

An Evaluation of the Analogy Between Nuclear and Cyber Deterrence

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Outline

- Frameworks and Methodology
 - Two Questions
 - Definition of Revolution in Military Affairs
 - Definition of Strategic Cyber Weapons
 - Interviews
- A Revolution in Military Affairs?
 - Successful case: Nuclear weapons
 - Unsuccessful case: Strategic Cyber Weapons
- A Strategic Deterrent?
 - Characteristics
 - Evaluation
- Future, Further Research, and Conclusion
 - Three paths
 - Research Opportunities

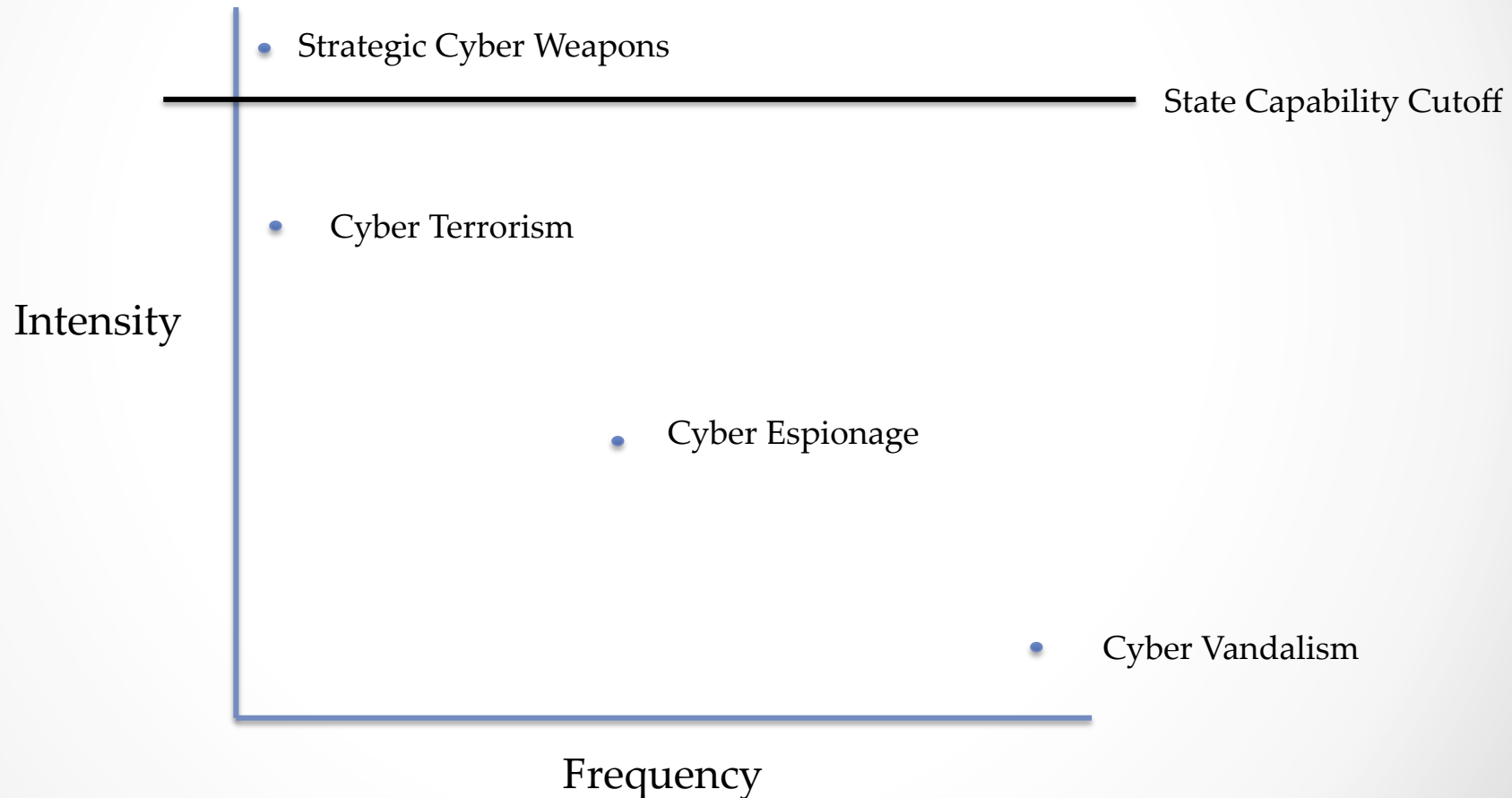
Two Questions

1. Do strategic cyber weapons constitute a revolution in military affairs?
2. Do strategic cyber weapons have the strategic deterrent characteristics of nuclear weapons?

