Historical Analysis for the Realistic Representation of Time in Combat Simulations

Dr. Dan Tilley C.Math MIMA

David Rowland

Paul Pearce

Contents

- The Problem
- What is Historical Analysis?
- Aim of study
- Data Collection
- Results
  - Corps/Divisional Agility
  - Average Advance Rates
  - Problems
- Conclusions
- Implementation

The Problem

- Wargaming
  - 1 or 2 sides, captures decision making processes
  - slow, not repeatable
- Simulations & Models
  - 1 or 2 simulated sides, quicker, faster, repeatable, more analysis
  - no human interaction
- Do not take full account of the effect of friction and pacing on sequencing of events

What is Historical Analysis?

Aim of Study

- Inform Combat Modelling & Wargaming
  - Improve Representation of Friction on
    - Pace
    - Sequencing of events
  - Calibrate pace of combat models

- 10 Historical Case Studies
  - 9 WWII & Gulf War
- Analyse
  - Advance Rates
  - Problems encountered

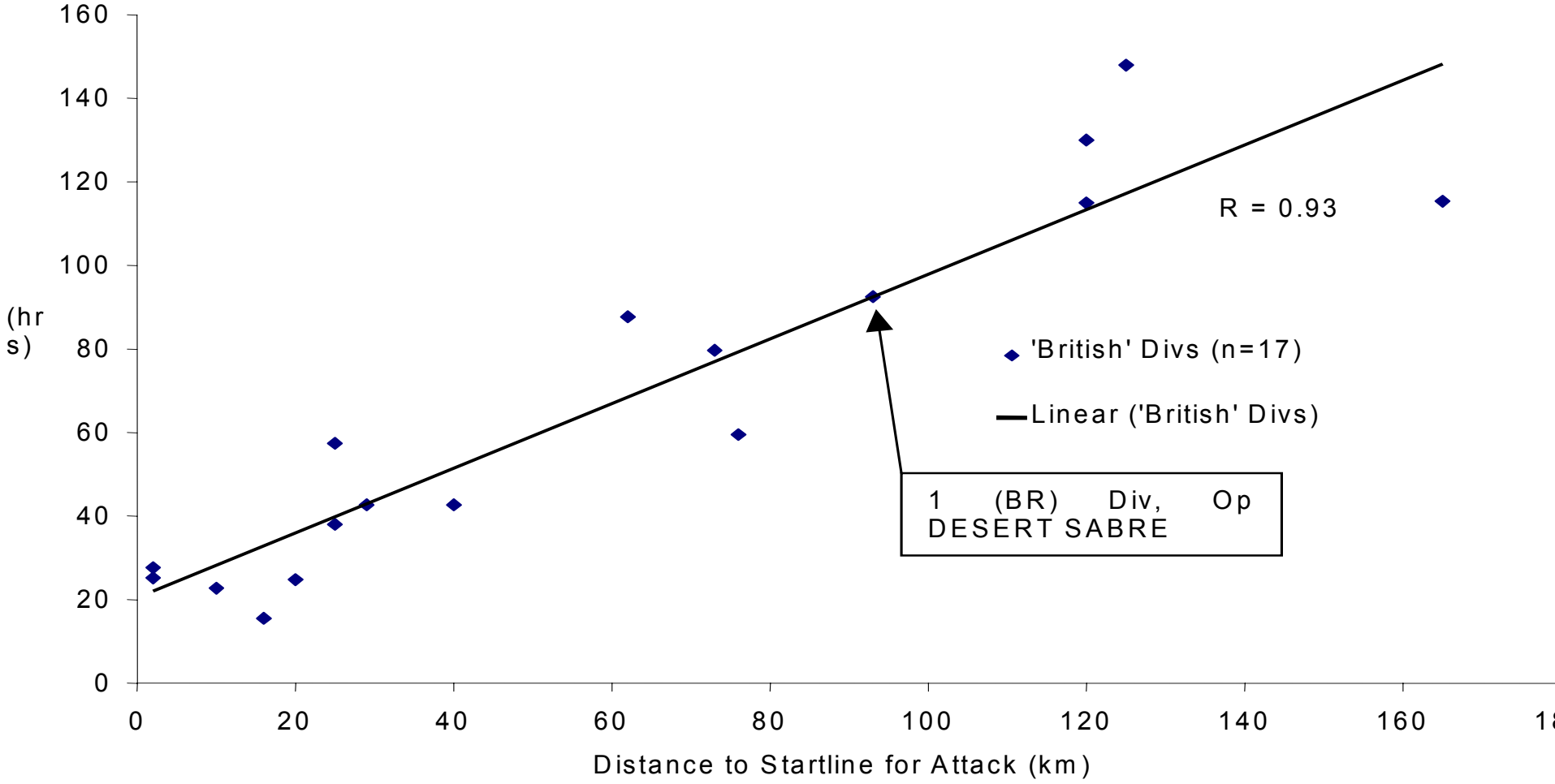
Data Collection I

- COMPASS, 8-12/12/1940 Sidi Barrani
- SUPERCHARGE, 1-4/11/1942 Alamein
- PUGILIST/SUPERCHARGE II, 2-27/3/1943 Tebago
- STRIKE, 5-7/5/1943, Tunis
- BLUECOAT, 30/7-9/8/1944, Normandy
- SUPERCHARGE IV (The Great Swan), 29/8-03/9/1944, France/Belgium
- BERESFORD, 1-2/9/1942, Alam Halfa
- YELLOW, 14-31/5/1940, Belgium/France
- OVERLORD, 6/6/1944, Periers Ridge
- DESERT SABRE, 25-28/2/91, Kuwait

Data Collection II

- Data Collected
  - Attacker
  - Defender
  - Scale of Attacking force (Corps, Division, Brigade)
  - Terrain
  - Advance Rates
  - Problems Encountered
  - In-depth Timeline of Operation
  - 5 Operations extended to include other offensives

Results: Corps Agility



Results: Corps & Div... Agility I

- From Corps Orders-Start of Op
  - T=21+0.77D R=0.93
- From Div... Orders-Start of Op
  - T=10.5+0.77D
- From Corps Orders-To Start (within Op)
  - T=3.7+0.49D R=0.87
