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*Panel:  
Toward More Comprehensive Wargame Adjudication*

*Speakers Notes:  
“Adjudication: the diabolus in machina of wargaming”*

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## Introduction

Traditional adjudication methods break down when wargaming operational or strategic problems, especially in novel situations for which we have little experience; for example information war in a regional nuclear conflict. The primary causes of this breakdown are the myth that player decisions during a wargame are useful and the failure to recognize the role of adjudicators as dominant players in the game.

Newtonian physics and the statistics of small unit actions provide rules for determining the possible outcomes of interacting player decisions when wargaming tactical level attrition warfare. The adjudicators either “roll dice” to pick one of those possible outcomes randomly as the one that actually occurred, or decide themselves which one occurred to force the players into a situation that best addresses the sponsor’s objectives for the game. However, we do not have the equivalent adjudication rules for wargaming novel operational and strategic problems. In these cases the adjudicators (who are no better informed than the players about how “the world works”) first have to decide the possible outcomes of interacting player decisions and then decide which one occurred. However, psychology research demonstrates that people cannot predict the decisions they would make under different information circumstances, and so decisions made during a game by players are unreliable predictors of decisions that would be made in the real world situation the game is attempting to reproduce.

When wargaming novel situations using traditional approaches the adjudicators not only decide how the world works but also decide what information is given to the players. They become dominant players whose actions and beliefs drive the game –diabolus in machina – resulting in game results which are seductively compelling but ultimately unreliable.

The solution is twofold. First treat the adjudicators as players whose behavior it is critical to analyze. Second, psychology research indicates that human beliefs are robust even in the face of contradictory evidence, and so focus the game design onto the beliefs of the players and how those beliefs drive their decisions, not on the actual decisions.

## Traditional wargame adjudication

Traditional attrition warfare is relatively simple to wargame and adjudicate. The outcomes of interacting player decisions are driven by physics (for example external ballistics, logistic flows, time and space factors etc.) and the statistics of millennia of small unit actions. We know these physics and statistics rules, and so adjudicators use these to identify the range of what could happen as a result of interacting player decisions. Adjudicators take account of the moral effects within the statistics if the wargame is a deductive game and decide themselves on the moral factors if the wargame is an inductive game.

For deductive games the adjudicators essentially roll the dice using established statistics to determine from the identified range of possible outcomes of interacting player decisions which specific outcome did occur to place the players into a new but valid situation in which to make their moves. Among their roles, adjudicators act as umpires ensuring the players do not break the rules of physics or statistics. For inductive games however, instead of rolling the dice to determine which of the possible outcomes of interacting player decisions did happen, they themselves choose from the range of outcomes which one did occur to place the players into a situation that forces them to deal with problems that address the objectives of the game’s

sponsors. In either case, deductive or inductive, the adjudicators also make the decision of what information about the outcome to provide each of the player teams.

### **Why do we need more comprehensive wargame adjudication?**

Many of the novel operational and strategic problems in which we are interested do not have an associated physics, case studies or statistics on which to base adjudication. For example, what are the rules (the equivalent “physics” and “statistics”) for identifying possible outcomes during an information war during a regional nuclear conflict? How many of these have been fought? I suggest zero is a reasonable answer (or near zero for most of the problems in which we are interested), and this means traditional adjudication techniques, based on traditional wargame designs, are inadequate. But, it is precisely this kind of problem, novel and dangerous, that we are most interested in wargaming and which it is most important for us to wargame given the potential costs of not understanding these kinds of problem to the best possible level.

### **Traditional adjudication applied to novel operational and strategic problems**

Modern novel operational and strategic level problems are driven by complex interacting political, military, economic, social, ideological and infrastructure (PMESII) effects, most of which we do not understand or at most have only an intuitive grasp, and certainly we do not have a statistically valid sample set of previous situations on which to draw.

So how do we currently adjudicate games that deal with these kinds of problem?

