The Correlation between Regional Expertise and Land Navigational Capabilities

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ABSTRACT

The objective of this research is to determine factors influencing regional expertise capabilities for future military officers. Regional expertise is one of the most important skills required for military or civilian experts working overseas in diverse environments of the world. This project focuses specifically on spatial orientation and land navigation skills that must be developed during military education and investigates relationship between these skills and the general regional propensity. In addition, this project will analyze how these relationships change with specific categories such as gender, major of study and general knowledge of physical geographical processes. Through the methodology created, this paper and presentation describes the findings associated with regional awareness and proficiency of individual cadets at the United States Military Academy (USMA). Some of these cadets will participate in the Study Abroad Program (SAP) and the Cadet Summer Training (CST) where regional expertise skills are necessary for maximizing learning experience from foreign regions. The analysis was conducted by applying Pearson correlation coefficient to data compiled from Land Navigation Training and Generalized Regional Assessment Tests. The findings replicate the opinions of researchers for identifying potential spatial understanding of regional awareness of place.

KEYWORDS: Regional Expertise, Spatiality, Land Navigation, Statistical Analysis

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INTRODUCTION AND BACKGROUND:

Regional competence of place and space is establishing a re-emergence in and around civil and military education systems. This recurrence is due to the overwhelming need for regional experts that can teach, coach, and lead in relationship to physical and human environments, hence the rationale for this study.

The Generalized Regional Assessment Test (GRAT) is an instrument designed to measure related aspects of geographic awareness to regional expertise especially one’s propensity to develop regional expertise skills. In addition, this tool evaluates the individual’s ability to synthesize distinct elements within geographic space: The natural-physical environment, the socio-cultural landscape, and the economies of scale. These unique estimations of spatial cognitiveness, allow for inferences about culture in relationship to these three conceptual realms discussed previously. For this study, the GRAT will permit us to gauge an individual’s aptitude for a geographic region in comparison to the scores provided by the individual Cadet’s summer land navigational training.

Before we begin to look at the relationships between regional expertise and land navigation, we will define the two concepts and provide a background for understanding why these particular performance objectives are necessary to civil and military operations globally.

Regional expertise has been defined through the Combined Joint Chief of Staff (CJCS, 2006) as having 40 credit hours of regional studies specific to a geographical location or as having a regional knowledge through multiple years of experience and exposure of a set region globally. Although this is an approach in quest of regional experts, it is very hard to provide those particular skill-sets to a geographical region around the world, especially when national interest is at the heart of the underlying principle. Here at the Center for Language, Culture, and Regional Studies (CLCRS) at the United States Military Academy (USMA) at West Point, regional expertise is defined as something more holistically. Siska (2012) defines regional expertise as the explanation to comprehending our world’s complex systems. This classification of regional expertise is the foundation of our Nation’s ability to understand, develop, and teach subject matter professionals for the future of global responsibilities.

Land Navigation on the other hand, is a compilation of proficiencies in multiple components. One has to become capable in map reading, compass measurement, dead reckoning, and terrain association, just to name a few of the individual challenges and tests (DA, FM 3-25.26, 2001). This study focuses specifically on spatial orientation from land navigation skills that must be developed during military education and investigates
the relationship between these abilities and the general regional assessment test (GRAT). Land navigation is a tool that continuously must be evaluated and performed in order to develop the skill-set necessary that all individual soldiers need to maintain. This essential concept of land navigation is very comparable to the fundamental foundation behind the synthesis of regional expertise (Siska and Hummel, 2011). Land navigation is part of a series of continuous training and development advancements of a Cadet’s military education while serving at the United States Military Academy (USMA). Each summer, the Cadet will become more familiar with these concepts and field objectives of orienteering and land navigation through faculty, staff, and cadet leadership. These uninterrupted improvements focus on the spatial awareness, comprehension, and understanding of place through the growth of the individual Cadet. As we continue to increase the Cadet’s ability to navigate successfully through space, we can also expand their comprehension of regional competence and expertise. Spatial analysis and thinking is a learned process that if correctly incorporated can yield extremely powerful results (National Research Council, 2006). These types of efficiencies are similar to those outcomes that civil and military operators require for more accurate orientation and regional expertise skills.

