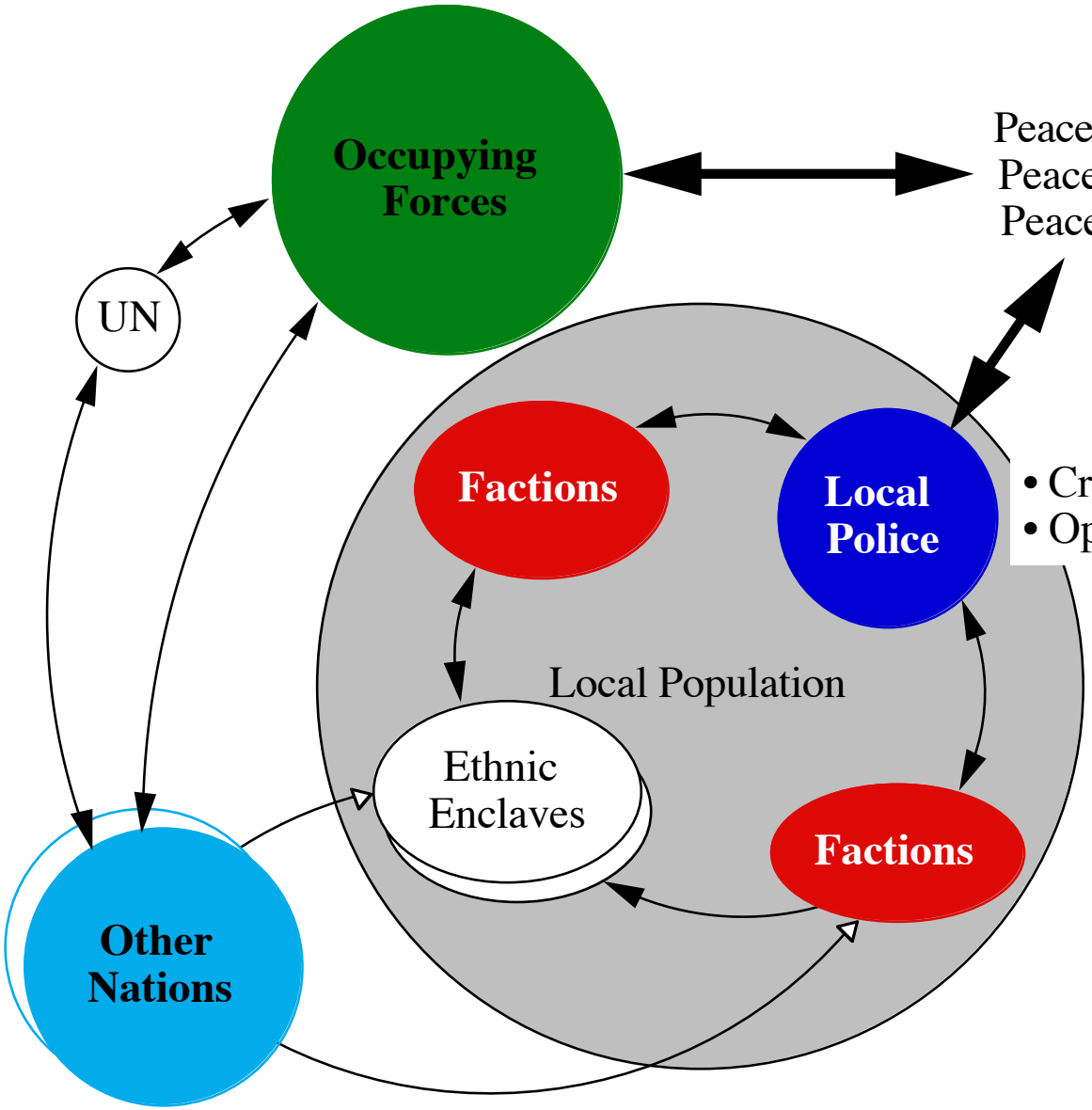
International Command and Control Research& Technology '98

