Modeling Trans-scale
Social Processes

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Topics

- Limits of Empiricism
- Radial Concepts
- Generic Model of Social Action
- Theory Templates
  - Trans-scale Social Coprocess (TSC)
    - Orientation Fields
    - Multigame Interaction
    - Social Structuration
    - Discourse Dynamics
- Conjunctural Theories (Cases)
- Trans-scale Social Analysis

Empiricism and Its Limits

- Virtue & vice of empirical analysis
  - Past patterns cannot predict the future by themselves
- Vital need for social theory
  - To identify generative patterns and structures within social complexities

- To identify patterns for which there is no data:
  - Dense interaction patterns
  - Private communication & covert actions
  - Intent, its generation & evolution
- Not observable but 'be-able' (Bell)

- Computational contribution
  - Move toward finer-grain, more dynamic models
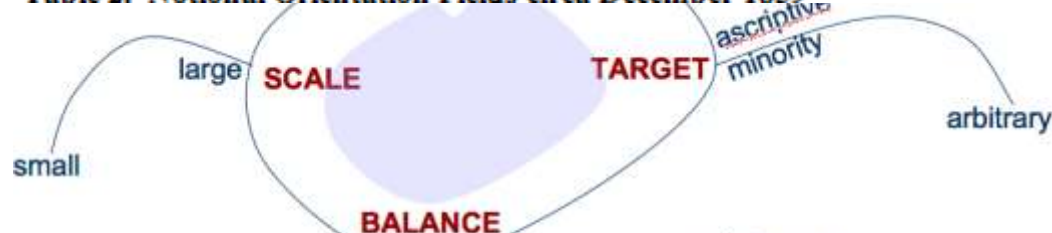
The Need for Social-Theoretical Models

- The limits of empiricism
  - Recognized since Hume
  - Advances in natural sciences have depended on theoretical progress
- Theory substitutes (placeholders) are currently popular
  - Common sense, *ad hoc* rules, folk theories, extrapolations of empirical generalizations
    - A pattern from a particular empirical space is projected into a vast and significantly different setting, yet still expected to be applicable
- Without theory, insights are *ad hoc* and, thus, not repeatable
  - No accumulation of insight or generalization results
- Critical insights developed by social theorists need to be taken into account by modelers

Interpretive Agent (IA) Mechanisms

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- Prototype semantics
  - Semantic data model
  - Miller ranges
  - dimensional chunking
- Orientation fields
  - Emotion, cognition
    - Mutually redefining
- Culture, discourse, identity
  - Orders of indexicality
  - Thin coherence
- Multigames (structuring action)
  - Available? Which game? Which (joint?) strategy?
- Situated Abstraction
  - Hi-Dim problem solving

	Brown	Abolitionism	Union	Lincoln	US Flag	Slavery	Disunion	War
Brown	0.85	0.7	0.6	0.2	-0.4	0.98	-0.4	0.85
Douglass	0.7	0.8	0.5	0.3	0.2	-0.8	-0.2	0.5
Garrison	0.6	0.8	-0.5	0.2	-0.3	-0.8	0.3	-0.5
Lincoln	-0.2	0.4	0.8	0.6	0.8	-0.6	-0.8	-0.4
Douglas	-0.7	-0.6	0.4	-0.2	0.5	-0.2	-0.5	-0.7
Yancey	-0.95	0.95	-0.9	-0.85	-0.5	0.85	0.9	0.7

Table 2. Notional Orientation Fields circa December 1859

	Donative	Economic	Coercive
Donative	Reciprocity of recognition	Recognition as a means to acquire economic resources	Recognition as a means to acquire coercive resources
Economic	Economic means of acquiring recognitive resources	Reciprocity of goods, services	Economics as a means of acquiring coercive resources
Coercive	Coercion as a means of acquiring recognitive resources	Coercion means to acquire economic resources	Reciprocity of force & threat

Concepts with Radial Structure

- Prototype concepts are an empirical discovery of cognitive science

  - Similar to Wittgenstein's 'family resemblances'

- Once recognized, they can be theorized, but their form was identified by experiment

- Prototype structures are multidimensional and radial, with an (idealized) exemplar at the core and more idiosyncratic representatives along the radians

- They define a basic form that bounded rationality takes

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Prototype Examples

robin

road runner

albatross

645

11

odd

3

23

207

535

5,203,519

Love

ennui

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Genocide as a Radial Concept

organization

state

explicit

PERP

inferred

movement

INTENT

ascriptive

large **SCALE**

TARGET

minority

small

BALANCE

resistance

one-sided,
defenseless

arbitrary

Semantic data models

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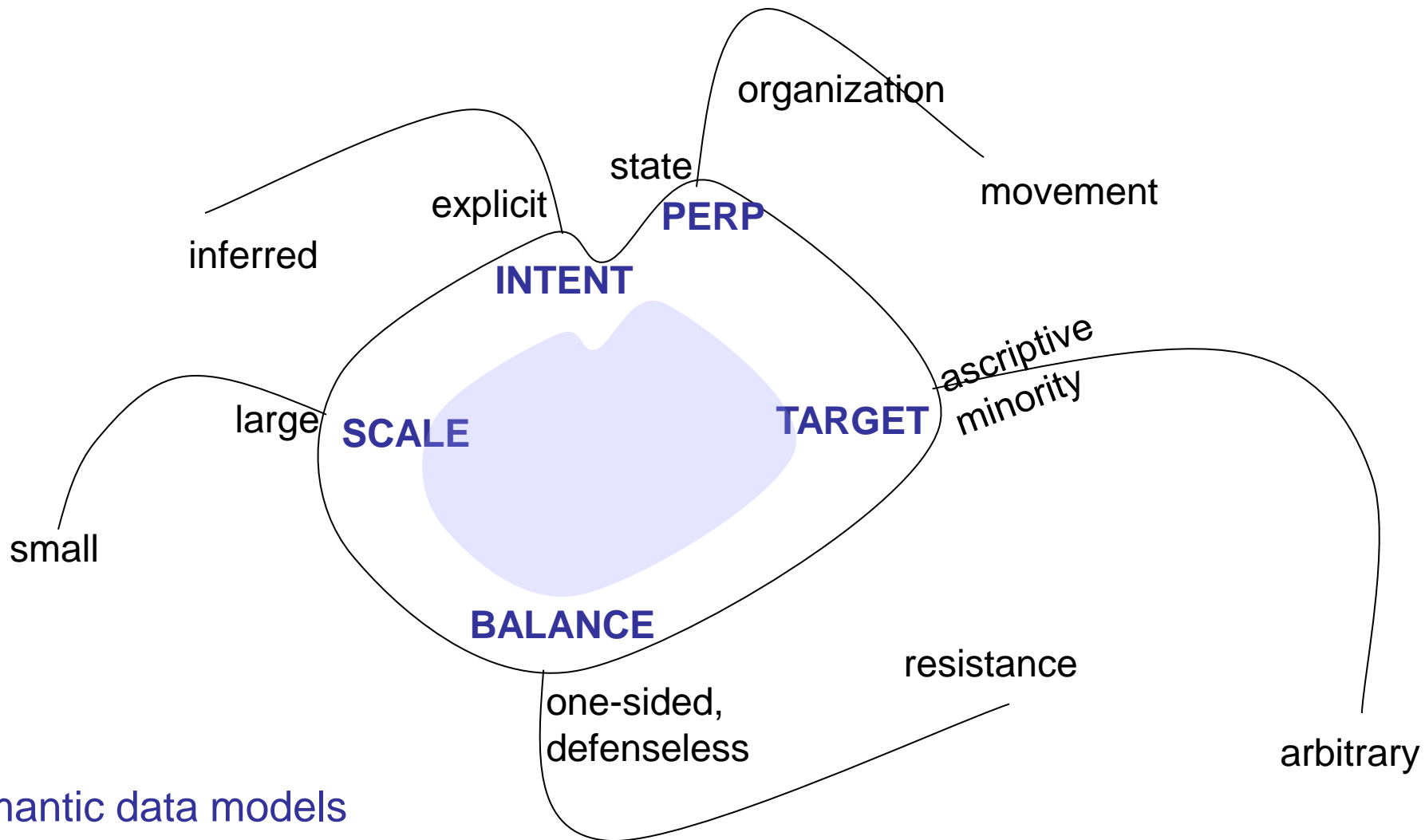
Bounded Rationality and Complexity