Regional analysis through space and place is one of the most influential training tools that civil or military personnel can attain. This intellectual capacity allows the individual to examine a particular area and recapitulate the spatial significant of that place (Getis et al., 2011). For years military leaders have been providing executive summaries for a region of interest based off of this regional analysis approach. By showcasing these fundamental advantages of regional analysis, members of our Department of Defense can become more knowledgeable and better suited for upcoming operations and events that necessitate National interest. This project will bridge the relevance between navigational skills and regional expertise through the understanding and comprehension of area analysis.

RESEARCH OBJECTIVES:

1. To determine potential regional expertise capabilities of future officers.

2. Establish the controls and factors that influence regional expertise.
METHODOLOGY:

This study provided three means of data accountability: Data Collection, Data Analysis and Interpretation, and Statistical Analysis. The Data analysis section compiled data from Cadet Summer Field Training 2012 which tested Cadet’s ability to navigate through the woods successfully based off of their previous summer’s training capstone. Each cadet develops a skill set of spatial understanding and awareness from the very first summer called Cadet Basic Training or CBT. Once the individual has successfully completed that portion of the Cadet Development training model, they are able to perform the Cadet Field Training exercise or CFT. This event does not take place until the Cadet’s rising yearling year or second summer. As the Cadet’s continue with their land navigational skill-set and development, their overall regional comprehension should also develop based off of their ability to conceptualize spatially. However, this does not automatically imply that the ability to navigate successfully in the environment correlates with one interest in regional expertise. Therefore this research contributes to understanding of this relationship especially if geographic orientation skills contribute to one’s interest to learn and understand regional differences.

Another important data collection tool that we added was the Generalized Regional Assessment Test (GRAT) which was created specifically through the Center of Language, Culture, and Regional Studies (CLRS) at West Point for their Study Abroad Program (SAP). Siska (2011) and (CLCRS), have been monitoring and collecting data from the GRAT before and after each SAP Cadet participates in the program and provides detailed data feedback to all parties interested at the United States Military Academy (USMA). For this particular research study, Menhart and others (2012) collected GRAT scores from all their Cadets enrolled in EV203 Physical Geography class. This is a core class requirement of all Cadets’ mostly in the yearling year, which allows for less bias data for analysis and interpretation, since the individual cadet’s taking the GRAT or being compared for statistical analysis with their scores from this summer’s CFT 2012.

DATA ANALYSIS AND INTERPRETATION:

By evaluating the variables of time, distance, speed, and score from the overall compilation of material within the land navigation and comparing them to the results of each individual’s GRAT score, using the Pearson’s Correlation Coefficient, we should be able to predict the factors that are strongly correlated with regional competence especially
we aimed to identify more specifically if orientation and learning physical geography correlated with regional propensity i.e. interest in world regions their natural-physical, socio-cultural and economic aspects. There are numerous unknown variables that are connected to regional expertise; their identification would provide an excellent knowledge base for department of defense and national security. As the process of globalization continues to increase the need for military leaders with global regional understanding (the “Renaissance man” effect) is also increasing.

**STATISTICAL ANALYSIS:**

The Pearson Correlation Coefficient was used for all variables measured and analyzed throughout this study. Below are a series of graphs and chart’s that help depict the relationship and regression between the Generalized Regional Assessment Test and skill-sets developed from ongoing military training during Land Navigation.

Pearson Correlation Coefficient

\[
\begin{align*}
    r &= \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n} (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^{n} (y_i - \bar{y})^2}} \\
    \end{align*}
\]

Variables:

- \( y_i \) = general regional test scores for each individual cadet
- \( \bar{y} \) = mean regional test scores for all
- \( x_i \) = time, distance and test scores for all
- \( \bar{x} \) = mean of time, distance, test scores from land navigation

\[
y = \beta x + \epsilon
\]

Ho: Regional expertise is function of “geographic orientation”

Time, distance and test scores represent “orientation” variable
RESULTS AND DISCUSSION:

From previous research it is already known that there is a substantial correlation between the generalized regional assessment test (GRAT) taken prior to Cadet’s studying abroad and once they have returned from their experience and exposure (Siska 2011). Hence traveling to another part of the world and spending several months in a foreign region increases one’s propensity for becoming a regional expert (Figure 1). The question arises are there also other variables that are connected to regional expertise? Due to the available data, we focused on geographic orientation and the possible connection to regional propensity. Discovering other variables can benefit military operations by providing leaders with the ability to make educated decisions during their deployment in foreign countries and save lives and properties.

