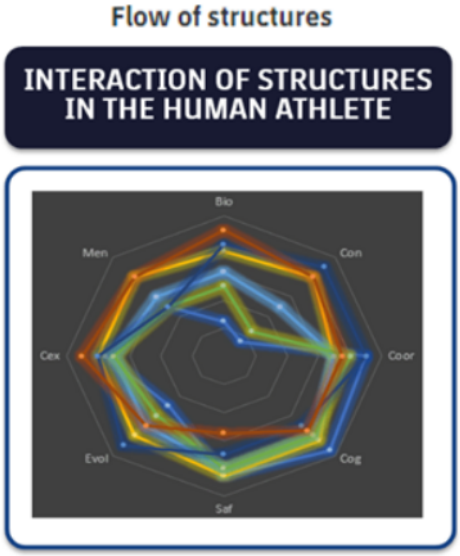


Figure 47 = the eight energy motors of every athlete.

In the questionnaire of my dissertation I have found the following links/relationships between the values elicited and six of the structures presented by the "Barca Innovation Hub and University". It will be so complex to define and link all the six with the values therefore I have decided to limit my definitions to three of the structures only and the rest will definitely be in the future work/scope.
The three structures and their definitions are in the following:

Coordination Structure

This structure considers the relationship (direct or indirect) of the player with the ball, the game, the supports, movement, changes of direction and turns, among others. In other words, it decreases the error/distance between the "mathematical and physical" nature of the motor action model (the nominal one) with that of the real performed one. This acts as a way of drilling deeper into the details of the model and reality, such that we understand exercising (the motor model) in a greater accuracy and stability thus optimizing the performance of the players.

In order to optimize this structure, it is a must to consider:

(1) The following three coordination capacities: Motor Performance Area (Movement Control Capacity), Perception Temporal Area (Implementation Capacity in the Space), Perception of Time Area (Reaction Time Capacity.
(2) Some elements that contribute to these capacities, such as: Variation in Movement Execution, Combination of Movements, Spatial Variations in Execution, Temporal Variations in Execution.

Cognitive Structure

This structure refers to the three elements of the "Cognitive Functionality" which are: Extract, Process, Transform. These elements contribute to the interpretation and understanding of the FCB's style of game play and thus open the horizons for better performance by the players on the field.

These elements are very important because they act as a way of forming mental (concept) maps i.e. cognitive schemas that work both before, during, and after the trainings/competitions. These would form the (database) way to self-organize as a player and perform better as a whole team. The three elements are defined as:

(1) Extract (also called "Stimulus Identification": whether it concerns the active or passive participation of the player, I refer to this element as "the Eye of Wisdom" because one of the differences between an intelligent (high cognitive) player and other players is that she/he is able to catch the conveyed meaning in any specific event/state/change/etc... that takes place both inside herself/himself as well as the surroundings (environment). To sum it up, this element is closely linked to the concept of self-sensitivity as well as self-accountability.

(2) Process (also called "Response Selection"): (from my Cognitive Psychology course) the six cognitive processes are basically the six levels of thinking skills which are: remember, understand, apply, analyze, evaluate and create. In short, these will help the information extracted to be attached to our memories then practiced upon then mastered as skills/techniques then finally create new patters/sequences/skills/etc...

(3) Transform (also called "Response Programming"): this element specifically means the way we fit/transform/stick our processed information (i.e. knowledge) into our existing mental schemas so that they become part of our identity and thus optimize our performance either instantaneously or in the coming future.

Mental Structure

I have always considered sciences as all emerging from the same philosophical roots/branches. This is greatly emphasized to me again here. This is because of the existentialist manifestation of the Mental Structure which is reflected in its journey/attempt to understand, comprehend and identify the meaning and purpose of our existence. This was also present to me during my "Logotherapy Course" by Dr. Viktor Frankl Institution for Logotherapy. The latter means the search for meaning and Dr. Viktor Frankl himself changed the title of his book from "the Pursuit of Happiness" to "the Pursuit of Meaning".

