Implementing the Cultural Dimension into a Command and Control System

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Project Calling Card

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Advice to Warfighters: Understand Culture

You have to understand the culture that you're operating in... You also have to understand the dynamics that are going on within that culture, within the region, and be careful that what you think you're about to do may be entirely different than what you unleash.

--General Anthony Zinni
U.S. Marines (Ret.)
Former Commander, US Central Command

Hearts and Minds

- Provide Greater Access to Electricity
- Improve Access to Health Care
- Improve Roads
- Build Wells
- Improve Schools
FULL SPECTRUM OPERATIONS

When choosing between courses of action a leader must consider the impact on the attitudes of people.

People’s attitudes are driven by their multi-faceted and evolving identities. As such, responses are difficult for leaders to predict.
SCIPR: COA Assessment Tool

Easy to Use Data Entry Interface

- How will group membership change in response to events?
- Which identities change most in response to events?
- Which sequence of events changes attitudes in desired direction?
- Which sequence of events changes attitudes fastest?

SCIPR Architecture

- Create Initial Population
  - Identities
  - Regions & Populations
  - Opinions of Interest
  - Dependent Identities
  - Opinions by Identities
  - Contact Network
  - Scenario

- SCIPR Model
  - Influence Triggers
  - Social Contact

- Social Dynamics
  - Change in Group Strength

- Change in Key Attitudes

- Social Influence

- Population Region Opinion Database
  - Baseline Scenario Model Interactions

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SCIPR Analysis

Potential Perceived Actors

- US Forces
- Local Government
- NGO
- UN Forces

Potential COAs

- Improve Access to Health Care
- Improve Access to Electricity
- Improve Schools
- Improve Roads
- Road Blocks
- Close Border

Forecast

- Change in Local Population’s Attitude
- Identities that Are Most Open to Change
- Change in Group Membership

Approach

Software tool built on an agent based model that presents the predicted attitude of individuals in response to selected events.

Model Based on Social Identity Theory (Tajfel 1978) & Self Categorization Theory (Tajfel & Turner, 1979)

Event

Identity Groups Update Attitudes Based on Group Membership

Individuals Update Attitudes to Align With Attitudes

Identity Groups Revise Attitudes to Enhance Allegiance

Event Occurs

Identity Groups Update Attitudes in Reaction to Event
Tenants of Social Identity and Self Categorization Theories

- Each of us perceive ourselves as belonging to multiple groups; each of which is an identity.
- We take actions in response to these perceptions.
- We change our identities and opinion in order to:
  - Improve self esteem
  - Decrease uncertainty about the world
  - Conform to social influence

Modeling Approach

- Agent Based Models
  - Continuous Opinion Dynamic Models
  - Bounded Confidence Models

Most Popular Way to Study Social Influence Using Agents

- Deffuant, 2006; Deffuant et al., 2002; Hegselmann & Krause, 2002; Salazar, 2008
Social Dynamics

Social Identity and Bounded Confidence Theory Guide the Dynamics of Opinion and Identity Change

- Identity Status
- Cognitive Identity Memberships
- Similarity between Identities Opinions and Personal Opinions
- Gap Between Senders Opinions and Personal Opinions
- Sender and Personal Similarity Effect on Opinion Change
- Change in Personal Opinion Towards Sender
- Migrating toward the Norm Opinions Loop
- Evidence Builds Certainty Loop
- Personal Certainty Growth
- Similarity Between Sender and Personal Identity Memberships
- Loosing Certainty Loop
- Bounded Confidence Effect on Opinion Change
- Personal Opinion Certainty
- Decay in Personal Opinion Certainty
- I Listen to My Friends and Join Identities Like Me Loop
- Potential Opinion Adjustment

Potential Opinion Adjustment

- Potential Gap Adjustment
- Receiver's Opinion
- Sender's Opinion
- 100% Against Neutral 100% For
- Personal Opinions
- Gap Between Senders Opinions and Personal Opinions
- Migrating toward the Norm Opinions Loop
- Change in Personal Opinion Towards Sender
- Sender: Contact from Network or Event
Certainty Effect

- **Sender:** Contact from Network or Event
  - Bounded Confidence Effect on Opinion Change
  - Gap Between Senders Opinions and Personal Opinions
  - Balancing
    - Opinion Change is Bounded by Certainty Loop
    - Change in Personal Opinion Towards Sender