- Radial structures provide a way of organizing and controlling the complexity of empirical representations
  - Allowing bounded rationality to manifest more conceptual power & flexibility than might otherwise be possible.
  - Prototype concepts group similar phenomena together,
    - with the most pervasive (or the most salient) being central in the reasoning process
    - with divergences being laid out on a periphery defined along axes and/or regions of ever greater difference

- Radial concepts are used throughout the Trans-scale Social Co-process template
  - The resulting structure is far more flexible and powerful than, for example, simple sets of objects, as formalized in set theory
    - Typically presumes unambiguous definitions of objects, and discrete specification of set boundaries

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Scale	Description
Generic Typologies	Actor types, propensity types (influence, interest, utility, constraints, affordances), identities, protoroles, protorules
Trans-scale Social Coprocess (TSC)	multigame interactions; social structuration; orientation fields, identities & discourse dynamics
Social Conjunctures	The type of historical setting/process, e.g., decline of empire coupled with the emergence of local rebellions, the rise of extremist/totalitarian movements, predatory intervention in resource rich provinces, etc.
Historical Configuration	The instantiation of a particular social conjuncture by the identification of the specific structures, institutions, movements, factions, events, etc.
Empirical Dynamics	The mining of communications and actions (extended by the use of thesauri), to broaden the scope of empirically-oriented scenarios & discourse analysis

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A Quasi-Syllogism of Pragmatic Action

- Chinese ethical thinking . . . follows an implicitly logical form approximating to [a] syllogism, applicable directly to concrete situations.
  - In awareness from all viewpoints, spatial, temporal, [social], and personal, of everything relevant to the issue, I find myself moved toward X; overlooking something relevant I find myself moved toward Y.
- *In which direction shall I let myself be moved?*
  - Be aware of everything relevant to the issue.
  - Therefore, let yourself be moved towards X. (Graham 1989)
- Note, in particular, the multi-dimensional nature ("from all viewpoints") of reasoning within this quasi-syllogism.
  - Allows, for each viewpoint, a region of sufficiency to be identified
  - Supports high-dimensional and approximate action selection
  - Mechanism may provide a pragmatic approach to a problem that can be modeled consistent with domain-specific requirements

A (Richer) Pragmatic Hermeneutic

- Problem
  - Experience to dissatisfaction
- Constraint
  - Barriers & obstacles
- Dependence
  - Relational needs
- Affect/Intent
  - What you seek/defend/resist

- Solution
  - Satisfaction to experience
- Affordance
  - Overcoming barriers
- Power
  - Relational control
- Action/Effect
  - Results, expected & actual

Endogenous, situated coherence shapes mechanism evolution

Situated Abstraction: Four Pragmatic Pairs
## (Prospective / Activated)
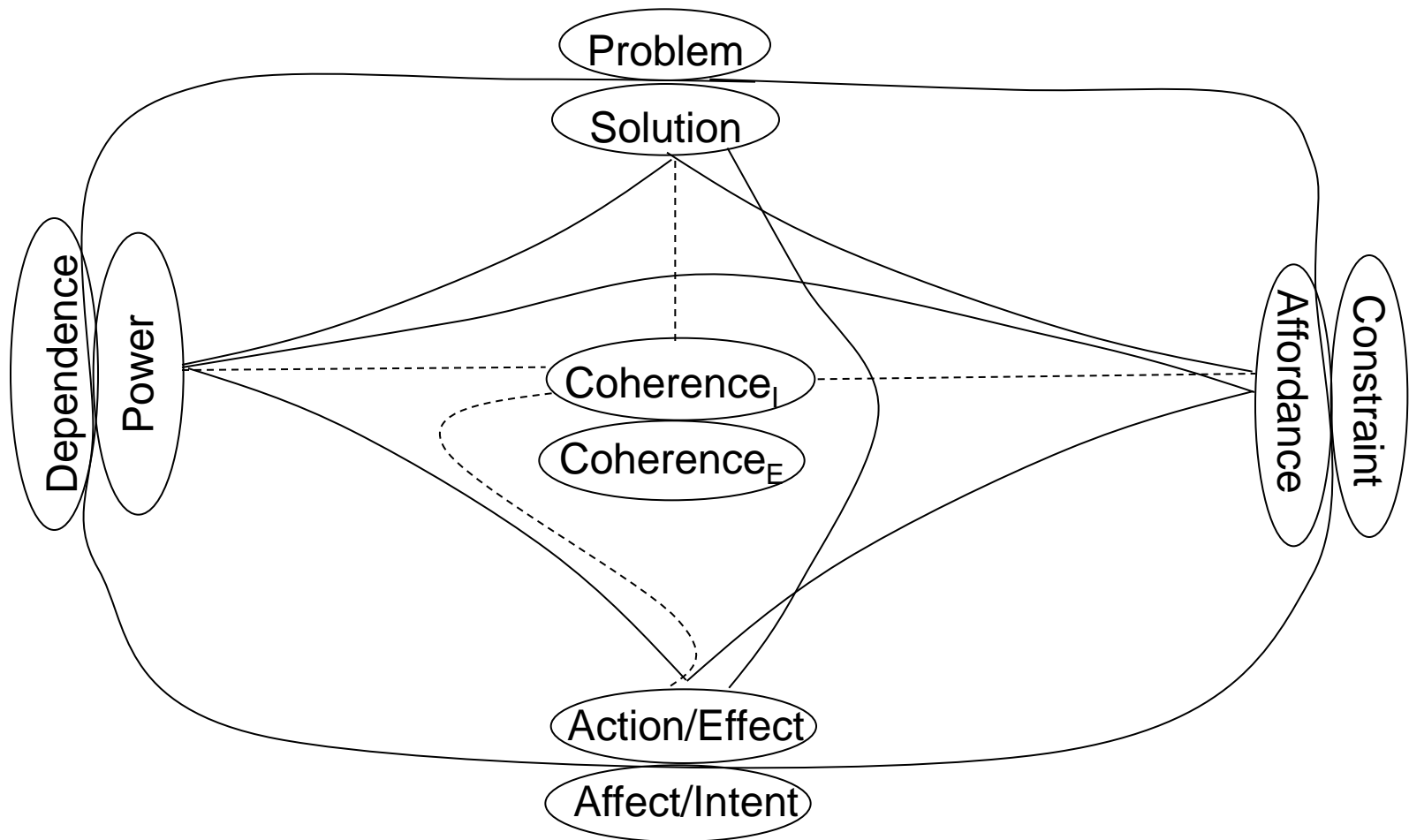
Theory Templates

