

**Effects of Leadership and Morale on the Outcome of the Battle alongside the Combat Power Elements Including Force Ratios**

**An Analysis With Artificial Intelligence**

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**Research Summary**

**What is research topic?**

This research will try to find the explanatory power of combat power elements including force ratios under the intermediating effects of Strategy, Leadership and Morale (intervening variables) for the outcome of the battle (dependent variable). I will try to determine the proportions of the variance estimated from the intervening variables.

**What will be the Research Questions?**

1st Question: What is the degree of explanatory power of combat power elements including force ratios on the outcome of the battles fought between state actors?

2nd Question-2: What is the leverage of leadership and morale on the outcome of these battles?

**What are the Research Objectives?**

I will develop a mathematical model which will identify explanatory powers of material and nonmaterial elements as predictors of victory or defeat at the battlefield. This research will yield the magnitude of the impact of the two most fundamental non-material components of combat (i.e. leadership and morale), on other elements of combat power and outcome of the battle.

For the 2 qualitative variable (leadership and morale) **I will use Natural Language Processing (NLP) technique.** This technique will allow key texts to be integrated to already prepared databases. This integration is planned to be executed by the vectorization of critical leadership and morale keywords with the help of NLP/Python Programming Language.

This subject is also worth to attention because; the ability of Python programming language have potential to exploit the already in place information to the level hard to imagine even at the end of the century. Calculation and analysis capability of this discipline that framed in the field “Data Science” provides useful tool for explaining the variables once more with different dimensions.

**How the subject analyzed till now?**

* In the beginning combat power and force ratio was a subject of skilled soldiers like Sun Tzu, Clausewitz and others. Their **experiences** was the source of knowledge in the area.
* In the 1900s, the subject attracted the attention of engineers like Lancaster. At this stage, **mathematical formulas** were used to explain the importance of the subject.
* With the rapid development of technology, the subject has become the subject of operational research. Researchers like Depuy and Briddle have examined the subject with the help of **well-designed mathematical models.**
* Especially Briddle added very important dimension to the subject with **inserting a non-material variable** to the research model, which is **force employment.**

**How is Conceptual Framework?**

Diagram

Description automatically generated

**What is new?**

Leadership and Morale never have been analyzed in quantitative manner in a comprehensive model. There is only one example in literature where Stephen Biddle put Force Employment to a model and analyzed its influence on the variance of the outcome of the battle.

It is my understanding that force employment is doctrinal part that every army should somehow incorporate to their training programmes. I think the way leaders use their force changes according to the features of the leaders and the mood of the soldiers. That’s why I be analyzing leadership and morale factors. So, this research will find its place in literature with expanding already in place knowledge of the subject.