Now when applied to the soccer field, the player has to ask the ultimately most important question of: What are my goals as a player ? i.e. What do I want to be here ? These sound like simple questions, but these questions are the core block/starting point for each and every player and collectively as a team. This above mentioned question resembles that of the existentialist philosophy which are: From Where ? To Where ? And Why ? The Mental Structure resembles the saying: "Begin with the End in Mind". It is also coincides with the concepts of mental archiving and referencing.

Remember that the coach might ask the player the question mentioned above. In all the cases, the mental structure will help the player be decisive, motivated, persistent, and always looking forward for being better in every second of his sporting life/career. It will also implant a high level of resilience and flexibility (where both encompass patience) that will be manifested both in the performance of the athlete as well as in her/his personal life. The mental structure is also important as a tool when considered to look at soccer in a totally different perspective. The new perspective includes playing for the sake of enjoyment instead of just winning. This perspective also means a special way of communication, autonomy, and decision-making applied by the athlete in the field instead of our daily life. In short and just for the sake of ending this first part of the Activity of this Module, the better/stronger/more optimized "Mental Structure" we possess, the better our athletic performance will be (as a non-linear proportional relationship).

Now the way these/such structures are linked to values can be shown clearly in what follows:

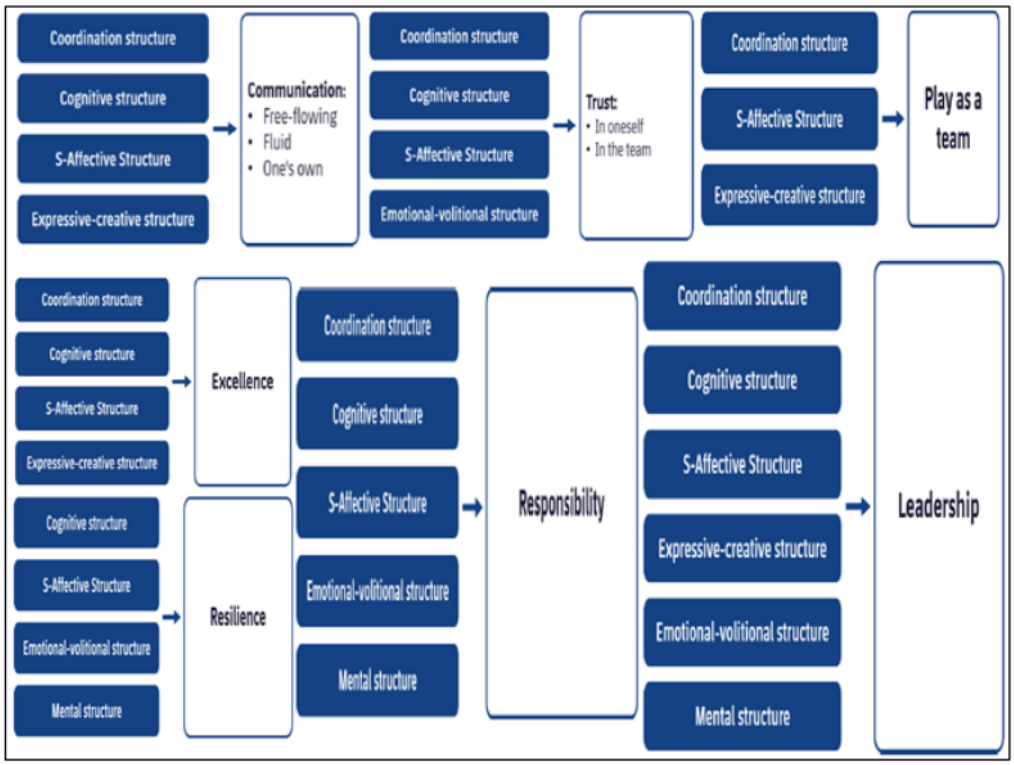


Figure 48 = clustering of the values-1.