- The nature of theory templates (Fararo, 2001)
  - Abstract forms of process mechanisms that are filled in with more specific forms for the given cases under study
  - A logical placeholder for the construction of innumerable theoretical models that satisfy the template

- Examples of theory templates
  - Four function (AGIL) paradigm (Parsons, 1957)
    - Adaptation, goal-attainment, integration, latency
  - General Social Equilibrium theory (Coleman, 1990)
    - Theory of markets, generalized
    - Actors & interests, resources and control
  - Game-Theoretic Unification (Gintis, 2009)
    - Four types of game theory provide the basis for social science unity
      - *Evolutionary GT (& complexity theory) define lower & upper bounds*
        - » Suggestive rather than definitive or predictive
      - *Classical, behavioral & epistemic game theories*
        - » Norms as a motivating & correlating device

TSC Template as a Synthetic Framework

- **Orientation fields:** affinity, bonding, identification, trust, respect, status, reputation, solidarity, patriotism, legitimacy, authority, corruption
  - Recognition as a scale phenomenon: affinity, solidarity, universality
- **Multigame interactions:** reciprocities of solidarity, exchange and conflict, building resources for economic or military domination, the generation of social structures
- **Social structuration:** role theory, division of labor, class conflict, religious conflict, religious sectarianism, ethnic conflict, acculturation, circulation of elites, status inconsistency
- **Discourse dynamics:** mass belief systems, the rise of religious &/or ideological movements, sectarian fracturing, historical transformations (Renaissance, Reformation, Enlightenment), axial ages
- Each process is simultaneously active
  - Social co-processes are trans-scale and mutually shaping

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Trans-scale Social Coprocess

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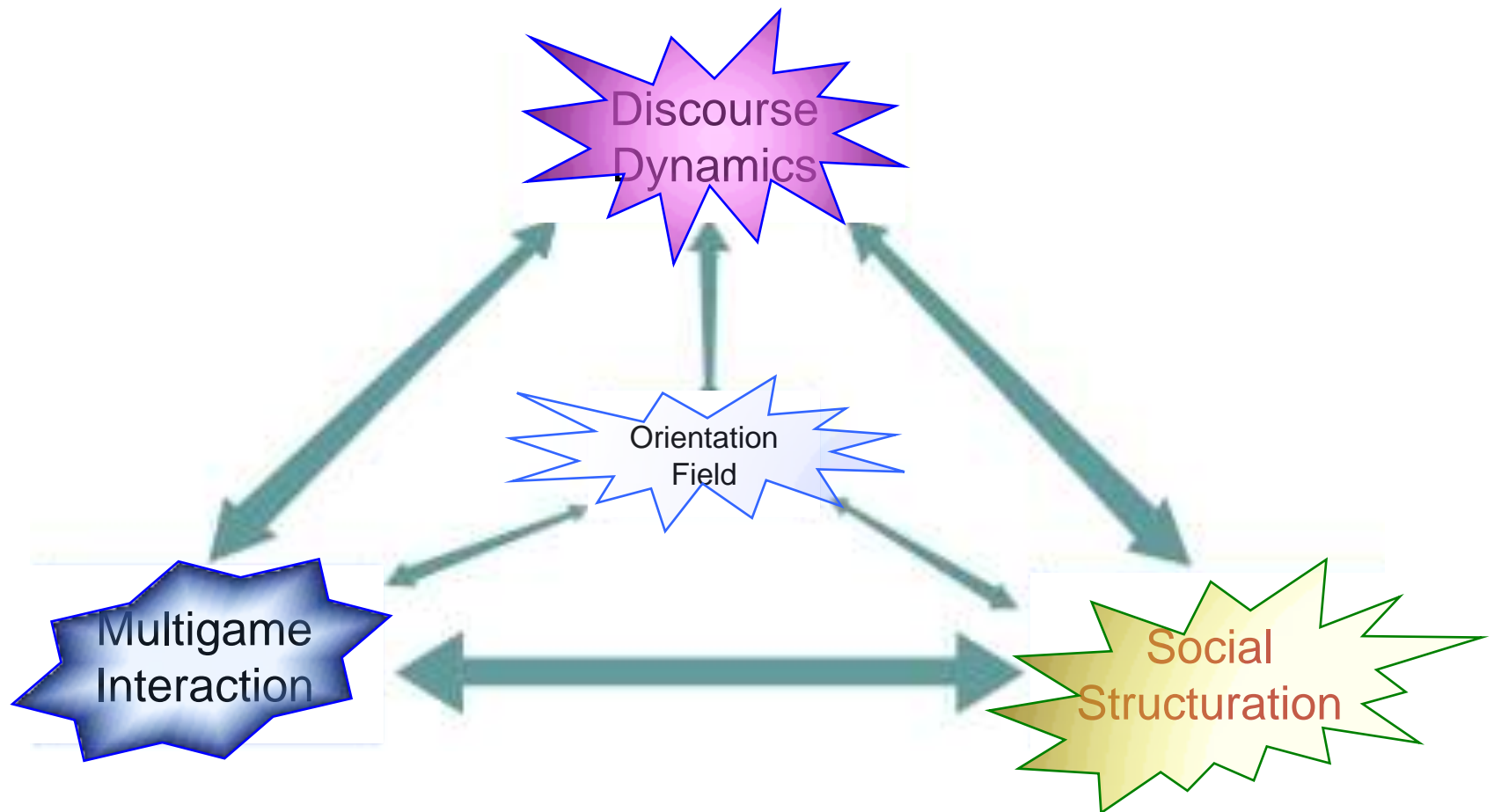
The Fecundity of 'Games'

- John von Neumann, 1944
  - *Theory of Games and Economic Behavior*
- Norton E. Long, 1956
  - The local community as an ecology of games
- Ludwig Wittgenstein, 1958
  - *Philosophical investigations*
- Harold Garfinkel, 1963
  - A concept of, and experiments with, "trust" as a condition of stable concerted actions
- James P. Carse, 1986
  - *Finite and Infinite Games*
- Agent models have the potential to draw upon and realize qualitative game insights

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Family Resemblances among Games

- Consider the proceedings that we call 'games' … board-games, card-games, ball-games, Olympic-games, and so on

- *What is common to them all?*
  - *You will not see something that is common to all, but similarities, relationships, and a whole series of them at that.*
    - Don't think, but look! Are they all amusing? Or is there always winning and losing, or competition among players? Look at the parts played by skill and luck … We can go through many, many groups of games … see how similarities crop up and disappear?
  - *We see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail*
  - *I can think of no better expression to characterize these similarities than 'family resemblances'*

- "I shall say that 'games' form a family"

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Finite and Infinite [Open-Ended] Games

- A finite game is played for the purpose of winning

- Power is a concept that belongs only in finite play
- The exercise of power always presupposes resistance
- Power is not evident until two or more are in opposition

