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Brain - Ocular Coadjuvancy In Military Decision Dynamics

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Neuropsychology has made unequaled sensitivities into neuronal - focused substitutions that marshal behavioural investigation on Military 'Actors', representations and maxims. Impression that decisions are taken through rational or logical thought process have been exposed to questioning that analyze estimation during decision making. Are Military leaders (Actors) threatened by 'Decision Alarm'? Military leaders assume their decisions are rational, optimal and based on data in appreciation of decisional behaviour. Such propositions are now scanned under lens of psychological prisms. Issues like how decisional processes transgress in brain pathways, how brain considers sources of data and what intrinsic processes embody conflicting values have been explored to design 'rational' decisions.

Keywords: Decision Making, Coherent Brain Dynamics Brain and Ocular Movement.

'Passing Hot Potatoes Around in Circles? This is not the way Military decides. 'Shoot To Kill'. 'One Round One Enemy'. 'If You Sweat More in Peace, You Bleed Less in War'. This is what is avowed. Neuroscience represents and captures new knowledge. This innovative concept combines neuroscience and military leadership together in a way that entails emerging knowledge and the latest evidence from neuroscience, neuro - military leadership, neurobiology and positive psychology for brain-friendly military leadership. Military sciences have great impact on wide range of Military needs. With advent of high-performance computing, Military science has become an integral part of every scientific and engineering discipline. Computing, in form of simulations, now complements Military exposition and experiments as part of tried that is increasingly successful in understanding physical, biological and behavioral phenomena. Computing and simulation have become essential tools for Military of the future. Development of intelligent information processing makes possible a digitized battlefield. Real-time acquisition, representation, synpaper and distribution of vast amount of battlefield information are key ingredients of the digital battlefield. The long-term goal of Military's inquiry is to help Military develop enhanced capabilities for 21st century. Management plays an essential role in modeling systems, in analyzing and controlling complex phenomena, and in designing and improving systems of critical interest to Military. The objections of Military's efforts in basic inquiry are to provide a well-equipped strategic force capable of decisive victory in conflicts in Information Age. Advances in the areas of Military interest depend, in part, on advances in a number of Military disciplines.

A new paradigm for leadership is emerging - the thinking Military leader. A Military leader who isn't necessarily the person at the head of the organization, but the person who understands, develops, creates, engages and inspires others-that is how their work gets done. To be effective in today's complex and changing world, Military leaders need new insights and skills that up-end conventional thinking about human potential, trust, energy, initiative, and commitment. But working with people can be hard. We are all different, with different personalities, different values, and different beliefs. Sometimes those differences can cause us to become angry or upset and impair our ability to see a solution clearly. Understanding how to engage and influence the brains of others as a Military leader is essential in today's hectic and often challenging also. Emerging findings in neuroscience research suggests why inspiring and supportive relationships are important - they

help activate openness to new ideas and a more social orientation to others. In this connection, Military leader's actions can be transformed from 'results-orientation' toward a 'relationship - orientation'. Decision in Military elucidation is the discipline comprising philosophy, theory, methodology and professional practice necessary to address important decisions in formal manner. Decision Military exposition includes procedures, methods, and tolls for identifying, clearly representing, and formally assessing important aspects of a decision, for prescribing recommended course of action by applying maximum expected utility action axiom to a well-formed representation of decision, and into insight for decision maker. Inquiry in probability and statistics supports critical Military needs in decision making under uncertainty. Areas include probabilistic and statistical Military exposition of models of physical and operational phenomena of interest to Military and development of testing and estimation procedures.

Inquiry on Military modeling to meet these requirements is a challenging area. The fundamental concept of a system that can process artificially sensed information, make optimal decisions based on this information and well-defined objectives, and translate those decisions into actions is a guiding and unifying theme for basic inquiry in this area. The decision maker is influenced by factors; both internal and external. The environmental context in which a decision is made makes it difficult to associate personality traits with specific decision-making behavior. Internal factors that influence decision making include limited information processing and memory capabilities. These can result in biases in processing information such as anchoring or regency. The limitations can also result in decision making heuristics.