![Figure 1. Comparison of GRAT scores from pre and post study abroad](image)

The orientation and navigation skills are one of the most important skills in military operation and cadets must develop these skills to use modern geospatial equipments such as global positioning system (GPS). Hence land navigation course provided data for this type of analysis. The time (how long it took them to find designated location), the distance that was covered in process of navigating to their goal were measured and recorded. In addition the average speed and overall grade from land navigation course were added to this analysis. The null hypothesis was that the results from the land navigation experiment are not correlated. On contrary, the alternative hypotheses states that propensity is significantly (positive or negatively) correlated to land navigation skills.
Below is a table with the comparison of all Pearson Correlation Coefficient tests run and the results compared GRAT to the Land Navigation test administered at the USMA CST.

<table>
<thead>
<tr>
<th></th>
<th>LAND NAV SCORE</th>
<th>LAND NAV DISTANCE</th>
<th>LAND NAV TIME</th>
<th>LAND NAV SPEED</th>
<th>PHYSICAL GEOGRAPHY GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAT</td>
<td>-0.05001</td>
<td>0.04979</td>
<td>0.14927</td>
<td>-0.08009</td>
<td>0.10879</td>
</tr>
</tbody>
</table>

Table 1. The Pearson Correlation Coefficient of the Generalized Regional Assessment Test and Land Navigation.

The first comparison analysis identified in Fig. 2, shows a slight correlation between Regional expertise and land navigational overall scores. This is a little different from what we initially expected from our research objectives however, this is a very good illustration that allows us to move forward in our hypothesis of truly finding the influences or factors of regional expertise.

![Figure 2: Comparison of GRAT and Land Navigation Score](image)

Land Navigational Distance also provided and showcased a slight correlation when compared with regional expertise. Although this comparison does not provide the outcome that we intended, more research needs to be conducted on this topic of orientation and distance as seen in Fig. 3.
The time that it took to successfully complete the Land Navigation Course (Fig. 4) also showed a positive correlation. This correlation and relationship still not provide the answer to the question of what factors influence regional understanding. However, there is a possibility that those who indicated higher scores in general regional propensity test took a longer time to find their location in land navigation course. The general regional propensity tests once ability to observe environment; hence it makes sense that people with good ability to synthesize environment spend more time finding their destination.
There was actually an inverse (negative) relationship between the speed at which the cadets completed the Land Navigational Course and that of the GRAT (Fig 5.). As indicated previously the cadets that have potential for regional expertise would take longer to reach their goal due to ability to be driven by synthesis i.e. tendency to notice details of natural and socio-cultural environment.

Another variable that was available during this study for this group were scores from physical geography course. The hypothesis here is that cadets that performed successfully in learning physical geography will also achieve higher scores in regional propensity test. Again a slight correlation was present nevertheless, not enough to prove a relationship and distinguishable factor for identifying regional expertise (Fig. 6). Originally we expected stronger correlation. The results however indicated that those who do well in physical geography are not performing highly in general regional scores.Apparently propensity and motivation for regional expertise is not necessarily driven by motivation to achieve higher scores in physical geography.
CONCLUSION:

The future military and business operations indicate a great demand for leaders that will be best suited for deployment in foreign regions. This study provided us with very good information during our initial investigation and search for identifying regional experts. As we continue this worldwide assessment of cause and effect for influences on regional knowledge, we must be certain to pay extreme attention to the natural abilities and proficiencies that resolve the regional expertise phenomenon. One thing that this study provided us with is that, this is the beginning of a study and research initiative that can provide results. These outcomes benefit us as a nation and potentially provide us with regional experts to safeguard our National Security and way of life.

One possible answer to ensuring and developing these types of regional experts is to provide all Cadets traveling abroad through the SAP or A-IADs the opportunity of completing the GRAT before and after International experience. Also it would be nice to identify Cadets that have a regional resentment. That is, they can understand and comprehend regional expertise however, they are not interested in studying world regions and there complexities. Moreover, the significance of identifying civil and military members that have these unique talents of synthesis, in a holistic approach, is vital to our future research and understanding of Regional Expertise. Our goal is the continuation and expansion of the regional expertise and securities of cultural environments (RESCUE) model.
that will provide methodology for understanding and working in diverse regions in the world and identify leaders that are best suited for this type of military or civilian operation.
BIBLIOGRAPHY


APPENDIX A

Acronyms

CLCRS: Center for Language, Culture, and Regional Studies
USMA: United States Military Academy
CST: Cadet Summer Training
CFT: Cadet Field Training
DOD: Department of Defense
GRAT: Generalized Regional Assessment Test
SAP: Study Abroad Program
CJCS: Combined Joint Chief of Staff