- Defeat is death in finite play; the finite player dies under the terminal move of another

- An open-ended game is played for the purpose of continuing play

- Infinite play is always dramatic; its outcome is endlessly open
- Infinite players do not *oppose* the actions of others, but *initiate* actions in a way that others will respond by initiating *theirs*

- The joyfulness of infinite play, its laughter, lies in learning to start something we cannot finish

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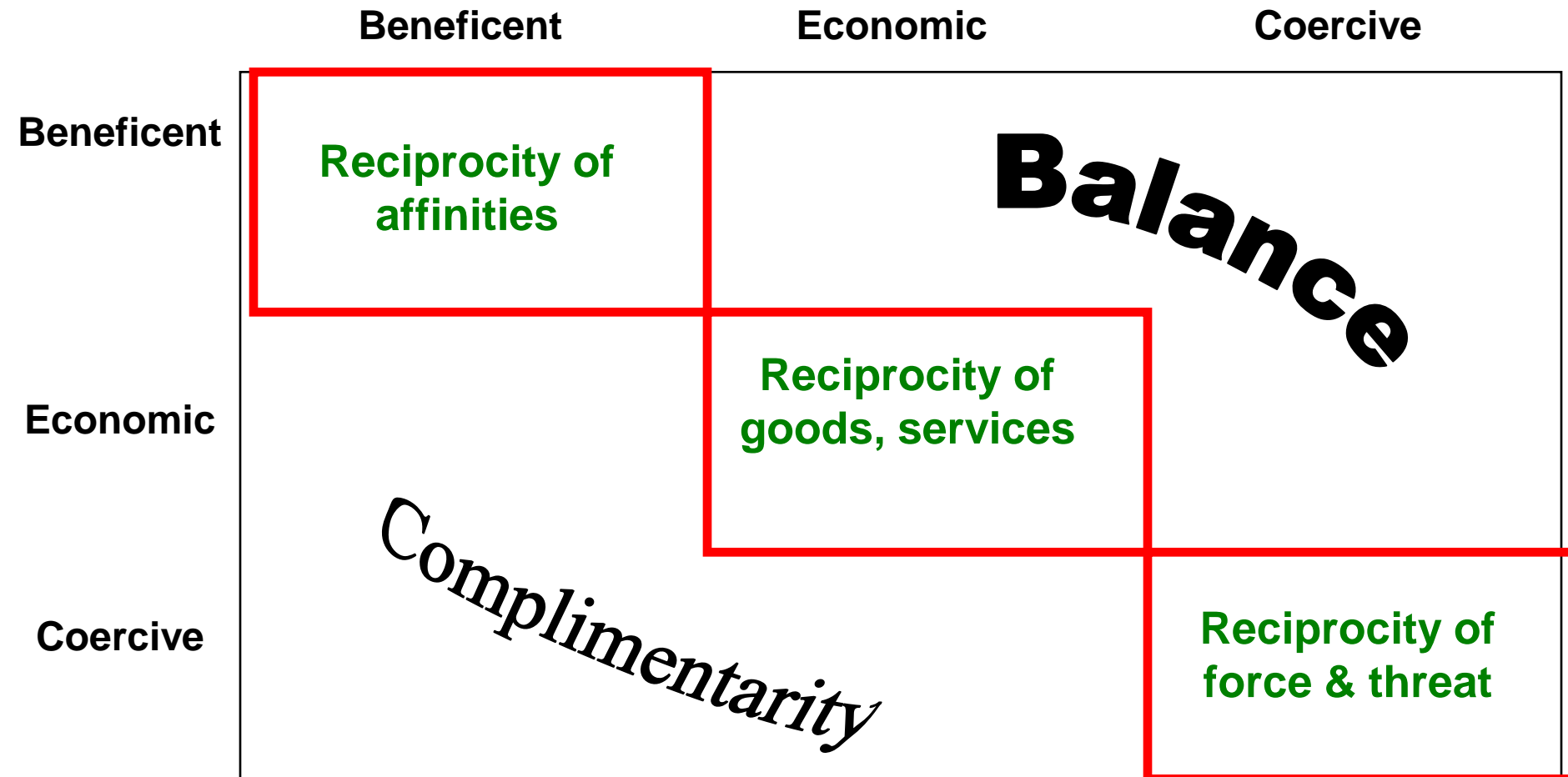
Social Multigames

- Actors play multiple games simultaneously
  - Communications and actions are often simultaneous moves in multiple games
- There are three types of radial multigames: altruistic, economic and coercive
  - Multigames can be embedded one within another
  - Broad games can be deeply constructed
- Interactive games can be associated with actor roles
- Actors may enter into a joint game, yet with each defining it differently
- Institutions, roles and strategies are defined in terms of interlocking multigames
- Multigames may interlock across multiple scales and, thus, structures

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An Ecology of Multigames

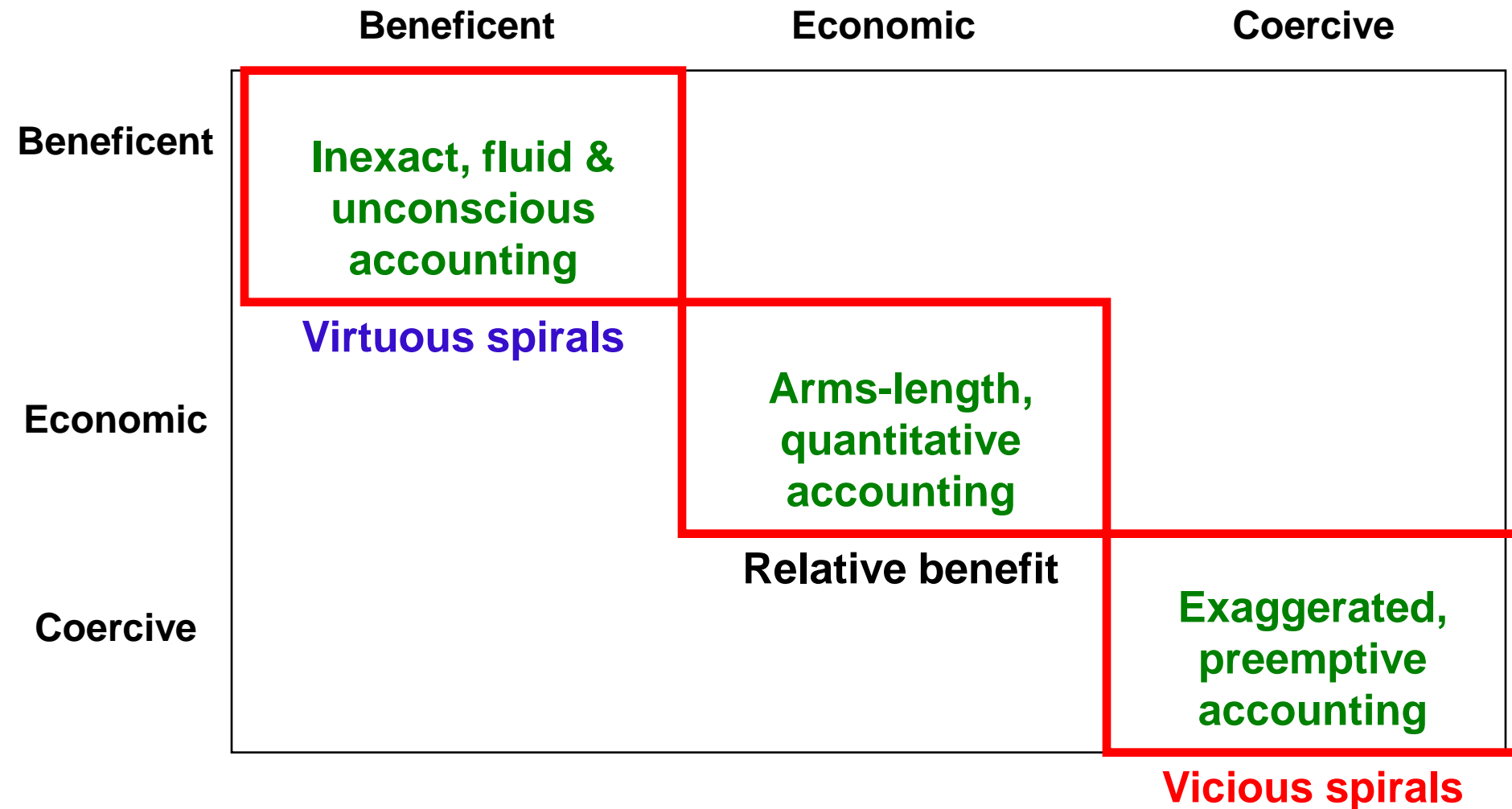|	Beneficent	Exchange	Coercive
Beneficent	**Reciprocity of beneficence**	**Beneficent means of acquiring economic resources**	**Beneficent means of acquiring coercive resources**
Exchange	**Economic means to acquire beneficent resources**	**Reciprocity of goods, services**	**Economic means of acquiring coercive resources**
Coercive	**Coercive means of acquiring beneficent resources**	**Coercive means of acquiring economic resources**	**Reciprocity of force & threat**

