



# Towards an Understanding of the Commander's "Coup d'Oeil"

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“...the *idea of a rapid an accurate decision* ... based on an evaluation of time and space, received a name that refers to visual estimates only. ...But soon it was also used of any sound decision taken in the midst of action—such as recognizing the right point of attack, etc. *Coup d’oeil* therefore refers not alone to the physical but, more commonly, to the inward eye. The expression, like the quality itself, has certainly always been more applicable to tactics, but must also have its place in strategy, since here as well quick decisions are often needed. (Clausewitz, 1834/1989, p. 102, italics in original).



# "Coup d'oeil" is a form of expertise

- Clausewitz reserved the term "coup d'oeil" for "military genius".
- Our hypothesis is that it is a form of expertise that results from military education and training
- It should therefore manifest itself in the same manner as other forms of expertise
- We therefore decided to apply a standard paradigm used by psychologists in the study expertise

# The Chase and Simon paradigm

- The paradigm was first used to study expertise in chess
- In experiments following this paradigm, the participants are first asked to study a chess board with a number of chess men. They are then asked to recall what they just have seen by placing chess men on an empty chess board
- Variants of this paradigm has been used to study expertise in at least 19 different fields of expertise
- The results are consistent

# Results with the Chase and Simon paradigm

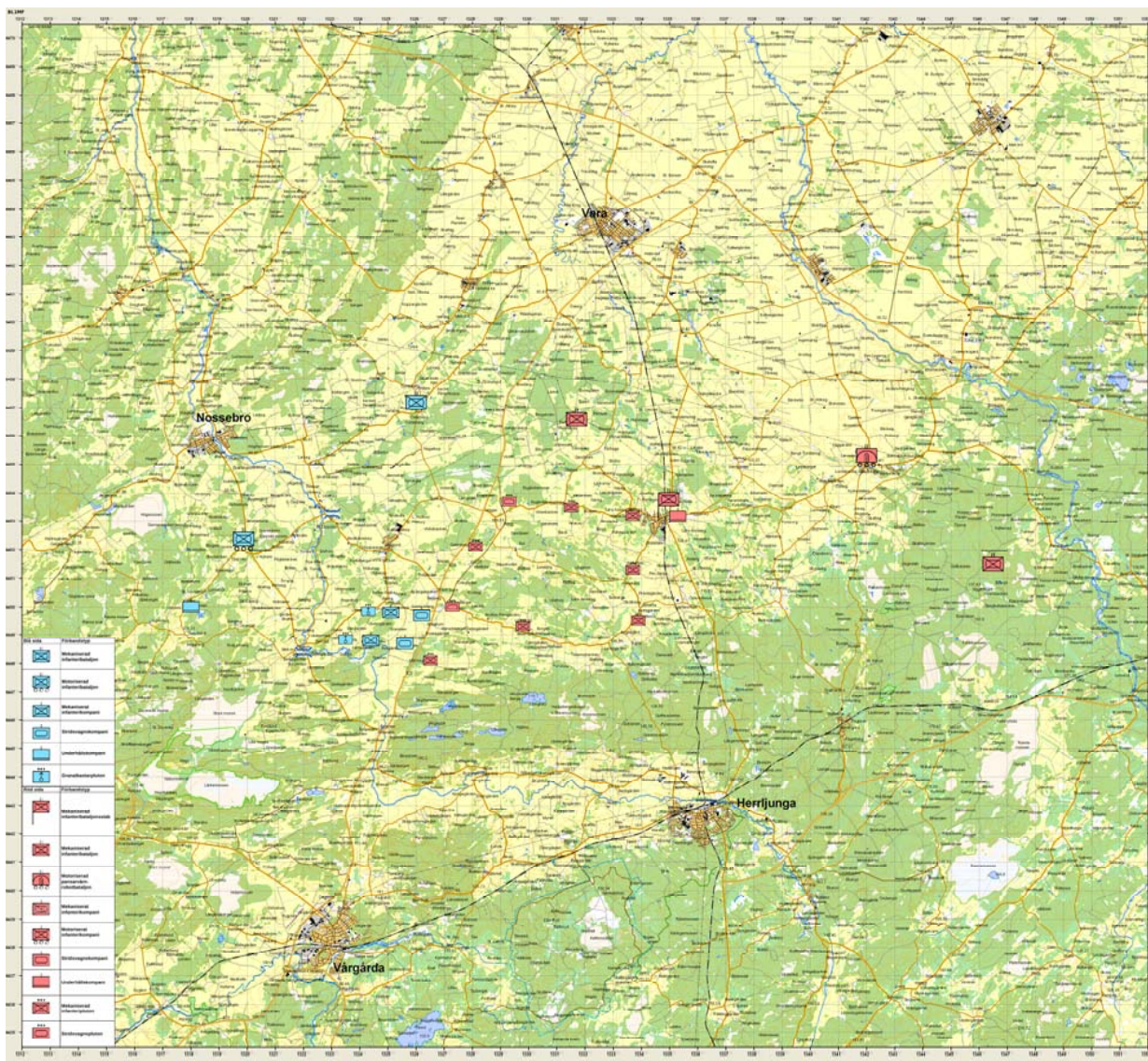
- The results differ for experts and novices
- For *meaningful* materials (such as chess positions resulting from a real game) experts recall the positions better than novices
- For *meaningless* materials (such as a chess board with randomly placed chessmen) there is no or little difference in performance between experts and novices
- These are the results we sought to replicate in the three experiments in this paper