Finally and as part of my qualitative analysis of these values, I have decided to cluster them into groups of common structures and then another cluster for those values that lack one specific structure i.e.:

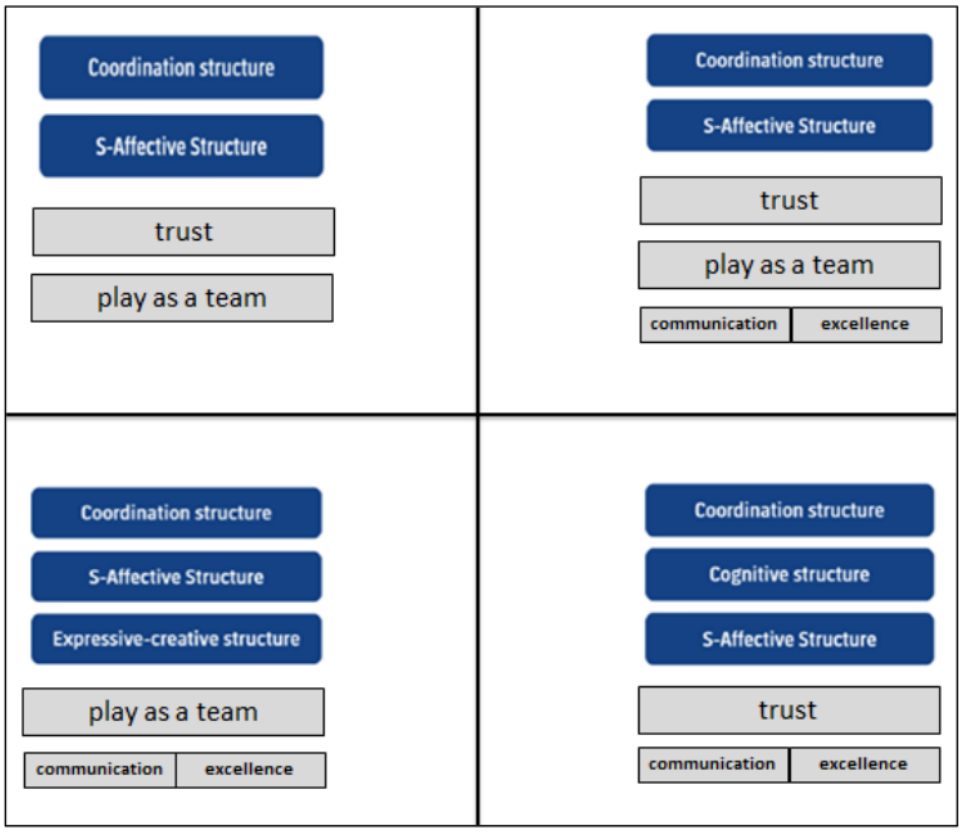


Figure 49 = clustering of the values-2.