A common approach is to provide the adjudicators with advisors who are subject matter experts in the appropriate PMESII areas. These subject matter experts draw on the large body of political science theory base and models to provide the best judgment possible about areas that are relevant to the problem being gamed. Even given the existence of quantitative models associated with the political science theory base, deductive game design makes little sense for novel operational and strategic conflict situations since I claim there are insufficient past examples to provide useful statistics to inform the dice thrower. These situations call exclusively for inductive game designs. The adjudicators draw on the advice of subject matter experts to identify the range of possible outcomes to interacting player decisions. Then, in accordance with inductive design principles, they decide which of these outcomes did occur to place the players into a situation that forces them to deal with problems that address the objectives of the game’s sponsors, and finally decide what information about the outcome to provide the players.<sup>1</sup>

### **So what is the problem with traditional adjudication methods?**

Note however than in order to make the inductive selection of an outcome to push the players into situations which force the players to solve problems of interest to the game’s sponsors, the adjudicators have to forecast to some level what those players might do with the information they provide. The adjudicators (with their advisors) are attempting to forecast likely futures based on current information. But this is why we are gaming in the first place, because we do not understand the problem or the rules (unlike in traditional attrition warfare) that drive the novel operational or strategic situation. It is the players’ job in the game to illuminate the problem to provide insights and understanding, not the adjudicators’ job.

Adjudicators and their advisors make subjective professional decisions about the range of what could happen as a result of player decisions, make subjective professional forecasts about what

players might do in the future, and make subjective professional decisions about what information to provide the players. They do all this from a knowledge base that is as flawed and sparse as the players' knowledge base. At best the adjudicators have better subject matter experts as their advisors than do the players, which if true raises the question about why the game has not replaced the players with the subject matter experts.

It is clear that not only are the adjudicators and their subject matter expert advisors decision making game players, they are in fact the dominant players in the game given their control over who gets to know what. In addition there is significant logic to the suspicion that they lack the necessary expertise in the novel situations being gamed to adjudicate the game to justify a rethink of how we wargame novel operational and strategic problems. The adjudicators and their advisors are decision-making game players whose decisions are about "how the world works". But "how the world works" are also the rules for adjudication. So the adjudicators get to decide the rules of the game dynamically from a position of ignorance as the game proceeds.

### **People cannot predict their own decisions – let alone other peoples' decisions**

Research shows that "People are not aware of the reasons that move them; even an introspective person with incentives to estimate how he or she would have behaved with different information cannot do this".<sup>2</sup>

But this is precisely what we ask players in games to do, to "imagine you are in some future (or other) environment which is different from the real present one you know you are in (present day, and it's a game), and make decisions". We then try to draw conclusions about the decisions made in the game that are valid for decisions that might be made in the future or other environment. Since decision makers can't estimate their own decisions under different information then the players' decisions will not be a reliable indicator of the decisions they would make under future or non-game circumstances.

Since most people cannot accurately predict their own decisions, then they certainly do not make good predictors about other peoples' decisions, i.e. friendly or enemy forces decision makers who might actually be in position when the real world situation arises. Wargame red cells have serious problems if they are supposed to represent decision makers from other cultures. Mirror Imaging matters when we are interested in Blue decisions in the face of Red intentions, or are interested in Red decision making behaviors. Mirror imaging does not matter when we are interested in Blue decisions in the face of Red capabilities. In this case Red's decisions are simply to provide the most dangerous opponent possible to Blue within the context of the game objectives that Red capabilities permit while ignoring Red's cultural proclivities.

Obtaining experts in Red thinking generates several problems. Ex-patriots from Red countries of interest often have various political agendas, are not necessarily expert in their own country's political and military decision making styles (how many disgruntled Americans are truly expert on the political and military culture of the US?), and face security classification issues. US citizens who are genuinely expert in foreign cultures and who can obtain security clearance are rare, and we can only assume (not know) that their interpretations of foreign cultures are accurate.