Models for Effective Decisions in Emerging Conflict

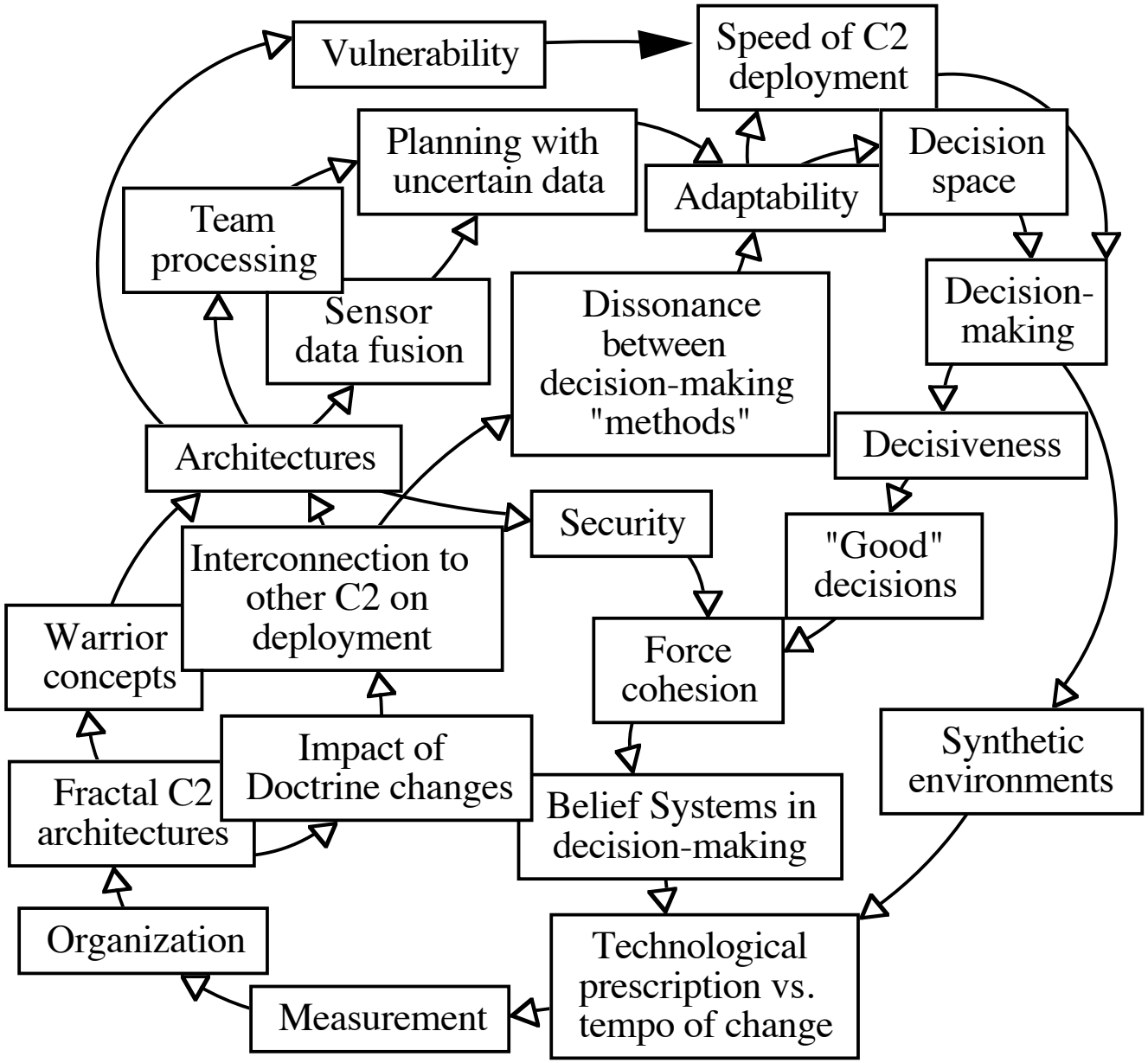
Professor Derek K Hitchins

Emerging Conflict Decision-making Environment