- **Personal Opinion Certainty**
  - Certainty Distance
  - Receiver’s Certainty Bounds

- **New Potential Gap Adjustment From Certainty Effect**
  - Evidence Builds Certainty Loop
  - Balancing
    - Opinion Change is Bounded by Certainty Loop
    - Change in Personal Opinion Towards Sender

Identity Similarity Effect

- **Sender and Person Similarity Effect on Opinion Change**
- **Personal Certainty Growth**
- **Evidence Builds Certainty Loop**
- **Balancing**
  - Opinion Change is Bounded by Certainty Loop
  - Change in Personal Opinion Towards Sender

- **Receiver’s Identities**
  - Male
  - Republican
  - Employed
- **Sender’s Identities**
  - Female
  - Republican
  - Employed

- **Actual Gap Adjustment From Certainty & Identity Effect**
- **Receiver’s Identities**
  - Male
  - Republican
  - Employed
- **Sender’s Identities**
  - Female
  - Republican
  - Employed
Certainty Adjustment

- Actual Gap Adjustment
  - 100% Against
  - Neutral
  - 100% For
  - Receiver’s Certainty Bounds

- Sender: Contact from Network or Event
- Balancing
  - Migrating toward the Norm Opinions Loop

- Gap Between Senders Opinions and Personal Opinions
  - 100% Against
  - Neutral
  - 100% For
  - Receiver’s New Certainty Bounds

- Personal Certainty Growth
- Evidence Builds Certainty Loop
- Bounded Confidence Effect on Opinion Change
- Opinion Change is Bounded by Certainty Loop

Average Behavior

- Time
  - Opinion
  - Average of Sender Opinions
  - 100% Certainty

- Time
  - Certainty
  - Sender: Contact from Network or Event
  - Migrating toward the Norm Opinions Loop
Certainty Decay

- Decay in Personal Opinion Certainty
- Bounded Confidence Effect on Opinion Change
- Evidence Builds Certainty Loop
- Personal Certainty Growth
- Change in Personal Opinion Towards Sender
- Migrating toward the Norm Opinions Loop
- Evidence Builds Certainty Loop
- Balancing Opinion Change is Bounded by Certainty Loop
- Change in Personal Opinion Towards Sender
- Time Certainty
- 100% Certainty

Identity Changes

- Similarity between Sender and Personal Identity Memberships
- Cognitive Identity Memberships
- Identity Status
- Similarity between Identities Opinions and Personal Opinions
- Average Opinion of Current Identity Members
- Agent’s Opinion
- Gap
- 100% Against
- Neutral
- 100% For
- Personal Opinions
- Change in Personal Opinion Towards Sender
- I Listen to My Friends and Join Identities Like Me Loop
- Sender and Person Similarity Effect on Opinion Change
- 100% Certainty Opinion Activity
- 100% Opinion Activity
Identity Comparison

Opinion 1
Agent's Opinion
Gap
Average Opinion of Current Identity Members
100% Against
Neutral
100% For

Opinion 2
Gap
100% Against
Neutral
100% For

Opinion …

Identity Status Effect

Average Opinion Agreement
100% Agreement

Cognitive Identity

Identity Status: High High Low

100% Agreement
Event Reaction Mapping

Events

US Provides iPods

US Enacts Curfew

Opinions

Reactions

Identities

Gender
- Male
- Female

Religion
- Sunni
- Shiite
- Sufi

Employment
- Employed
- Unemployed

Agent Reacting to an Event

Event

US Provides iPods

Agent

US Forces

100% Against

100% For

Actual Gap Adjustment From Certainty Effect

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Multiagent Reactions

US Provides iPods

Agent

Male

US Forces

Sunni

Employed

US Forces

Opinion

US Forces

100% Against

Social Only

Event

Network Contact

Proportional Representation of Identity Groups Across Locations

Agent Network Contact

Changing Identity Membership

Identity Key

Graphical Representation of COAs and Other Events On The Ground

SCIPR Simulation - Identities

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SCIPR Simulation - Opinions

Agent Opinions and Certainty

Changing Opinions by Identity

Opinion Key

SCIPR Simulation - Results

Identities/Affiliations

Opinions/Attitudes

Interact

Emerge