## Skilled people are overconfident, and unskilled people are unaware of it

Adjudicators and their subject matter expert advisors are by definition unskilled at gaming novel operational and strategic problems precisely because they are novel, we have no statistics and the only case studies are analogical. Two effects demonstrated by psychology research work together to make this a serious problem for adjudication.

First, research shows that people in the lowest quartile of actual competency tend to self-assess themselves in the second to highest quartile; i.e. their incompetence robs them of the ability to realize they are incompetent. People in the highest quartile of actual competency tend to self-assess themselves slightly lower but within the highest quartile; they inflate their colleagues competency compared to their own.<sup>3</sup>

Second, research shows that older and more experienced people tend to be overconfident in their ability to control events that are in fact outside their own control while failing to realize the need for adapting their thinking. Their success in the past leads to confidence which in competitive situations can mask their lack of competency through successful bluffing. Their successful control of past situations leads them into the mistake of believing their competency applies to current situations of chance.<sup>4</sup>

So when wargaming novel concepts the game gets flooded with players, adjudicators and subject matter experts who not only are not expert, they confidently believe they are expert.

## Overconfident people believe they already know the answer

Three risk factors have been identified as present in nearly all cases of scientific fraud, these being the perpetrators “knew, or thought they knew, what the answer to the problem they were considering would turn out to be if they went to all the trouble of doing the work properly; were under career pressure; and were working in a field where individual experiments are not expected to be precisely reproducible.”<sup>5</sup>

The first factor is likely present for senior more experienced people, i.e. precisely the sort of people invited to be adjudicators or subject matter expert advisors, given the results of the psychology research just presented. Older and more experienced people tend to be unaware of their lack of skills in novel situations and tend to be overconfident. The second factor is often though not always present among players, and the third factor is clearly a characteristic of wargaming.

The three risk factors for fraud must be considered to be likely present when wargaming novel operational and strategic problems that are important, if using senior officers and civilians as players, adjudicators and subject matter experts.

## Summary of the problem

We need to wargame novel operational and strategic problems, but using traditional wargame design risks overconfident and under qualified adjudication resulting in decisions that are seductive, compelling but unreliable.

Adjudicators are diabolus in machina, and must be exorcised.

## What is to be done?

The key to wargaming novel operational and strategic problems is a set of four observations: “we tend to perceive what we expect to perceive; mind sets tend to be quick to form but resistant to change; new information is assimilated to existing images; and initial exposure to blurred or ambiguous stimuli interferes with accurate perception even after more and better information becomes available.”<sup>6</sup> In summary, beliefs are remarkably robust, even under contradictory evidence.

Therefore I hypothesize that beliefs identified during a game can be used as predictors for how players (including adjudicators) would interpret information in the real world.

I propose that wargaming novel operational and strategic problems should follow two principles. First, explicitly treat adjudicators as players to be analyzed. The analysts should treat adjudicators and their subject matter experts as players and analyze their moves along with the traditional players. Second, design the game and adjudication as a signaling game in which messages sent are compared with messages received. Player decisions exist simply to force the players to confront new information and to send messages by the actions they take. Since beliefs are robust and underlie intentions, messaging, and the (mis)interpretation of messages, the analysis of intentions, messages sent and why, and message (mis)interpretation will provide reasonable predictors for similar activities in the real world.

Game design should focus on: why decisions were made and not made (not what decisions were made); what messages the players were intending to send by their decisions and what messages were received; what behaviors they wanted from the other players resulting from their decisions and what behaviors they instead obtained.

Analysis should examine the disconnects between expectations and results, and player responses to the differences between these two, with the hypothesis that the beliefs driving expectations and responses are robust and therefore reasonable predictors of beliefs those players would bring to the real world.