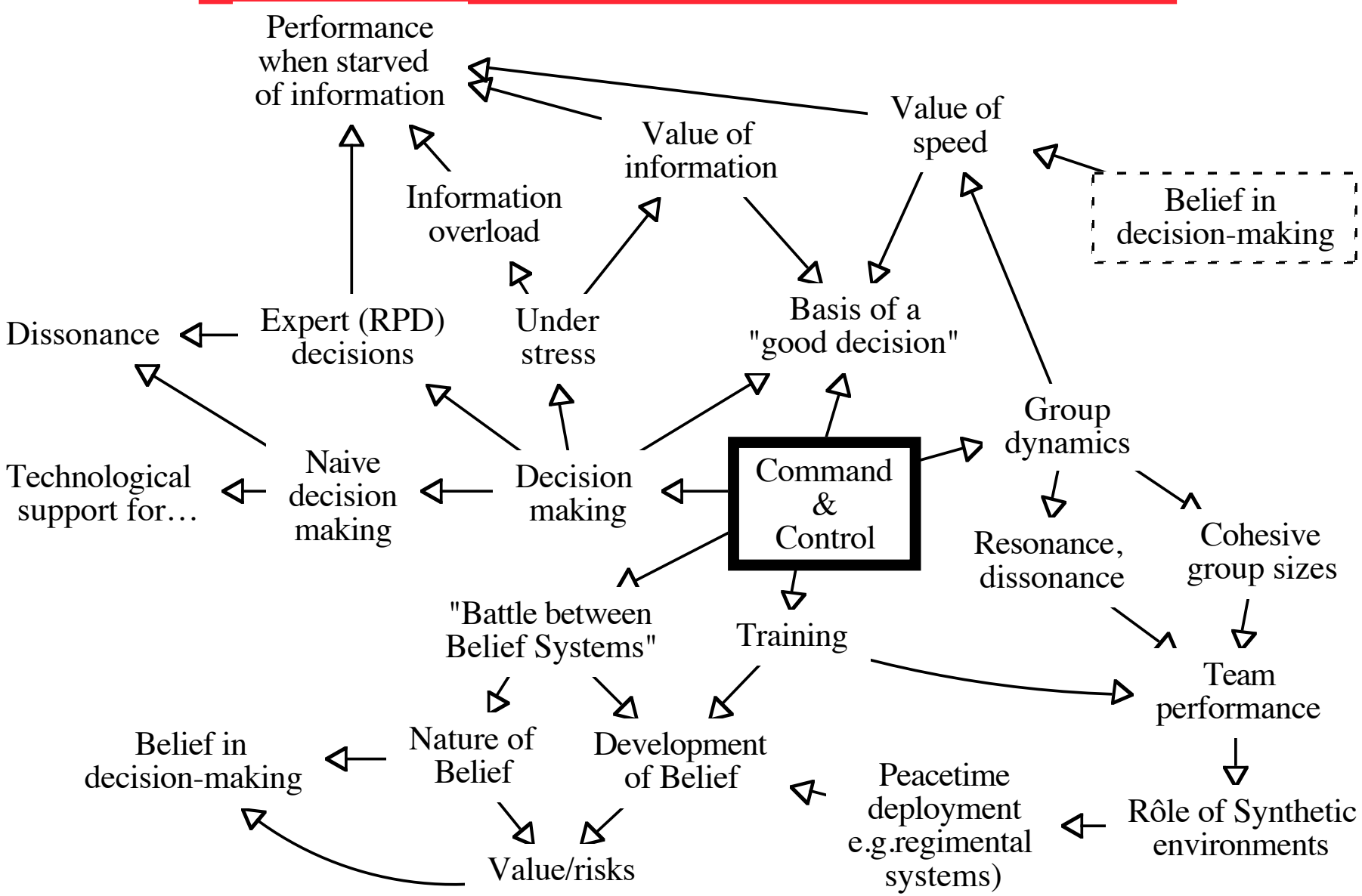
- Would-be Peace force arrives in transition
- Indigenous police
  - Local intelligence
  - Compatible ethic?
  - Infiltrated?
- Other Nations - mixed motives?

