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Report Documentation Page

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Si ne petes veritatem, Nulli quaerere nos

Developing Irregular Warfare Human Terrain Data Input for an Agent-based Model

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**Operations Analysis Division (OAD)
Marine Corps Combat Development
Command (MCCDC)**

**76th MORSS
WG-32**



Agenda

- **Irregular Warfare Project: Mission and Goals**
- **Scenario Background**
- **Data Acquisition**
- **How IW Data is used in our Model**
- **Pythagoras results**



Irregular Warfare Project: Mission and Goals

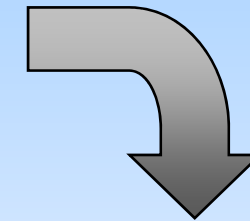
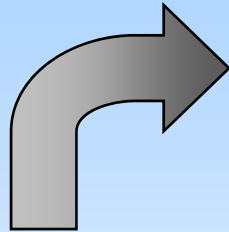
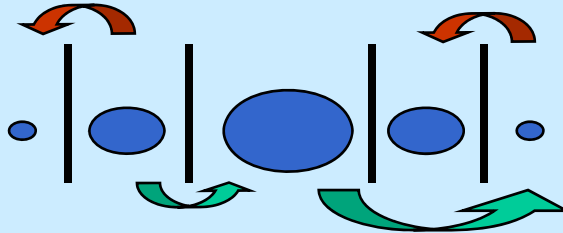
Project Goal: Develop a prototype methodology for analyzing a USMC IW problem in-house



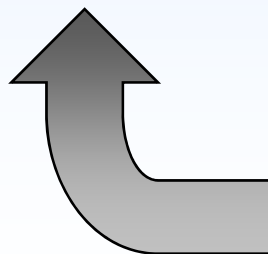
OAD IW Project

The “Khaldun Approach”

Conceptual Model (CM)

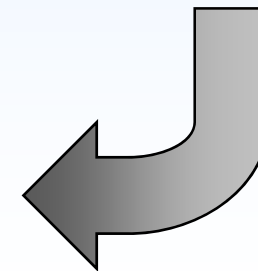


Review/Refine CM

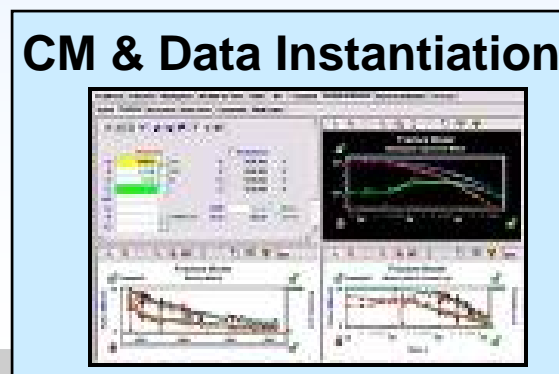


The
Khaldun
Approach

Data Development



CM & Data Instantiation





Colombia Scenario



- Background
- MAGTF Mission:
 - Refugee Camp Security
 - Humanitarian Assistance / Disaster Relief
- 2 Possible Courses of Action (COAs)
 - Sea-Based
 - Shore-Based

Provide:

Joint “Cultural” Prep of the Operational Environment
Plausible Range of **Civilian Population Behaviors**



Colombia

Population Segments



- Illicit Organizations
- Catholic Church
- Police
- Military
- Displaced Persons
- Urban Poor
- Urban Middle Class
- Old Money

Cultural Behavioral Data

- Orientation (Initial, Tendency)
- Impact Of MAGTF COAs
- Influence Of Population Segment Interactions



Data Required

Step 0: Define population segments

Elicit data for each population segment

- 1. Natural tendency of the population segment**
 - The population segment's narrative with respect to the insurgency
- 2. Effect of current events on population segment (impact)**
 - How the population segment reacts to a given COA
- 3. Effect of other population segments on a population segment (influence)**
 - How the population segment reacts to the narratives offered by other population segments