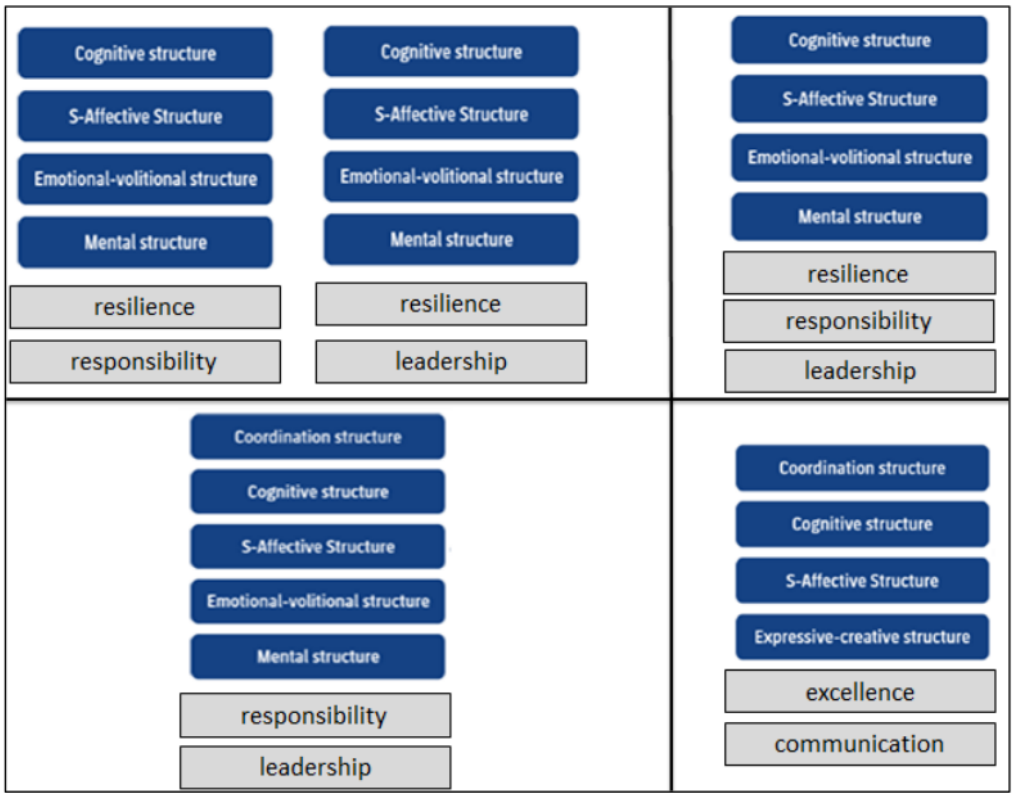


Figure 50 = clustering of the values-3.

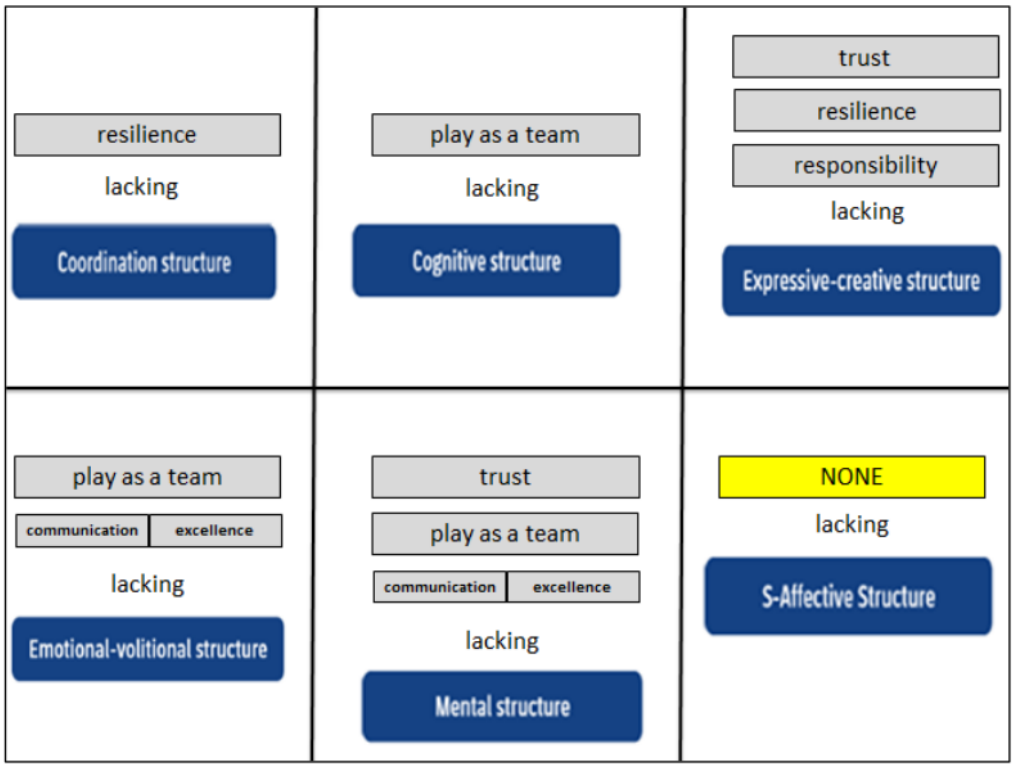


Figure 51 = clustering of the values-4.