An Ecology of Multigames
Reciprocity Diagonal

	Beneficent	Economic	Coercive
Beneficent	**Reciprocity of affinities**		
Economic		**Reciprocity of goods, services**	
Coercive			**Reciprocity of force & threat**

Balance

Complimentarity

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An Ecology of Multigames
Reciprocity Accounting & Effects

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An Ecology of Multigames
Off-Diagonal Exchanges

	Beneficent	**Economic**	**Coercive**
Beneficent		**Beneficent means of acquiring economic resources**	**Beneficent means of acquiring coercive resources**
Economic	**Economic means of acquiring beneficent resources**		**Economic means of acquiring coercive resources**
Coercive	**Coercive means of acquiring beneficent resources**	**Coercive means of acquiring economic resources**	

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Multigame Characteristics

- Prototype games--altruistic, coercive, economic
- Multiple--players play multiple games simultaneously
- Reciprocal--in cooperation or conflict, stable processes arise from reciprocity
- Positional--results are relative, and never final
- Continuous--multigame moves are calibrated
- Open--games can be initiated or entered by new players
- Implicit, emergent--multigames can emerge in fragments and evolve into fuller form
- Historical--multigame characteristics allow historical games to be identified and mapped

  - Structurable—Configurations of multigames, including dominant and contributory games, are building blocks of structure

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Dimensions of Social Structure

- **BioFunctional Differentiation**
  - Division of labor
  - Institutions
    - family
    - economy
    - state
    - religion
  - Roles
    - age
    - gender
    - organizational
    - capability specialization
  - Evolves thru **action**
    - Divergent, convergent

- **Resource Hierarchies**
  - Class, status, party
    - deference practices
    - cattle
    - land
    - slaves
    - harems, concubines
    - political office, position & influence
    - precious metals
    - symbolic shares of business ownership
    - electronic currencies
  - List is not exhaustive
  - Substrate for action
    - Accumulating activities

- **GeoCultural Networks**
  - Civilization
  - Nation
  - Race & ethnicity
  - Language
  - Religion, philosophies & ideologies
  - Cultural traditions, rituals & practices
  - Spreads geographically
    - genetic inheritance
    - contagion
    - diffusion
    - imitation
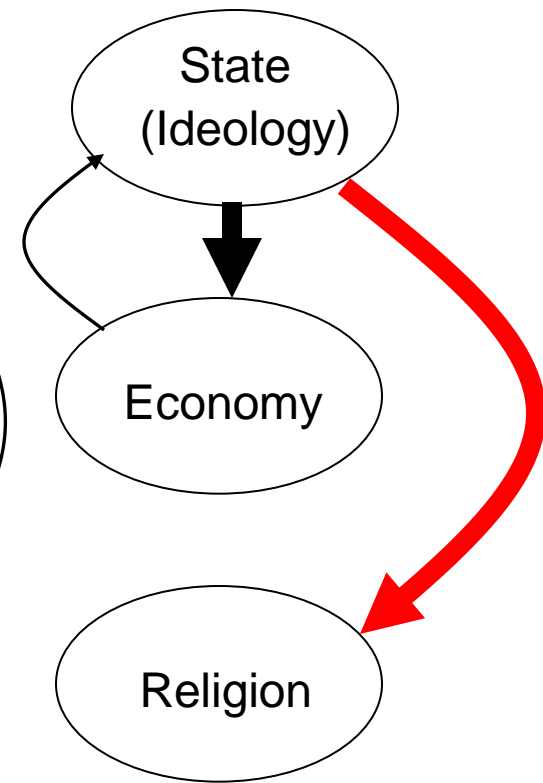   - learning
    - conversion
    - migration
    - conquest