- From Div... Orders- To Start (within Op)
  - T=2.9+0.17D R=0.89

Where T=time (hrs), D=Distance (km)

Results: Corps & Div... Agility II

- 0 KM
  - Before Op
    - Corps 21 hours
    - Div. 10.5 hours
  - During Op
    - Corps 3.7 hours
    - Div. 2.9 hours
- 100 KM
  - Before Op
    - Corps 98 hours
    - Div. 87.5 hours
  - During Op
    - Corps 52.7 hours
    - Div. 19.9 hours

Results: Gulf War Comparison

- Full Sample
  - Corps Before Op
    - (93km, 92.5hrs)
  - Div. Before Op
    - (93km, 82hrs)
  - Corps During Op
    - (2km, 4.68hrs)
  - Div. During Op
    - (2km, 3.24hrs)

- Gulf War
  - Corps Before Op
    - (93km, 92.5hrs)
  - Div. Before Op
    - (93km, 82hrs)
  - Corps During Op
    - (2km, 4.5hrs)
  - Div. During Op
    - (2km, 3.8hrs)

No Significant Difference

Results: Average Advance Rates

- Average 45% of plan (in terms of time) achieved
- Total daily distance averaged 66% of planned
- Many advances curtailed or failed

Problems: Command Caution

- Command Caution
- Successful offensives
  - Forward Command Style
    - 15-50% higher success probability
  - Willingness to take risks
  - Lead from front

Problems: Other Problems

- Command Interaction (50%)
- Terrain Appreciation (33%)
- Command Confusion, Co-ordination, Attack direction (67%)
- Congestion (100%)
- Minefields
- Friendly Fire

Conclusions

- Corps/Div. Orders before Op: Issued-Start
- Corps/Div. Orders during Op: Issued-Start
- Advance Rates to Start 45% Planned (in term of time)
- Daily Advance Rates 66% Planned
- Problems Encountered
  - Command Caution
- WWII Vs. Gulf War

Implementation

- Use Corps and Div. orders to Div. crossing times for receipt of orders to action as planning times.

- Calibrate the times for the crossing of start lines and use these to slow simulated forces during the in and out of contact phases.

Dstl is part of the
Ministry of Defence