The above schematics are very important in the hierarchy of values and the way we move from one value to another thus be able to empower the relative structures through the values and thus empower the performance of the athletes. What is just mentioned is enough (as a qualitative analysis) for this dissertation noting that in the future work (i.e. my PhD) I will be expanding more into the details of this.

[5] Future Scope:

There are so many factors that I will be considering in my future academic journey. The first one is forcing the participants to choose one of the methods in the imaginative techniques where this will be highly dependent on the preferred representational system of each of the participants. The latter is to be detected using certain tests and questionnaires. Then cross comparing the performance across those different methods and also analyzing the performances across the different phases (i.e. the sub-steps mentioned above). Another point to consider is that because the data set of each of the three days is made up of two subsets i.e. the first seven entries representing participants 1 to 7 and next seven entries representing participants 8 to 14; therefore, we need to combine them using a different way/formula than simply stacking the 14 items/entries together. Furthermore, analyzing more graphs/matrices (like scatter plots, covariance matrices, etc…) is a must specifically when plotting more than one graph/matrix on the

same grid. In addition it is very important to link the threshold/baseline approach used to the “general adaptation theory” in sports performance while manipulating certain combinations of variables and keeping one or more as constants. The latter approach is based on the following processes “thresholding, improving, recovery/adaptation, then back again to thresholding”. It is also important to mention that this is just a preliminary study which will be deepened later during my PhD studies which will definitely be connecting the dots of the bigger picture and one of the ways will be done through more qualitative analysis of the values effects on sports performance where I will be residing so much to the giant book of “Values” by the Author Adriana James. This more intensive study will also include defining all of the eight human structures (rather than only the three done here) and how they are linked to the seven values elicited. Additionally and related to values, this dissertation work could be expanded to cover topics like how certain values serve individual sports while others serve team sports, and even can be extended to cover topics like how human structures and values can be used to help in the psychotherapy of certain disorders like OCD (Obsessive Compulsive Disorder). Moreover and as a direct result of the increase in the complexity of the analysis, more qualitative and quantitative research methods will be utilized which will open the doors of clustering the order of the exercises in relation to the type of intelligence/aptitude they target; for example, verbal, spatial, and numerical aptitudes. With such broadening of the concepts, the questionnaires and related documents distributed will also have to be included too. Last but one, the implications with the different types of exercises is to be considered too i.e. endurance training, resistance training, and many more. Lastly it is important to note that although learning bias exists to some extent in this dissertation, it is much more important for us to learn certain patterns and extend those mental schemas/maps of those patterns with every new experience; therefore, learning bias is not a threat to my study and on the contrary it is one of the forms of what I call “structured and flexible” intelligence which is much more grounded and induces more confidence, just the same way an Octopus extends/grows its body!!!

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Appendices

Definition of Terms/Glossary:

(1) Accessing Cues: External signs that give us information about what we do inside. The signs include breathing, gesture, posture, and eye patterns.

(2) Acronyms: Are typically the most familiar type of mnemonic strategies. Acronyms use a simple formula of a letter to represent each word or phrase that needs to be remembered.

(3) Amount of Contrast: is the range of brightness, from lightest to darkest, in an image.

(4) Anchor: the NLP technique whereby a stimulus is linked to a response. An anchor can be intentional or naturally occurring.

(5) Association: It deals with your relationship to an experience. You are associated when you are looking through your own eyes, and experiencing the auditory and kinesthetic at the same time.

(6) Behaviour: an organism's activities in response to external or internal stimuli, including objectively observable activities, introspectively observable activities, and nonconscious processes. (it is a process, for example, performance)

(7) Chaining Anchor: sequential process of moving to a significantly different state.

(8) Chunk-up/Chunk-down/Lateral-Chunk: As in thinking – moving up or down a logical level. Chunking up is moving up to a higher, more abstract level that includes the lower level. Chunking down is moving to a level, which is more specific. Lateral Chunking is when we move horizontally between the values.