Objective

There is a need to appreciate the value of studying brain functions in the context of military leadership. There is a pre - requisite to use and interpret neuroscience-relevant psychometric tests, enhance competence along the line suggested by neuro-scientific readings and be able to be a part of brain friendly workplace. Objective is to monitor philosophy of biology in behavioural models towards understanding the neurobiological drivers that underlie behaviour and decision making of Military leaders by means of fundamental tools from Economics, Psychology, Neuropsychology, Management and Statistics. New imaging technologies have motivated studies of internal order of mind in how Military leaders think, observe and generate decisions. The paper aims to improve one's understanding of neuro-scientific developments as these relate to new military leadership. While the mainstream research on military leadership deals with conventional papers, the need for radical change requires application of brain-friendly techniques. Drawing on the recent developments in neuro-science, neuro-biology, neuro-military leadership, and positive psychology, the paper is geared to offer an innovative understanding of military leadership in general and transformational military leadership in particular. The other objective is to interpret neuroscience-referred new insights and learning that would encourage to leaders of tomorrow.

Problem Statement

Decisions and choices define human beings. How to introduce a 'decision'? In fact, what is a decision? Is it a beginning or an end to a specific contemplation? Do they have a biological basis; genetic, physical, neurobiology, evolutionary, physiological, informational, biological, scientific, philosophical, anthropological, clinical, humanities, neurophysics, behavioural and cognitive sciences, neurosciences, management, neuropsychology and neurophilosophy etc.? Do these have bio - philosophical computational connotation? Are they regulated by 'drivers' like the sense organs? Decision archetype is concerned with the perception underpinning a driver's choices. If yes, then who serves as a driver? Key revolution originates with rational information controlling. Final question is; are these networked neurologically (neural roulette), if mind, emotion, cognition and brain are arenas where dynamics of decision crafting play? What benchmark driver's a preference or prospect attitude should fulfill in any universal settings. This amounts to of rationality. Do these represent sweeping renaissance of some primary concerns in understanding biology of decision apparatus?

(Satpathy & Neena: 2019).

The military decision-making process in an iterative planning methodology to understand situation and mission develop course of action and produce an operation order or plan. Current inquiry in military decision making has tended to focus on either

- Cognitive aspects of decision making by individuals or teams,
- Computer models which establish probabilistic relationships between actions taken and effects achieved, them vary these through simulated scenarios to discover algorithms for optimizing the selection of a course of action, and
- Analytical game theory approach which attempts to develop Military models for understanding the decision process.

Models of decision making are usually not Military models but rather are descriptive of processes that humans may use to make decisions. Decision making in such high stress environments as a military operations center requires synchronization of available knowledge and information systems capabilities. Two such models are naturalistic model and analytic model. The naturalistic model is an adaptive decision models that, for dynamic situations, includes developing situational awareness, course of actions, acquiring data to confirm or refute situational awareness and decision making. The findings are usually based on interviews. The models have been used to develop training procedures and in artificial intelligence applications. The analytic model focuses on time of one decision; it tries to understand mechanisms for 'unreasonable' decisions. Investigating the effects of military decision-making process can be difficult due to limited access to participants and security classification issues. A qualitative approach for exploratory inquiry in this environment based on information landscape model and textual Military exposition methods is called for.

Purpose

Principal aim is to model battle-field managerial decision making by using tools from management and Military science. This proposal aims at, first, incorporate battle-field managerial science and psychology of management modeling approach, and second, awareness of evidences for multiple systems involved in decision-making. Purpose is to assess those ophthalmological investigations have stimulus on military actor's choice. Focus is to replicate philosophy of biology in military leadership decision research. Results demonstrate indications for extemporaneous counterfactual replication.