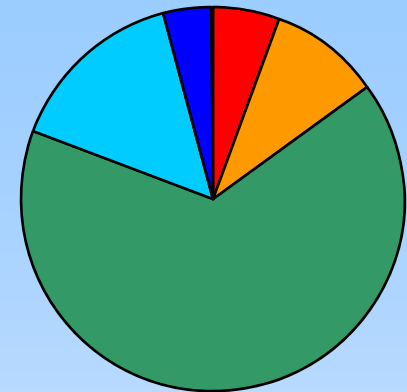


SME Interviews

- **Selecting SMEs**
 - 2 SMEs obtained via MCIA
 - SME credentials
- **Analyst & cultural SME communication challenge**
 - Analysts need numbers, e.g., probabilities, percentages
 - Cultural SMEs are non-quantitative thinkers



Orientation Data



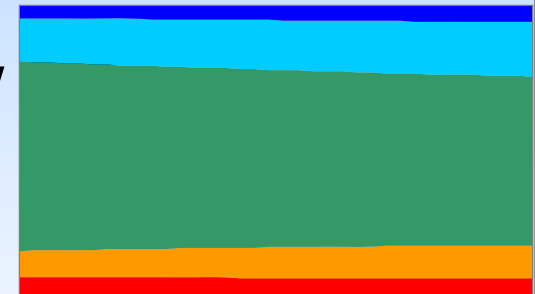
- **Initial orientation**

- “How do the actions of this population segment support the insurgency (FARC) or the Government of Colombia (GoC)?”

	FARC	Pro-FARC	Neutral	Pro-GoC	GoC
Urban Poor	5.8%	9.2%	65.7%	15.1%	4.2%

- **Natural tendency of orientation**

- “Given no external influences, over time, how would the actions of this population segment change to support the FARC or the GoC?”
- Captured as data for a Markov transition matrix