## Example: DEGRE 2009

Every year the Mahan Scholars (a research group at the US Naval War College which focuses on nuclear issues) and USSTRATCOM sponsor a nuclear wargame run by the Wargaming Department of the College. Although the content of the game is classified, the game design is not. In 2009 the game design explicitly followed the second of the two design principles proposed above, specifically the game was designed (adjudication and analysis) to be a signaling game.

Data collection (and hence analysis) focused on messages players intended to send by their actions and the interpretation of messages received in the following move, the decisions they wanted the adversary to take based on the messages sent and the actual decisions made by the adversary in the following move, own beliefs about oneself and the adversary for all sides. The adjudicators were diabolus in machina, deciding (based on their own beliefs and guidance from subject matter experts who were by definition inexperienced in fighting nuclear wars) what should happen and what information should be provided to the players.

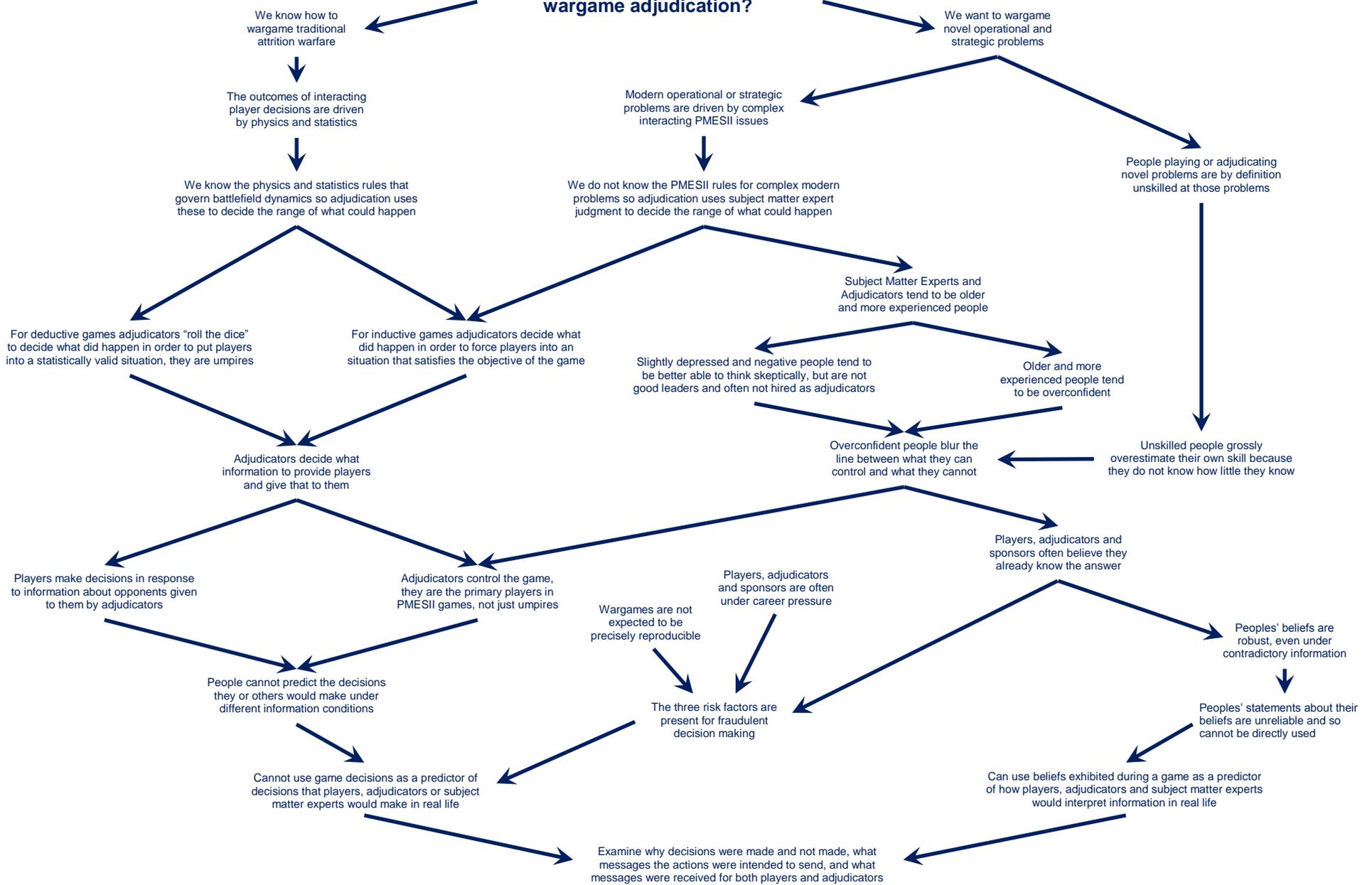
The game design did not explicitly analyze the adjudicators and their subject matter expert advisors as players; however the design is easily extended to do so by collecting the same