(9) Circle of Excellence: An imaginary circle to install new or additional resources relative to a situation where different behaviour or thinking is wished.

(10) Classical Conditioning: the process in which an automatic, conditioned response is paired with specific stimuli.

(11) Collapse Anchor: replacing a negative anchor with a positive one for the same stimulus.

(12) Communication Theory: the branch of knowledge dealing with the principles and methods by which information is conveyed.

(13) Complex Equivalence: Where two expressions are interpreted as being synonymous.

(14) Delete: One of the three major processes on which the Meta Model is based. Distortion occurs when we leave out a portion of our experience.

(15) Disney Strategy: It is a creative strategy that can be used to create new products or to solve problems. The strategy includes three roles or mindsets that each has a specific goal.

(16) Dissociation: It deals with your relationship to an experience. You are dissociated when you are not looking through your own eyes and you see your body in the picture.

(17) Distort: One of the three major processes on which the Meta Model is based. Distortion occurs when something is mistaken for that which is not.

(18) Double Blind: Where the Client is given two choices (both of which are un-preferable/un-desired) separated by an "or". This is just the illusion of choice.

(19) External Load: an objective quantification of the work done during training, such as distance covered, number of acceleration and decelerations, max speed achieved, or metabolic power expressed.

(20) Eye Accessing Cues: Movements of the eyes in certain directions which indicate visual, auditory, or kinesthetic thinking.

(21) Flowchart: is a diagram that depicts a process, system or computer algorithm. They are widely used in multiple fields to document, study, plan, improve and communicate often complex processes in clear, easy-to-understand diagrams.

(22) Focused vs. Defocused: “Focused” simply means no blur is in the picture and “Defocused” means the picture contains blur.

(23) Framed vs. Panoramic: "Frame" is a picture with limited field of view, while "panorama" is a picture with unlimited field of view (spherical/360/Virtual Reality picture).

(24) Generalize: One of the three major processes on which the Meta Model is based. Distortion occurs when one specific experience represents a whole class of experiences.

(25) General Semantics: is not any “philosophy,” or “psychology,” or “logic,” in the ordinary sense. It is a new extensional discipline which explains and trains us how to use our nervous systems most efficiently.

(26) Gestalt Therapy: is a form of psychotherapy that is centered on increasing a person's awareness, freedom, and self-direction.

(27) Hierarchy of Values: is a system of organizing values into different ranks or levels of importance.

(28) Hypnosis: can be seen as 'a waking state of awareness, (or consciousness), in which a person's attention is detached from his or her immediate environment and is absorbed by inner experiences such as feelings, cognition and imagery'.

(29) Imagination: the faculty or action of forming new ideas, or images or concepts of external objects not present to the senses.

(30) Internal Load: is represented by the response of the sum of psychophysiological stress derived from the external load.

(31) Lead Representational System: determines how we store information and how we access it.

(32) Memory/Cognitive Enhancers: are drugs/techniques/tools that some people use in an attempt to improve memory, increase mental alertness and concentration as well as boost energy levels and wakefulness.

(33) Memory Palace: is a memorization strategy, based on visualizations of familiar spatial environments to recall information.

(34) Meta-Model (Language): A model of Language, derived from Virginia Satir that allows us to recognize deletions, generalizations, and distortions in our language, and gives us questions to clarify imprecise language.

(35) Metaphor: A story (analogy or figure of speech) told with a purpose, which allows us to bypass the conscious resistance of the client and to have the client make connections at a deeper level.

(36) Meta-Physics: is the branch of philosophy that examines the fundamental nature of reality, including the relationship between mind and matter, between substance and attribute, and between potentiality and actuality.

(37) Meta-Programs: These are unconscious, content-free programs we run which filter our experiences.

(38) Milton-Model (Language): Has the opposite intent of the Meta Model (Trance), and is derived from the language patterns of Milton Erickson. It is a series of abstract language patterns which are ambiguous so as to match our client's experience and assist her in accessing unconscious resources.