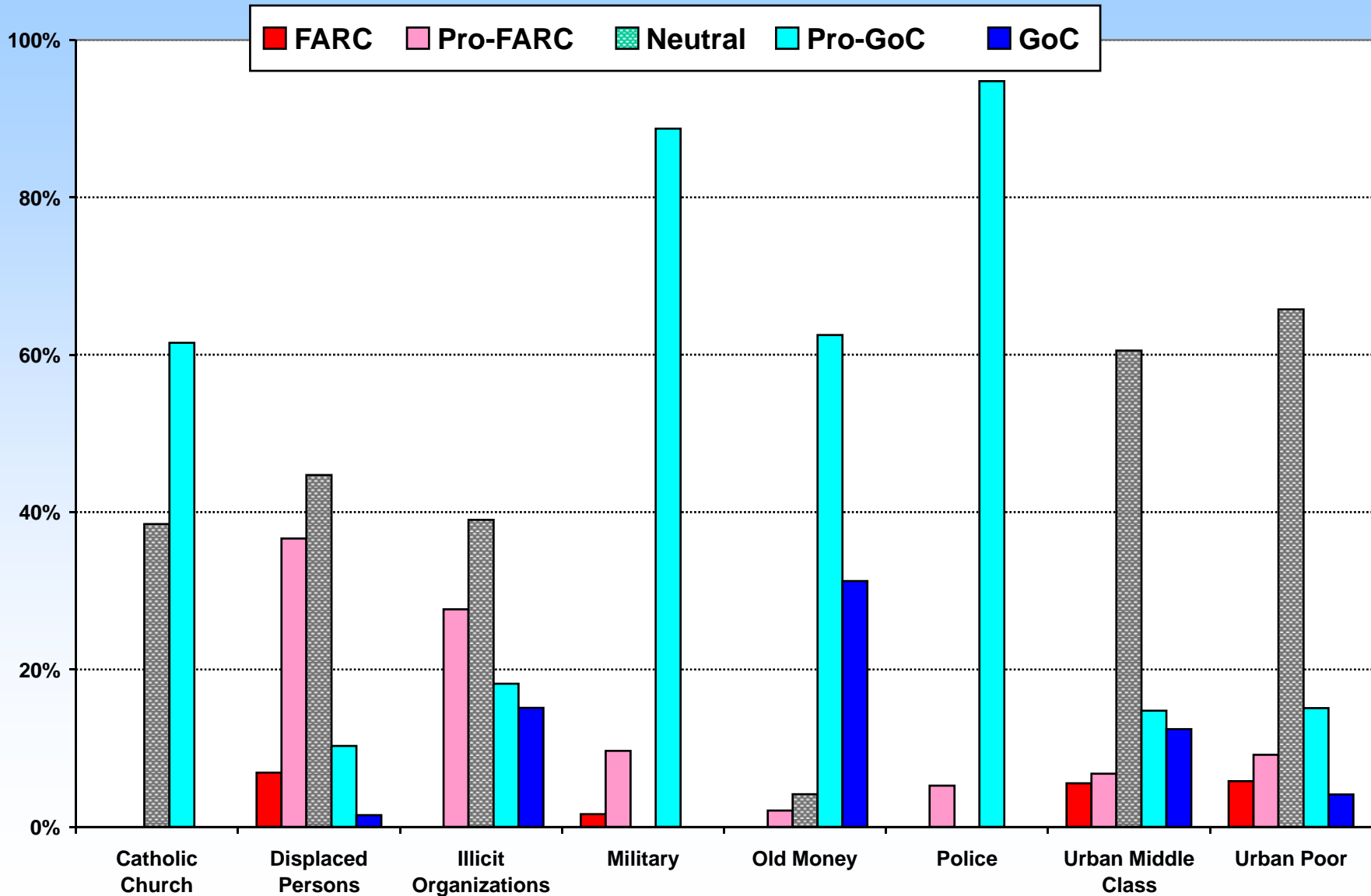


Example: Urban Poor

	FARC	Pro-FARC	Neutral	Pro-GoC	GoC
FARC	99.4%	0.3%	0.2%	0.0%	0.0%
Pro-FARC	0.1%	98.0%	1.3%	0.5%	0.0%
Neutral	0.0%	0.4%	99.1%	0.5%	0.0%
Pro-GoC	0.0%	0.0%	1.2%	98.5%	0.3%
GoC	0.0%	0.0%	0.1%	0.1%	99.8%



Initial Orientation





Data Elicitation

- **Charles Osgood's Semantic Differential**

- Osgood's method is a development of the Likert Scale in that Osgood adds in three major factors or dimensions of judgment:

- EVALUATIVE (good - bad)
- POTENCY (strong - weak)
- ACTIVITY (active - passive)

} Rolled up to a single parameter
= $E * \text{sqrt}(P^2 + A^2)$

- Semantic Differential is widely used in advertising and marketing research, including questionnaires, interviews and focus groups. The versatility of uses with bipolar adjectives and the simplicity of understanding them have made it ideal for consumer questionnaires and interviews.
- There are several large scale surveys done, providing data on EPA values for over 1000 different actions, emotions and people, led by David Heise, Department of Sociology, Indiana University