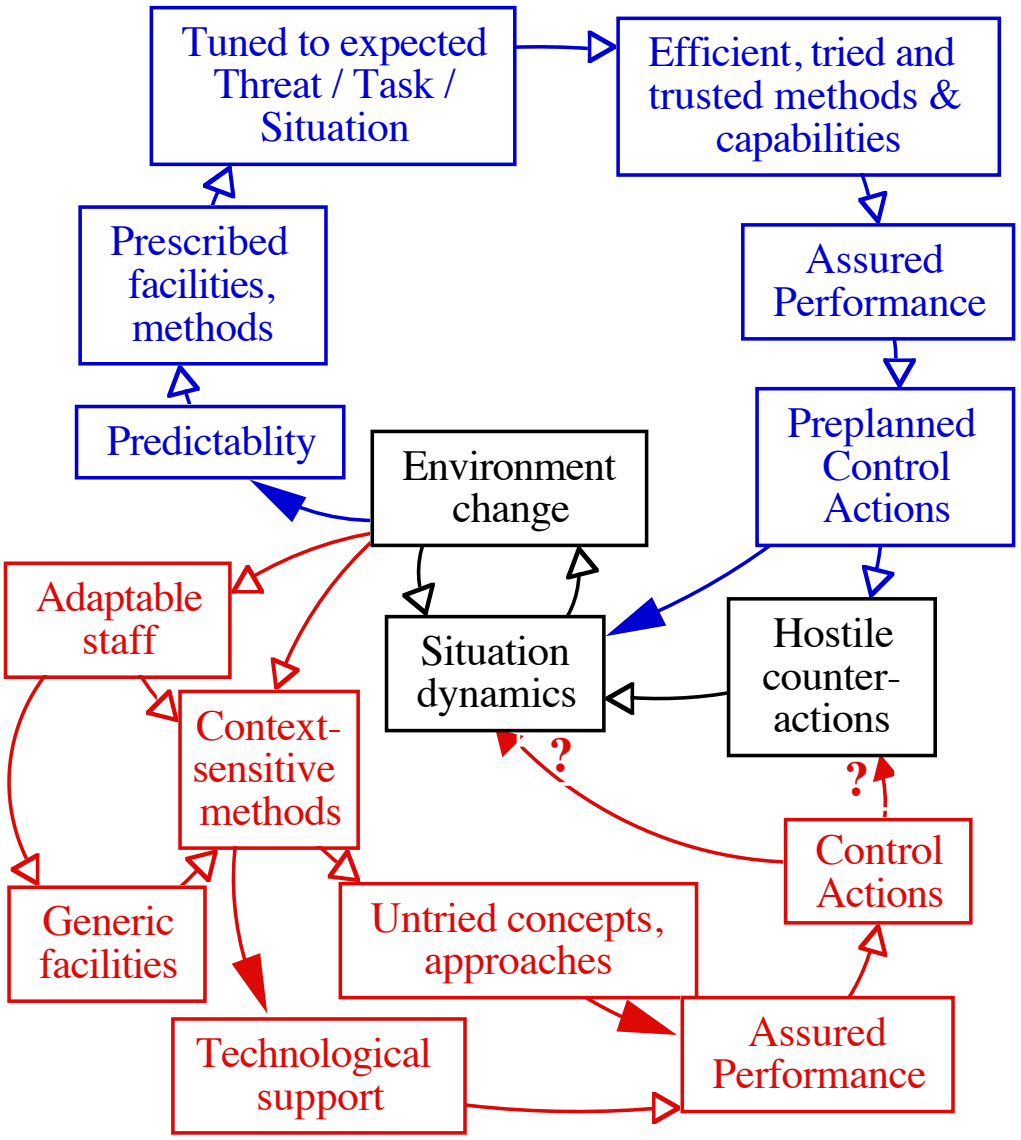
Central Themes Relevant to Decision-Making



- Deployment
  - time taken
  - build-up of decision-making performance
- Decision-making & Decisiveness
  - belief systems
  - teaming
  - planning
- Architectures
  - technological
  - fractal C2
  - flat C2
  - *ad hoc*
  - vulnerability
- Adaptability
  - technological prescription
  - synthetic environments
  - belief systems
  - coping with uncertainty
  - doctrinal changes

Decision-making & Psychology





Technological prescription in New or Dynamic Situations

- Upper loop—low risk, efficient, but ineffective
- Lower loop—higher risk, less efficient, more likely to be effective
  - can risk, implicit in lower loop, be ameliorated?

Presentation

- With v. few exceptions…
- The chaos of conflict does ***not*** lend itself to prescriptive solutions
- Nonetheless…
  - Military continue to *seek* prescriptive solutions
  - Industries continue to *supply* prescriptive solutions
  - Concomitant general distrust of *instinct*, in favour of supposed *"rational logic"*