- How does a Battle-field manager decide in a state of vacillation?
- How does a Battle-field manager decide in a state of Risk and Probability?
- How does a Battle-field manager decide in a state of VUCA (Vulnerability, Uncertainty, Complexity and Ambiguity)?

Agenda that aid in exploring the above issues are: -

- How does a Battle - field manager decide in a state of vacillation?
- How does a Battle - field manager decide in a state of Risk and Probability?
- How does a Battle - field manager decide in a state of VUCA (Vulnerability, Uncertainty, Complexity and Ambiguity)?

METHOD

It presents ophthalmological investigations in military leadership decision neuropsychology. This includes hybrid modelling attempt with an empirical part. For clinical tests, a single - subject was chosen in which the subject served as his own control, rather than using another individual/group. Through computational approaches, attempt can be to clarify how leadership track realize 'simulation' in battle-field managerial decision-making. The paper contains the fundamentals of brain structure and function along with landmarks in brain research. Techniques of studying brain functions are presented. The neuroscience of cognitive planning and decision making is dealt with. In addition, a number of assessment tools are also introduced. The role of emotion and the neuroscience of self-regulation is a special feature of the paper. More importantly, the neuroscience of transformational military leadership forms an

essential component. This plan ventures to offer a model about relationship between rationality, emotions and underlying battle-field managerial underpinnings involved in decision-making. By characterizing effect of these influences, this study expects to gain insight into how battle-field computes models for decision -making. This work would attempt processes on concept of Military models of decision-making. Principal aim of proposed study is to model battle-field managerial basis of decision making by using tools from-management and Military science. Purpose is to elucidate principles and decision -making mechanism in battle-field interaction between variables of battle -field managerial -management decision processes. Focal point mangers craft decisions and decisions, understand mechanisms of decision -making and integrating interdisciplinary inquiry towards contributing to battle -field managerial decision.

The methodologies are

- Describe framework for supporting high-level military decision makers in devising and choosing among courses of action,
- Design framework to account for differences in context and may be called analytical / intuitive decision maker styles,
- Illustrate some particular analytical methods and tools can provide this support, and
- Draw implications for next steps in related inquiry and development.

Tools

Psychological sciences have great impact on a wide range of Military needs. The long-term goal of the Military's psychological research programs is to help to Military develop enhanced capabilities for the 21st century in areas such as materials, systems, testing, evaluation, acquisition, training, and logistics. Management plays an essential role in modeling systems, in analyzing and controlling complex phenomena, and in designing and improving systems of critical interest to the Military.

With the advent of high-performance computing, the psychological sciences have become an integral part of every scientific and engineering discipline. Computing, in the form of simulations, now complements analysis and experiments as part of a triad that is increasingly successful in understanding physical, biological and behavioral phenomena. Computing and simulation have become essential tools for the Military of the future. Development of intelligent information processing makes possible the digitized battlefield. Real-time acquisition, representation, synpaper, and distribution of vast amounts of battlefield information are key ingredients of digital battlefield. USMA Department of Psychological Sciences is actively engaged in research, consulting, and problem solving in the area of digitization of the battlefield.

The major technical objectives of Military's psychological research programs are to develop new psychological theories, methods for modeling, analysis, algorithms, design, and control of physical, biological, and cognitive processes, and to make possible future intelligent systems through progress in information processing. The objective of Military's efforts in basic research is to provide well-equipped strategic force capable of decisive victory in conflicts in the Information age. Advances in the areas of Military interest depend, in part, on advances in a number of psychological disciplines. The six components of Military psychological research are:

- Applied Analysis.
- Computational management.
- Probability Statistics.
- Systems and Control.
- Discrete Management.
- Intelligent Systems.

Many Military systems have long development cycles: five-, ten-or twenty-year horizons from conception to implementation. Accordingly, psychological research issues that play critical roles in the success of new systems have to be foreseen and addressed up to twenty years in advance. This proactive research stance requires constant interaction between researchers, Military development personnel, and Military field soldiers.