“signaling information” from the adjudication cell and their subject matter expert advisors as from the traditional player cells.

<b>Player (move)</b>	<b>→</b>	<b>Player’s Adversary (following move)</b>
<b>Thread / Story Component</b>		
Intended Effects → Own actions executed	← compare →	Adversary Actions executed
<b>Possible Drivers of Adversary Actions in following move</b>		
Messages sent by Player	← compare →	Messages received by Adversary
Player beliefs about self and adversary	← compare →	Adversary beliefs
Player assessments of risks and unintended consequences		

# Adjudication: the diabolus in machina of wargaming

## Why do we need more comprehensive wargame adjudication?



<sup>1</sup> As pointed out by Jon Compton and Yuna Wong at the Connections 2011 conference, it is a professional requirement for wargame designers to be familiar with the political science theory base and models in order to provide adjudicators with the range of possible outcomes and provide the adjudication cell with advice on which outcome to choose to support the sponsor's objectives.

<sup>2</sup> “*Reports, Politics, and Intelligence Failures: The Case of Iraq*”, *Journal of Strategic Studies*, Vol. 29, No. 1, 3 – 52, February 2006 online at [http://www.tandf.co.uk/journals/pdf/papers/FJSS\\_LR\\_3-52.pdf](http://www.tandf.co.uk/journals/pdf/papers/FJSS_LR_3-52.pdf) (last visited 7/8/2011). See also “*Understanding Beliefs*”, Jervis, R., *Political Psychology*, vol. 27, Fall 2006.

<sup>3</sup> “*Unskilled and unaware of it: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments*”, Kruger J, Dunning, D. *Journal of Personality and Social Psychology*, 1999, Vol. 77, No. 6. ] 121-1134 online at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.64.2655&rep=rep1&type=pdf> (last visited 7/8/2011). See also “*Strangers to Ourselves: Discovering the Adaptive Unconscious*”, Timothy Wilson, Harvard University Press 2002.

<sup>4</sup> “*Military Misfortunes: The Anatomy of failure in War*”, Eliot Cohen and John Gooch, Free Press 1990. “*Cocksure: Banks, battles, and the psychology of overconfidence*”, Malcolm Gladwell, *The New Yorker* July 27, 2009 online at [http://www.newyorker.com/reporting/2009/07/27/090727fa\\_fact\\_gladwell](http://www.newyorker.com/reporting/2009/07/27/090727fa_fact_gladwell) (last visited 7/27/2011)

<sup>5</sup> “*On Fact and Fraud: Cautionary Tales from the Front Lines of Science*”, David Goodstein (vice Provost Caltech), Princeton University Press, 2010. See review online at <http://www.scientificamerican.com/article.cfm?id=when-scientists-sin> (last visited 7/27/2011).

<sup>6</sup> “*Psychology of Intelligence Analysis*”, Richards Heuer, CIA 1999, online at <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/psychology-of-intelligence-analysis/index.html> (last visited 7/27/2011).