Presentation explores structure, dynamics and psychology of C^2 decision-making

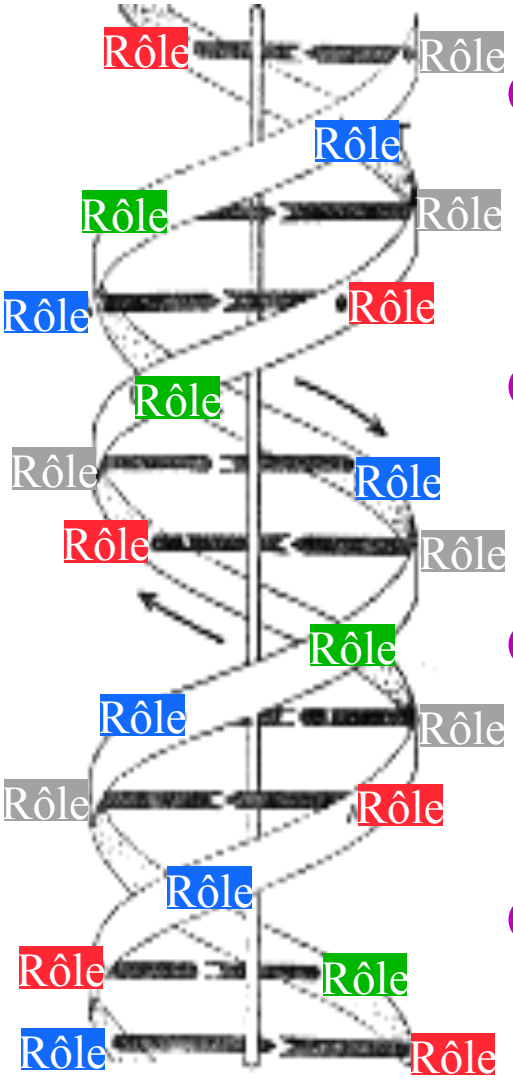
Aim:

To identify a *decisive* rôle for C^2 technology

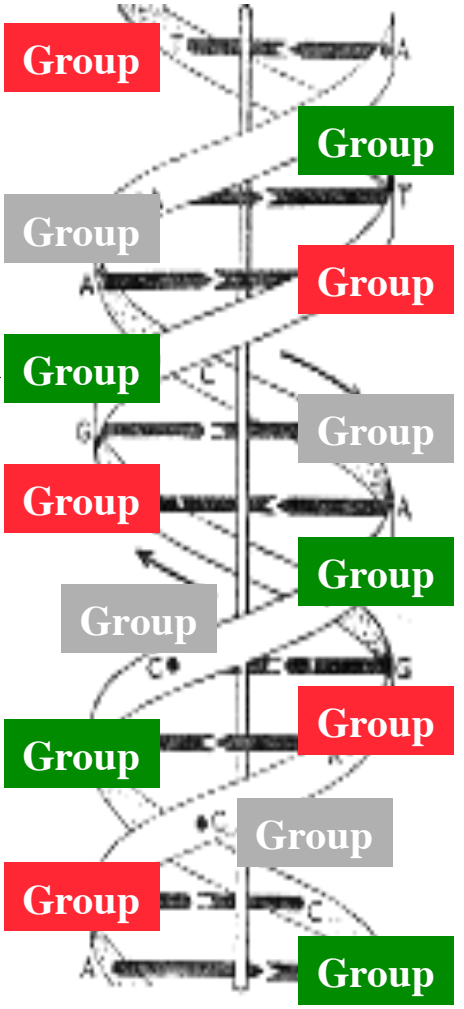
The ©Social Genotype

A Theory of Social Structure,
Belief and Behaviour

The Social Genotype©—Basis of Identity, Culture and Adaptive Social Behaviour



- Analogue/extension of DNA
  - …which expresses identity of individual.
- Social Genotype expressed in identity/culture of social group
- Rôles/groups and relationships form stable, palpable structures
- Relationships mediated by shared beliefs



Social Genotype—Aspects

- Social Genotype takes time to form within nascent social group, and time to set
- Once set, evolves only slowly, resists rapid change
  - rôle-relationship mesh "glued" by shared beliefs
- Determines the identity/culture of society or group
  - Individual behaviour coloured by cultural norms
  - New Recruits accepted only if "likely to fit in"
  - New Recruits "learn the ropes"—adopt rôle—or ejected—"immune response"
- Individuals come and go, rôle-relationship structure goes on (c.f. body cells replaced, identity of individual remains)
- Like Genes, a Social Genotype may live for ever…