To be a valuable contributor, psychological

research must address realistic issues of potential long-term Military interest. We must accelerate the passage of new ideas from the theoretical stage to the implementation stage. The psychological sciences cannot just be a problem-solving activity conducted before, or in parallel with, developmental work. Psychological research must be interactive and collaborative with other sciences, engineering, and development activities to ensure that Military systems will be built quickly and will be built right the first time. Continuous technological collaboration is becoming a much more important mode of work than just being a specialist who adds value at one's assigned point of the development cycle and then passes the project on.We discuss some of the Military interests that lend themselves to solution through psychological research developments and the psychological topics involved in such work. We especially note the role that modeling plays in this effort by highlighting (through use of italics) sections where modeling is explicitly mentioned and explained. This article is rewritten for the undergraduate audience of this book from a booklet prepared by the Military Research office [1]. Some of the higher-level psychological subjects and scientific terminology excerpted from [1] and mentioned in our discussion may be unfamiliar to undergraduates. However, we hope all readers obtain a good view of the magnitude, flavor, scope, and importance of management in the Military management should refer to [1] and [2], specifically the sections in Chapter IV (Technical Developments) and Chapter V (Basic research).

Sample:

A single-subject design or single - case research design has been adopted. This was with the aim that the subject could serve as his own regulator. Behavior of subject was detected continually over progression of interposition ('Continuous Assessment'). Behavioural tendencies, if any, were recorded ('Baseline Assessment'). Since comportment was evaluated recurrently, single - subject scheme permitted to gauge vicissitudes in conduct over phase through workings of dynamic components. Such an arrangement as favoured as it was perceived to be very much elastic and could target variances in reaction to intercession effects. Equipment Used: Tobii ocular tracking equipment was used. This gadget is beam equipment that sorts it conceivable for a processor to discern where subject is observing, identify manifestation, responsiveness and concentration of subject. This permits for distinctive acumens into human comportment and what data we manner, to comprehend effects on decision behaviour and decision making. Findings and Observations decision making undercurrents of managers.

The resulting inferences attained were: -

- Ocular 'tracking' gives contributory signal all through judgement making progression.
- Ocular 'tracking' is a valued technique to evaluate commencement trials in a manager - focused decision procedure.
- Ocular engagements can be charted to inspect judgement - task key methodologies and cerebral assignment of managers.
- Ocular movement comfort managers to signify dynamic judgement making in a coherent approach.
- Robust dissimilarities in ocular movement demeanor signify judgement inevitability
- Perceiving oculomotor variables in judgement - task routine aids temporary circumstances of uncertainty.
- Ocular movements assist as a scheming procedure that goes yonder normal investigation.

Military Interests

The objective of Military basic research is to provide a well-equipped force capable of decisive victory in conflicts in the Information Age. To achieve this objective, advances in the following specific areas of application and modeling are needed:

- Advanced processes,
- Behavior of materials,
- Structures,
- Fluid flow

- Power and directed energy
- Microelectronics and photonics.
- Sensors
- Control and optimization
- Information processing.
- Interactive simulation
- Design and validation
- Automatic target recognition.
- Battlefield management.

Advances in these areas of Military interest depend, in part, on advances in a number of psychological science disciplines.

Major Components of Military Management

The six components of Military psychological research are:

- Stage 1. Applied Analysis
- Stage 2. Computational Management
- Stage 3. Probability and Statistics
- Stage 4. Systems and Control
- Stage 5. Discrete Management
- Stage 6. Intelligent Systems

The military decision-making process has seven steps.

- Step 1. Receipt of Mission.
- Step 2. Mission Military exposition.
- Step 3. Course of Action Development.
- Step 4. Course of Action Military exposition.
- Step 5. Course of Action Comparison.
- Step 6. Course of Action Approval.
- Step 7. Order Production.