Translates SME words to a quantitative measure



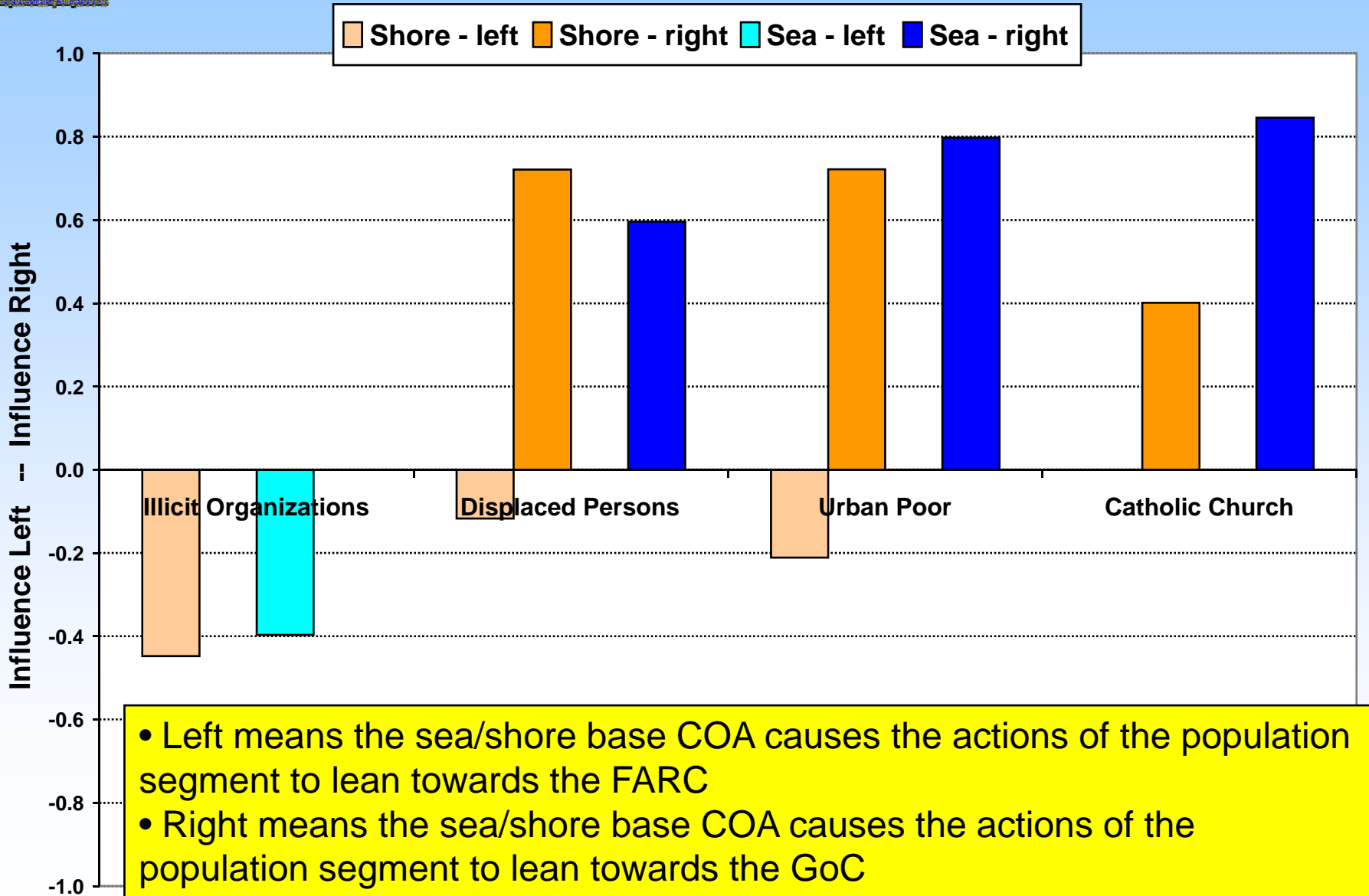
Impact of COAs Elicitation

- **“What words would this population segment use to describe MAGTF ‘sea-based’ operations?”**
 - ‘Positive words’ averaged to measure leaning more towards GoC (right)
 - ‘Negative words’ averaged to measure leaning more towards FARC (left)
- **“What words would this population segment use to describe MAGTF ‘shore-based’ operations?”**

Word	Impact
agree with	1.05
authorize	1.21
believe	1.62
please	2.93
appreciate	3.24