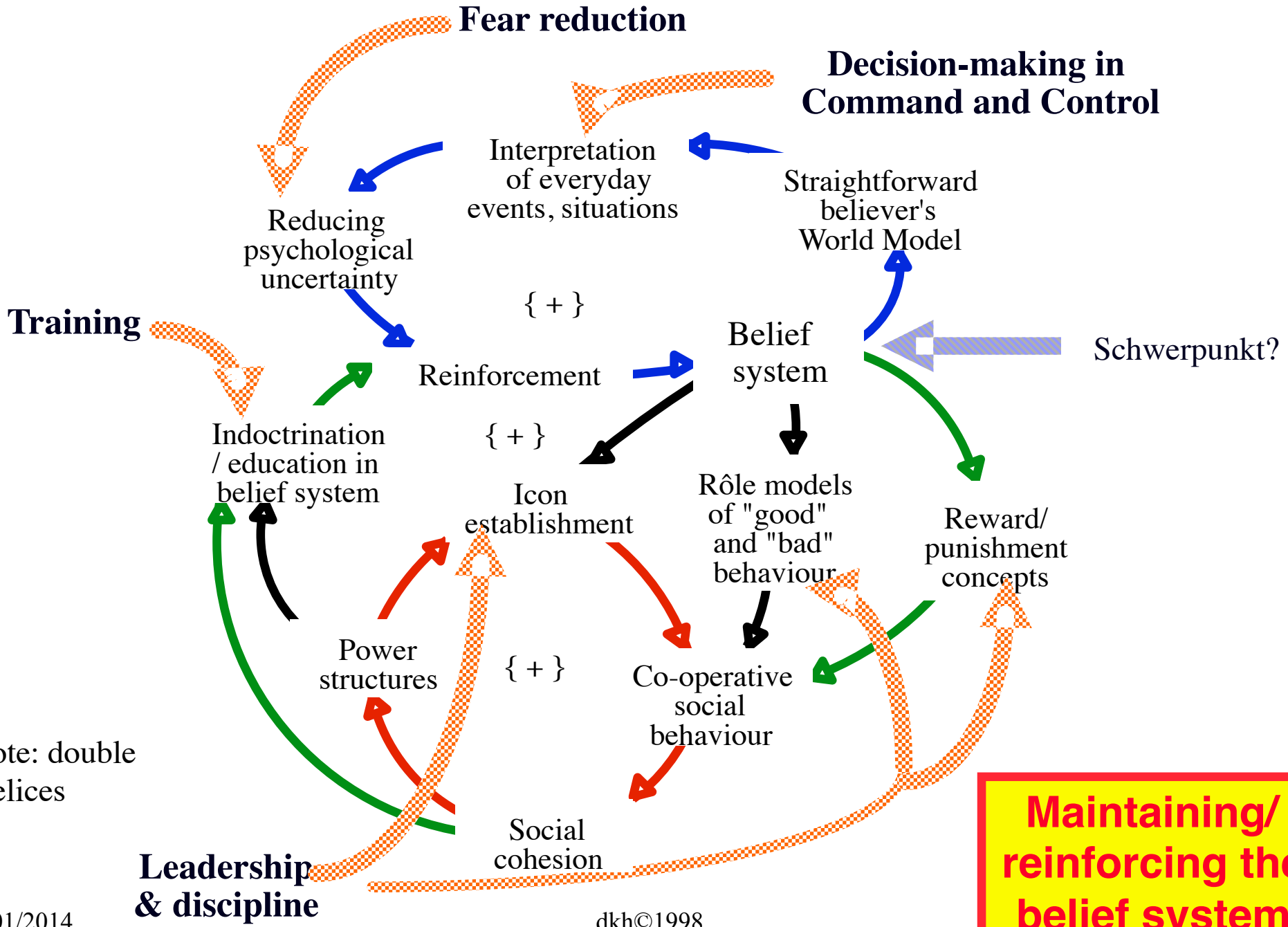
Social Genotype—Application

- Explains longevity of, and paradoxes in, social behaviour patterns
  - Religious ritual—Christian service unchanged since 4th Century A.D.
  - Cultural tradition
  - Ethnic conflicts lasting hundreds of years
    - Basques
    - N.Ireland
  - Reversion to earlier fault-lines
    - Traditional county boundaries
    - Former Yugoslavia
    - West Africa
- Understanding the evolution of C2 team decision-making