In light of discussing theories and applications of battle-field managerial science in decision making, it is important to see what techniques are being used to study the battle-field. The military decision-making process (MDMP) is an iterative planning methodology. The Military design methodology is used for applying critical and creative thinking to understand visualizes and describes unfamiliar problems and approaches to solving them. Leaders integrate this aid to conceptual thinking methodology with the detailed planning. Measures of activity allow determining if evaluation process is centralized or if different battle-field systems compete to influence final decision. Methodology includes, use of battle-field managerial decision tasks and application of battle-field managerial scientific analyses. Attempt to simultaneously coherence model of battle-field managerial-management decision-making. The methodology is to develop theoretical foundations, models and algorithms to support near-optimal decision making in highly complex, dynamic systems, operating in uncertain, resource-constrained situation. Although, based on operations inquiry methodologies such as modeling, simulation and numerical optimization, this proposal is expected to include multi-disciplinary emphasis to accommodate complex, multi-dimensional decision framework.

Until now, inquiry has not systematically integrated influence of sub-systems in decision -making. Evidence suggests that decision making depends on methodical methods to analyze relevant processes. Due to its multidisciplinary nature, this investigation is subject to several kinds of misconceptions. Is battle-field managerial study of decision-making processes relevant for management? The debate argues that the question is of scientific interest and tools from management theory are well adapted to address it. While there are several benefits of using battle-field managerial techniques in understanding decision making, there are questions that battle-field managerial science cannot answer by itself and needs help off experimental methodology and theories to understand how Battle-field managers decide. The key limitation is identifying different regions of certain situations (VUCA). These techniques are not able to provide an explanation or a reason (battle-field managerial) as to why we respond in the manner that we do. What happens or what is activated when Battle-field managers make decisions or are in process of making decisions or responding to outcomes? It does not give insight into why we make decisions and why we respond in the manner that we do. This is where experimental methodology would help bolster understanding. A synergy

between battle-field managerial techniques and experiments provide insight into understanding Battle-field decision making.

High-level decision makers are commonly afflicted with deep uncertainties that materially affect the choice of a course of action but that cannot be substantially resolved by merely working harder. The purpose of this paper is to demonstrate that current doctrine, applied effectively through the Military Decision Making Process, is more than adequate to task of providing military planners the flexibility needed to develop plans and prosecute campaigns. It is proposed to discuss the problem with the current methodology used to compare and recommend courses of action to operational or tactical level commanders and describe and demonstrate how using this new methodology gives commanders a better tool to select those courses of action. It is proposed to provide additional Military exposition of the comparison that can provide the staff and the commander with actionable information generated from sensitivity Military exposition.

Unique Findings

Major finding is that Military actor attempts to decide and evaluates prospective decision using neuro - ophthalmological medium. This provides conceptual and philosophical framework for understanding and conducting research at intersection of brain and ocular - based models capable of predicting observed behaviour and build ideas capable of explaining and predicting decisions. Paper highlights growing interest in exploring potential links between human biology and psychology in explaining human behaviour. There is general agreement that psychological research is extremely important to Military. As reliability of simulations based on psychological, statistical, and information-theoretic models increases and as physical experiments become increasingly costly to carry out, need for contributions from psychological sciences increases. The focus of this discussion has been on the research in psychological sciences needed to achieve Military goals and support the Military in the field. In these roles, management is a valuable and effective force multiplier for the Indian Military.

Implications

This paper does not only bring together cutting-edge work in neuroscience and leadership behaviour. Its explicit discussion of benefits and limitations of neuroscientific methods will also offer readers an overview on potential applications and benefits in managing emotional capabilities.

Few implications can be explained under these dimensions;

- Helps to facilitate better decisions in corporations
- For academic point of view, how head, heart and body movement are synchronized in a holistic way
- It facilitates understanding power dynamics in different context and exercise the power accordingly.
- This study will help the common people for better negotiation and bargaining
- It can be widely used in other social sector for effective decision making

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