Impact of Shore/Sea Base





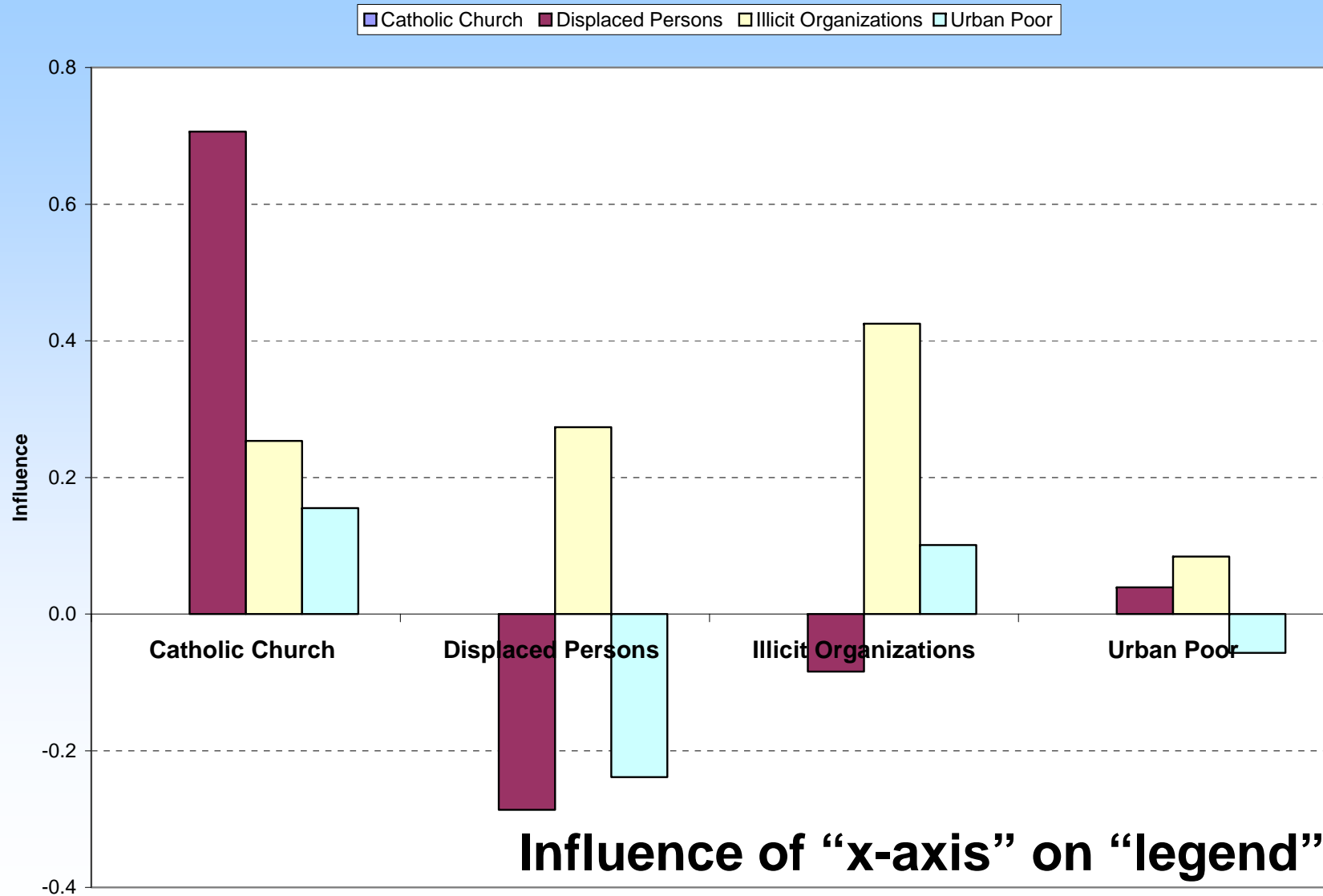
Influence Elicitation

- **Influence of other population segments**
 - “What words would this population segment use to describe another population segment?”

Word	Influence
unsuccessful	-2.41
impotent	-1.53
cowardly	-2.50
inexperienced	-2.25
mediocre	-1.47
average	-0.14



Influence of other Segments





Pythagoras Results



Questions?





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Ibn Khaldun

- **Ibn Khaldun (1332–1406)**
 - Considered the forerunner of several social scientific disciplines: demography, cultural history, historiography, the philosophy of history, sociology, and modern economics

<http://en.wikipedia.org/wiki/Khaldun>