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Modern Institutional Structures
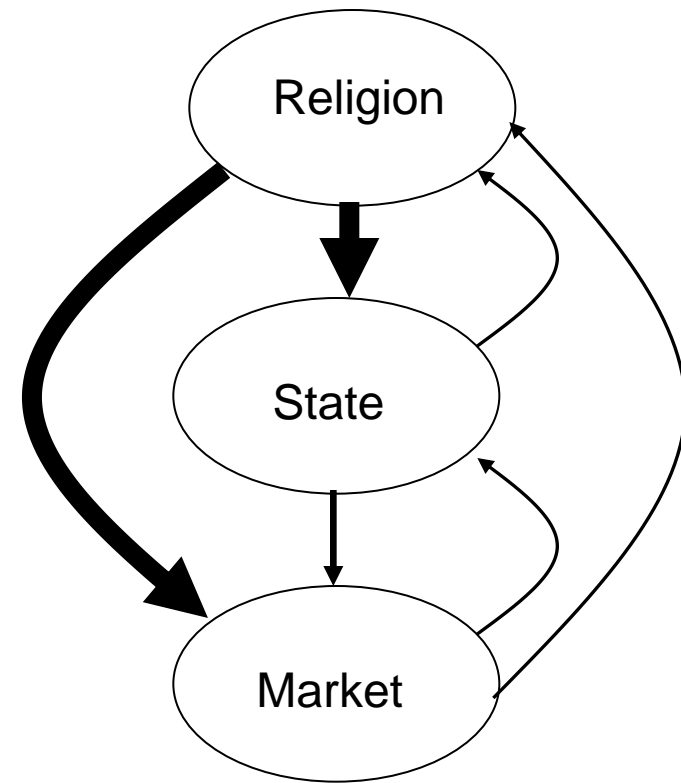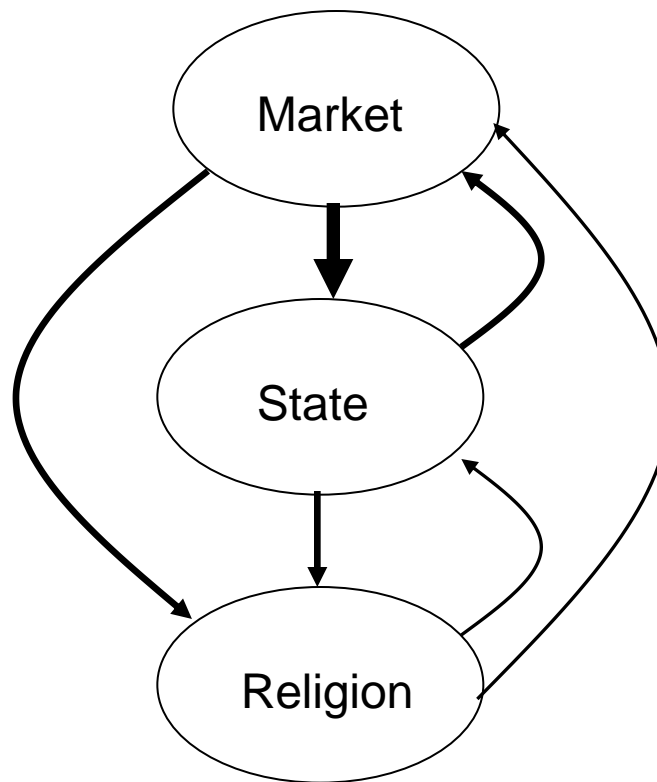
Theocracy   **Modernity**   **Communism**

Cognitive & Emotional Fields

- Social agents maintain cognitive and emotional fields
  - of the natural, socio-cultural and technical ecologies in which they are immersed,
  - within which, entities, situations, types and relationships are:
    - 1) identified (and sometimes defined), and
    - 2) associated with an emotional valence
  - Both types of fields are grounded in biological capabilities

- Fields fluctuate
  - A dynamic interaction of the two fields defines a composite field of orientation within which agent intentionality is framed
    - Can be settled or highly situated in form,
  - Such intentionality is multi-focal, and
 - Attention and salience fluctuates among focal points, ranges and relative to scenarios

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Orientation Fields

- Orientation is a dual structure that combines cognitive referents with affective components
  - Cognitive components are conceptual prototypes that manifest a radial structure & reference area reasoning
    - Geometric models
  - Emotional components are constituted by continuous valences directed at a particular prototype concept
    - e.g., values ranging from +1.0 to -1.0
    - Some (many) valences may be derived

  - Orientation structures are relatively simple, allowing more complex issues to be framed in terms of two interrelated questions:
    - which (aspects of) elements are the focus of the actor's emotional attraction or repulsion?
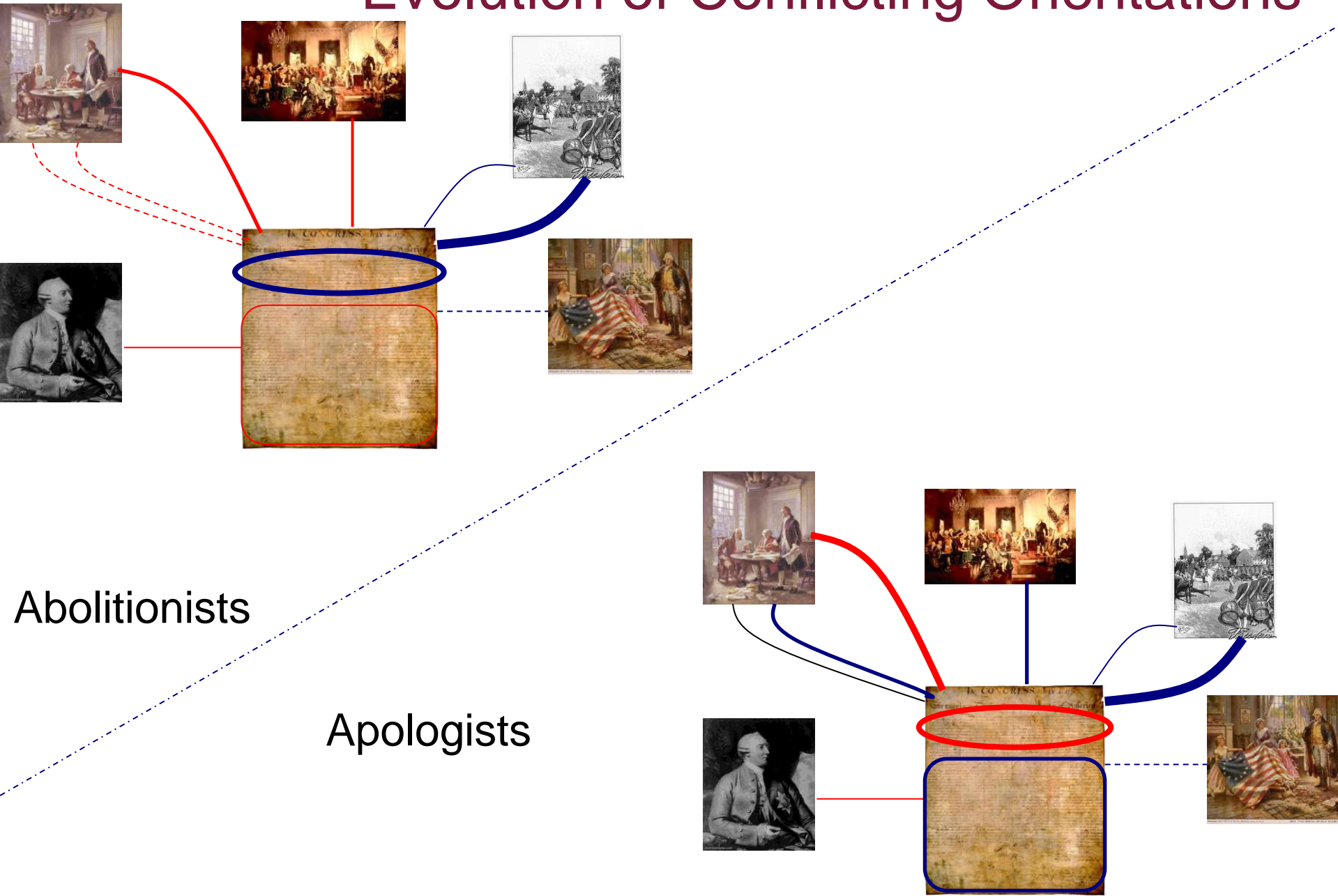   - how do emotional valences change in response to exogenous and endogenous events?