Strategic Cyber Weapon

Malware that irreversibly neutralizes centers of gravity in cyber-dependent economic, military, and political systems and infrastructure

Severity of Cyber Threats



Revolution in Military Affairs

1. An advance in technology
2. An adaptation in military strategy or doctrine
3. A fundamental change in the balance of power on the battlefield either by the replacement of an old power or by the creation of a new one
4. A decisive victory

Interviews Conducted

- Barack Obama, President of the United States
- Robert Gates, Secretary of Defense
- Bill Perry, Secretary of Defense
- General Michael Hayden, Director of National Security Agency and Central Intelligence Agency
- Admiral Cecil Haney, Commander of Strategic Command
- General Bob Kehler, Commander of Strategic Command
- Admiral Jim Ellis, Commander of Strategic Command
- Kenneth Chennault, Chairman and CEO of American Express
- Anthony Earley, Jr., Chairman and CEO of Pacific Gas and Electric
- Chris Painter, Cyber Coordinator for State Department
- Michelle Markoff, Deputy Cyber Coordinator for State Department
- Dr. Phyllis Schneck, Deputy Undersecretary for Cybersecurity and Communications Department of Homeland Security
- Dr. Robert Jervis, Columbia University
- Dr. Thomas Schelling, RAND Corporation
- Dr. Martin Libicki, RAND Corporation
- Dr. Siegfried Hecker, Director of Los Alamos National Laboratories
- Dr. Sidney Drell, Deputy Director SLAC National Accelerator Laboratory
- Dr. Jackie Schneider, Elliot School of International Affairs
- Mark Ghilarducci, Director of California Governor's Office of Emergency Services
- Colonel Matteo Martemucci, 318th Cyberspace Operations Group, 688th Cyberspace Wing
- Colonel James Wakefield IV, Air Force
- Dr. Emily Goldman, Cyber Command
- Dr. Michael Warner, Command Historian, Cyber Command (on background)
- Kirk McConnell, Staff Member on Senate Armed Services Committee
- Kevin Gates, Staff Member on House Armed Services Committee
- Jim Lewis, Center for Strategic and International Studies
- Kim Zetter, Wired

Nuclear Revolution in Military Affairs

- Advance in Technology ✓
- Change in doctrine and strategy ✓
- Fundamental change in the balance of power ✓
- Decisive victory ✓

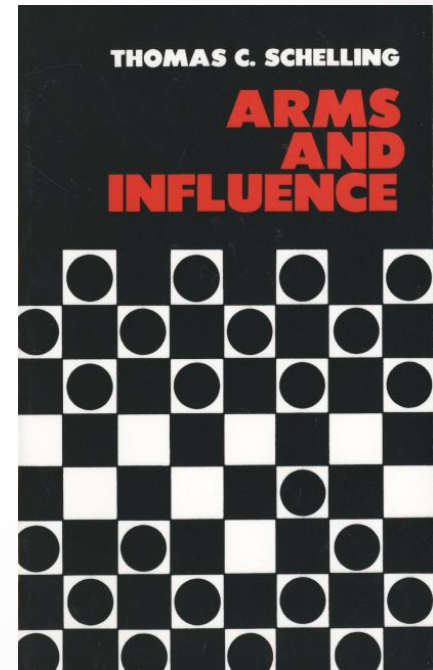


Cyber Revolution in Military Affairs

- Advance in Technology ✓
- Change in doctrine and strategy ✓
- Fundamental change in the balance of power ✗
- Decisive victory ✗



Strategic Deterrent Characteristics



Characteristics of Strategic Cyber Weapons



Future, Further Research, and Conclusion



Q&A

“Make no mistake, this weapon will change absolutely nothing.”

-French Director General of Infantry, commenting on
the machine gun before the French parliament, 1910