(39) Mind Read: Claiming to know the thoughts or feelings of another without specifying the process by which you came to know the information.

(40) Mnemonics: The study and development of systems for improving and assisting the memory.

(41) Modalities: refers to our internal representations, which relate to the five senses (Visual, Auditory, Kinesthetic, Olfactory, and Gustatory) plus our internal dialogue.

(42) Model: In NLP, a Model is a description of a concept or a behaviour, which includes the strategies, filter patterns, and physiology so as to be able to be adopted easily.

(43) Model of the World: A person's values, beliefs, and attitudes that relate to and create his or her own world.

(44) Optimization: the action of making the best or most effective use of a situation or resource.

(45) Patterns: is defined as a series of similarities that may link cases to an individual. In the psychology context, patterns refer to regularities or consistencies that are observed in behavior, thought, or emotion.

(46) Perceptual Positions: describes our point of view in a specific situation. First Position is our own point of view. Second Position is usually someone else's point of view. Third Position is the point of view of a dissociated observer.

(47) Performance: any activity or collection of responses that leads to a result or has an effect on the environment. It is the behaviour of an organism (the performer) when face with a specific task.

(48) Pitch vs. Timbre vs. Cadence vs. Rhythm:
"Pitch" is nothing else but the frequency of a sound.
"Timbre" is thesound quality or tone color; timbre is the characteristic that allows us to distinguish between one instrument and another, and the difference between vowel sounds (for example, long "a" or "ee").
"Rhythm" is the time element of music. A specific rhythm is a specific pattern in time.
"Cadence" is the same as rhythm.

(49) Predicates: are language, words and phrases that we currently use and indicate our preferred representational system.

(50) Preferred Representational System: representational systems that we prefer and process (think, organize, etc…) most information through it.

(51) Presuppositions of NLP: literally means assumptions.

(52) Primary Representational System: is the one we prefer to show our internal world through.
(53) Pseudoscience: Pseudoscience is a set of theories, methods, and assumptions that appear scientific, but aren't.
(54) Raspy: harsh and unpleasant to listen to.
(55) Rate of Perceived Exertion: the Borg Rating of Perceived Exertion (RPE) is a way of measuring physical activity intensity level.
(56) Representational Systems: the senses through which we experience the world i.e. through which we represent the information.
(57) Resource Anchor: when you want to boost powerful state of being. One that you do for yourself.
(58) Result: a thing that is caused or produced by something else; a consequence or outcome.
(59) Science: The systematic study of the structure and behaviour of the physical and natural world through observation, experimentation, and the testing of theories against the evidence obtained.
(60) Search Anchor: used to identify the source of a problem or issue.
(61) Stacked Anchor: a number of anchors stacked together to increase intensity of the required state.
(62) Steady: free from excitement or agitation; calm.
(63) Strategy: A specific sequence of internal and external representations that leads to a particular outcome.
(64) Structural Family Therapy: a type of family therapy that assesses the subsystems, boundaries, hierarchies, and coalitions within a family (its structure) and focuses on direct interactions between the family members (enactment) as the primary method of inducing positive change.
(65) Sub-Modalities: are the fine distinctions we make within each representational system.
(66) Tag Question: A question added after a statement, designated to displace resistance.
(67) TimeLine Therapy: A specific process created by Tad James, which allows the client to release negative emotions, eliminate limiting decisions, and to create a positive future for himself.
(68) Trance: any altered state of consciousness, for example a highly focused state of consciousness.
(69) Universal Qualifiers: Generalizations such as all, every, never, everyone, no one, etc…
(70) Unspecified Verbs: A verb that deletes specific information in any way as to how, when or where… They don't give enough information to let you know what is going on for them.
(71) Values: High-level generalizations that describe that which is important to you – in NLP sometimes called criteria.
(72) Venn Diagram: is an illustration that uses overlapping circles to show the logical relation between two or more sets of items.

(73) Visualization: the representation of an object, situation, or set of information as a chart or other image [or/and] the formation of a mental image of something.

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