An Historical Example

- U.S. Declaration of Independence examined regarding:
  - The orientation field represented within its text
  - Its location within the orientation fields of contemporary and subsequent historical actors
- Declaration serves as an historical focus illustrating how social fields manifest within and influence history
  - The Declaration expresses negative affect toward the King of England, his legislature and foreign mercenaries
  - It holds positive affect for the "good people of the colonies," and the "Lives, Fortunes and Sacred Honor" of their representatives
  - Overall, animated by antagonism toward oppressive authority
- Orientation fields carried by texts and objects as well

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Declaration has (and shapes) Orientation Fields

People

Events

Concepts

Symbols
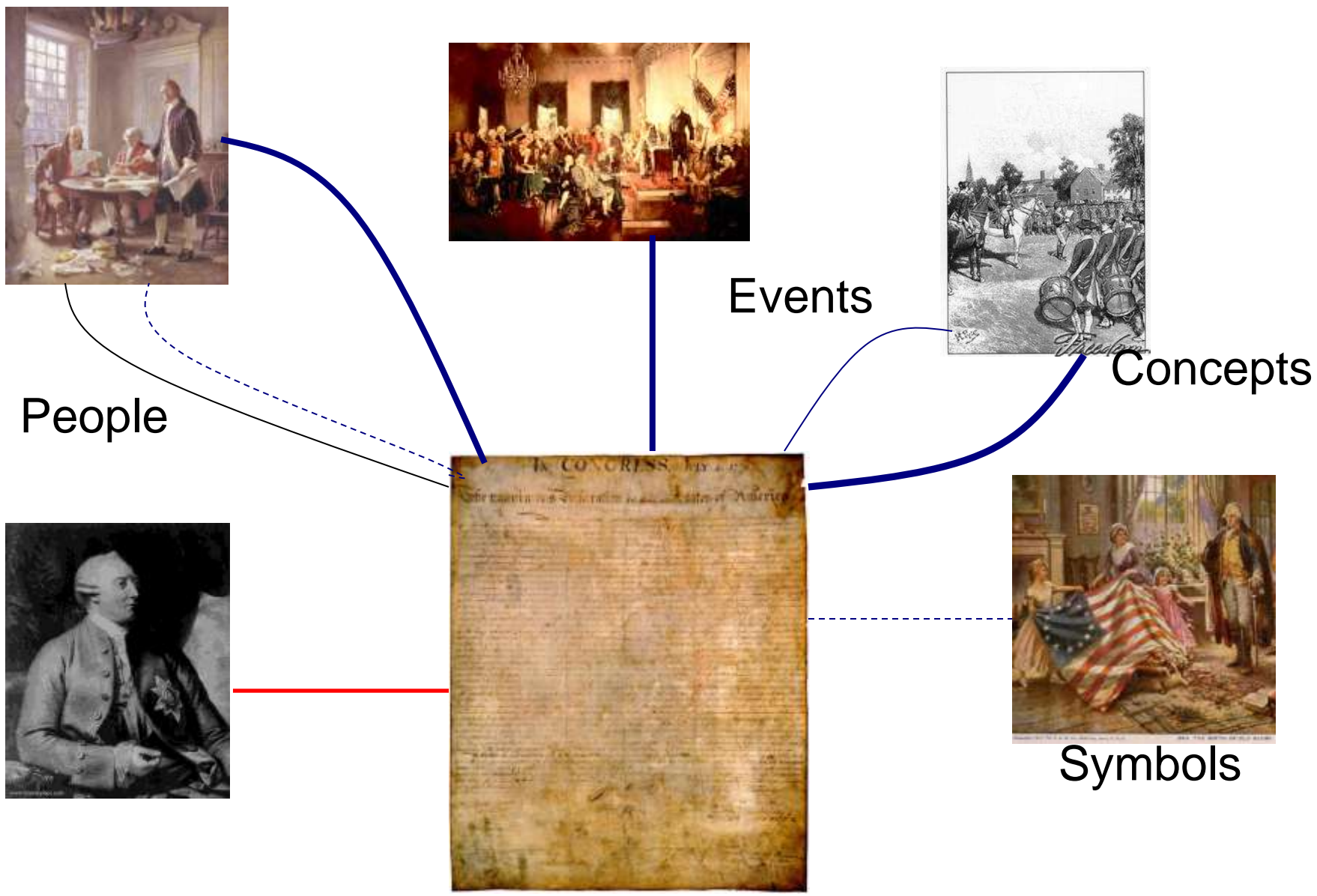
Evolution of Conflicting Orientations