# Experiments 1-3

- Participants
  - Experiment 1: 16 Army majors from the Higher Staff Course at the NDC (Experts)
  - Experiment 2: 16 second year Army cadets (Intermediate competence)
  - Experiment 3: 16 students of political science from NDC (Novices)
- In each experiment, the participants
  - studied a map showing a military scenario for 5 min. and were asked to write down what they thought that the red and blue sides were trying to achieve,
  - they were finally asked to recall what they had seen by placing military units on an empty map
- There were two scenarios
  - A meaningful scenario illustrating a possible military development
  - A meaningless scenario with (almost) random positions of the units
- Design
  - Each experiment followed 2(conditions) between subjects design



# Meaningful scenario



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## *Results:* Interpretation of the scenarios

The participants in all three experiments gave a similar interpretation of the meaningful scenario, but the interpretations by the experts were more elaborate

The interpretations of the of the meaningless scenarios varied widely between participants

*Results:* Reproduction of the scenarios  
(Mean closeness to target, maximum score  
230)

Meaningful    Meaningless

Experiment 1  
Experts

73.63	42.00	$p < .05$
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Experiment 2  
Intermediate

75.88	60.75	N.S.
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Experiment 3  
Novices

26.38	15.25	N.S.
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## Results: Summary

The results for the intermediate group (Exp. 2) replicate earlier results. That there is no difference between the meaningful and the meaningless scenarios suggest that there may well be at least two different ways of handling this task

The results for Experiments 1 and 3 (Experts vs. Novices) replicate earlier results and add one more variety of expertise to the set of 19 varieties that have been studied before

## Two hypotheses have been suggested

### *The pattern recognition hypothesis* (Chase & Simon)

- Experts have learned and stored a large number of patterns and interpret and store the scenarios in terms of one of these patterns and use it to reproduce the scenario. This is only possible for the meaningful scenarios, hence the better performance for these scenarios for the experts that have learned these patterns

### *The detection of constraints hypothesis* (Vicente & Wang)

- Experts learn to detect the constraints that characterize the domain (what is possible and not possible with military units) and use their knowledge of these constraints to reproduce the scenario as it must have been, guided by their interpretation of what the scenario is about. Such constraints are valid only for the meaningful scenarios, hence the better performance in these scenarios for the experts who have learned to detect them



# Are the hypotheses really different?

Patterns exist only for the meaningful scenarios (The experts have only seen such scenarios)

Only meaningful scenarios follow the constraints

No patterns, no constraints and vice versa

We nevertheless see the pattern recognition hypothesis as an unlikely explanation for military expertise

Learning patterns is a slow process, and officers simply do not have the amount of experience that is necessary for this

This casts doubt also upon the RPD model of military expertise, at least for higher ranking officers who seldom face the same problem twice

# A possible method for distinguishing pattern and constraints recognition

When only a "snap shot" of a scenario is shown it is not possible to distinguish between the two hypotheses

Dynamic scenarios offer a possibility, for even though the "snap shot" of the final positions may not offer the information required, being shown *how these final positions are reached* by a process that violates or does not violate constraints would provide that information

Experiments to test this hypothesis are currently being performed in our laboratory

We are also doing experiments to investigate whether experts and novices are able to extract whatever information they can extract under more time pressure, remembering Clausewitz's statement that any one could interpret a scenario given time, but only experts could do it quickly

but those results are for next year's ICCRTS

# Questions and/or comments?