Abolitionists

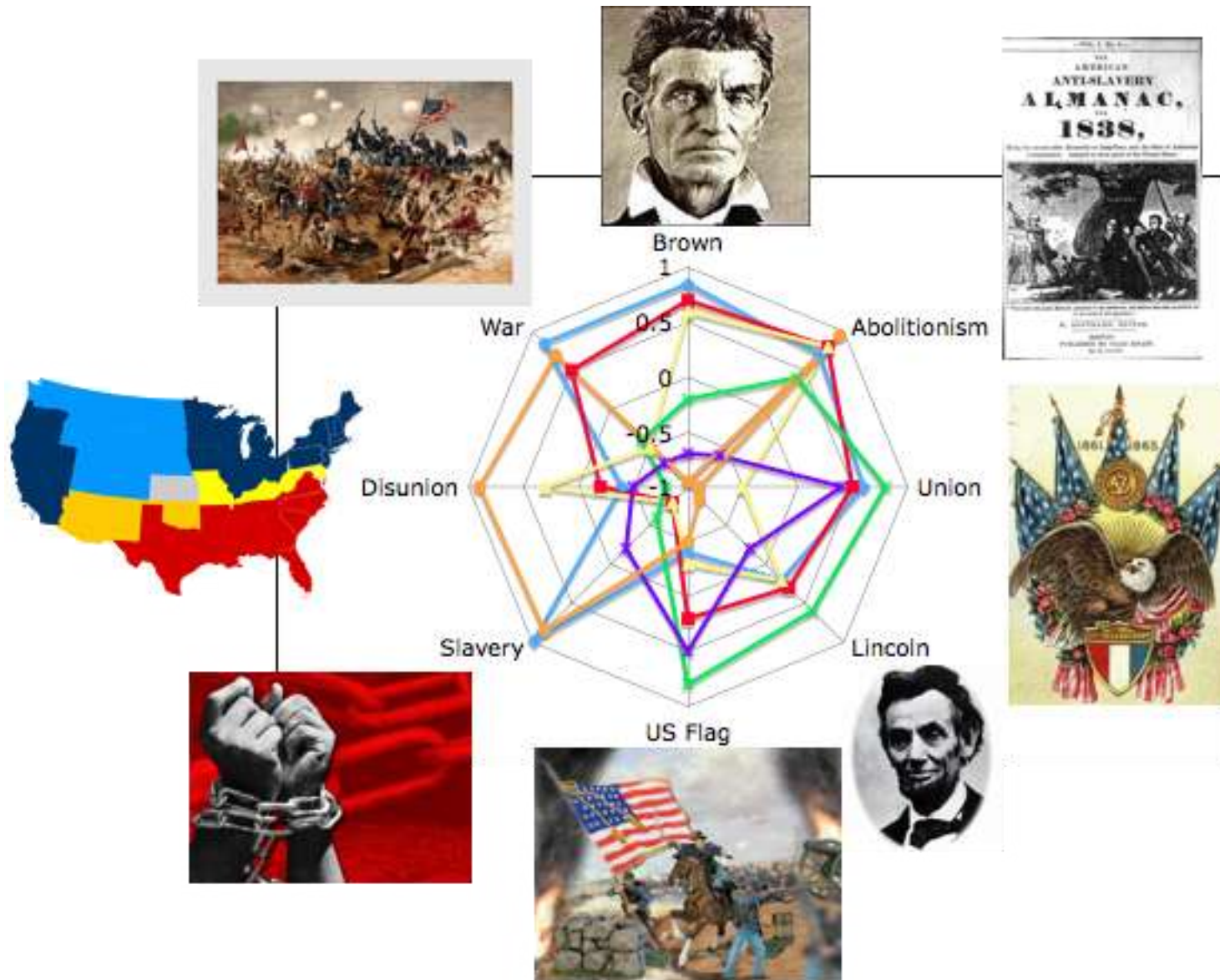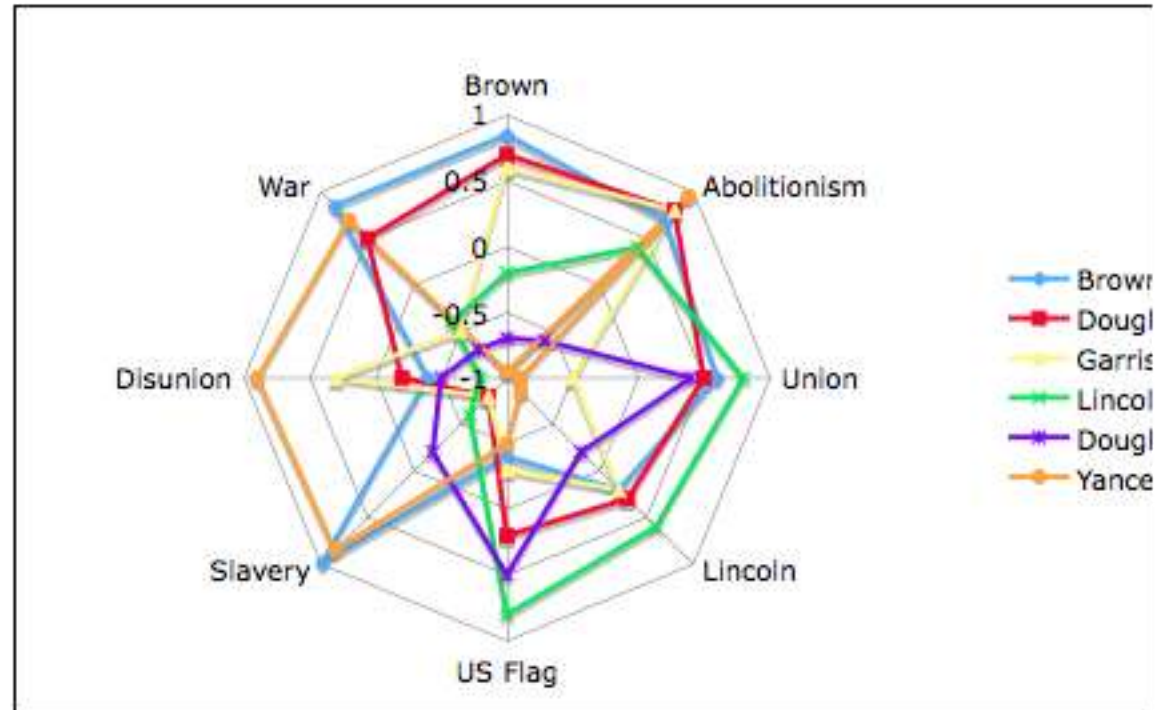Apologists

Collective Orientation

- Orientations are characteristic of collectivities as well as individuals
  - Orientations are continuously shaped through interaction
  - In all social groups and institutions, it matters what the common orientation is
    - It defines beliefs, meanings, values, intentions, motives, expectations, hopes and fears, scenarios and narratives

- Social orientations are dynamic, and never precisely shared
  - Even among individuals with very similar perspectives, what is focal to one, is derived for another
  - Expressed commonalities are often calibrated relative to self-image and 'other orientation'
  - Social orientations are partially indexical and somewhat fluid

Polarized Orientation Field

Multidimensional
representation

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Orientation Fields

	Brown	Abolitionism	Union	Lincoln	US Flag	Slavery	Disunion	War
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Yancey	-0.95	0.95	-0.9	-0.85	-0.5	0.85	0.9	0.7

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Orientation Accounting: Social Effects

- Significant other(s)
  - mother, father, spouse, etc.
- Family reunion
  - deferring to the climate of opinion
- Peer pressure
  - implicit and explicit constraints
- In/out groups
  - diverse types and forms
- Anticipatory socialization
  - From the priesthood to the mob
- Reference groups & the social self
  - exemplary representatives
  - toward the remote, historical, fictional
- All are sociological classifications. In interaction, orientation accounting is given various labels but is largely unconsciously practiced

Ruth Wodak

Narrative Foundation of Collective Coherence

- Nations as an example of social structuration

1. **Nations (and various social identities) are mental constructs (Anderson)**

2. **National (and various social) identities are produced and reproduced (as well as transformed and dismantled) discursively**

3. **National identities imply similar concepts & emotional dispositions**

4. Material and institutional conditions intertwine with discursive practices

5. In national discourse, cultural and political discourses are intertwined

6. National discourses emphasize uniqueness and uniformity and tend to ignore intra-national differences

7. Diverse identities are discursively constructed according to audience, setting, topic and content and, therefore, malleable, fragile and diffuse

Generation of Discourse Communities

- Dynamic interplay of cultural resources and situated identities
  - Entrepreneurial roles
  - Creation, organization and shaping of public rituals
  - The emergence of ideal types
  - Coercive enforcement, economic reinforcement,
  - Organization, cross-articulation, evolution, reorganization
- Apter and Saich have proposed four historical movement mechanisms:
  - Retrieval involves the creation of a mythical past
  - Projection is the derivation of an identified future
  - Exegetical [ideational, ritualistic] bonding as a form of discipline
  - Symbolic capital [plus what else?] as a form of power
  - Such mechanisms can be generalized and focused
- Any nations &/or historical setting will contain dozens or hundreds of overlapping discourse communities

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The Fluidity of Coherence

- *Symbols are indexical*
  - All signs, gestures, words and terms acquire content, significance, truth and meaning from the context of their utterance and/or invocation. Emphasis, irony, innovation and drift cause what symbols denote, connote and imply to be limited in scope.

- *Logics are local*
  - All logics are dependent upon the clarity and stability of the terms they reference and, thus, the discourses from which these terms derive. Physical, biological, and social circumstances and settings contribute to their coherence and boundaries. All 'sets' are subject to ambiguities of definition.

- *Propensities are situated*
  - Natural propensities, structural dependencies and social intentions are shaped by circumstance and setting and are, accordingly, subject to transformation on various temporal scales.

- *Structures transform*
  - All structures are established and maintained through relationships. Relative to their constitutive interactions, structures are enduring, but also in flux, both in their forms of persistence and in their proximate effects.

- *Discourses evolve*
  - The dynamics of propensities, structures, and dependencies, as well as incentives, intentions and interactions cause discourses to transform and evolve. Cultures are large-scale, extensible, weakly coherent social discourses.

- *Paradox reframes*
  - In both mundane and rigorous discourse, contradictions and paradoxos gives rise to recategorization, innovative abduction, and emergence.