Rôle of Belief in Decision-Making

The Nature of Belief

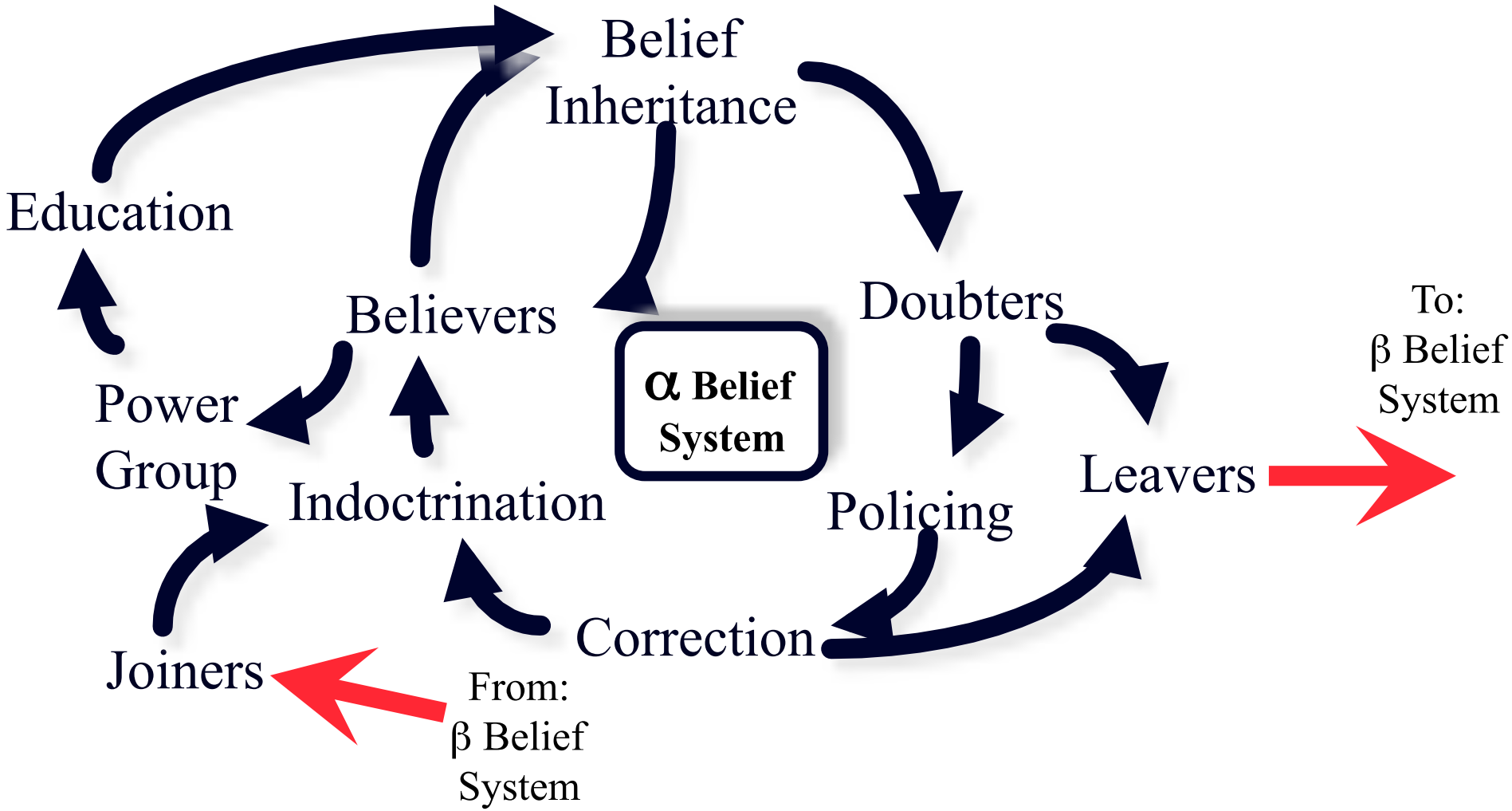
- Beliefs permit rapid reaction in uncertain situations
  - homo sapiens evolved through swift fight or flight decisions
  - based on ability to categorize, like stereotypes
- Beliefs persist if they give *"satisfactory explanations "*
  - Belief in drugs, crime, music, youth…tenable *if* they *work*
  - "Ground truth" *irrelevant*. Beliefs not rational/logical
  - "New" beliefs continually being generated and tested
    - without check in an individuated society with no institutionalized counter—ethics, morality, etc.
    - Process may be chaotic in Open Societies
- Self-perpetuating through generations—in Social Genotype? (N. Ireland, Yugoslavia, Russian Religion…)



Note: double helices

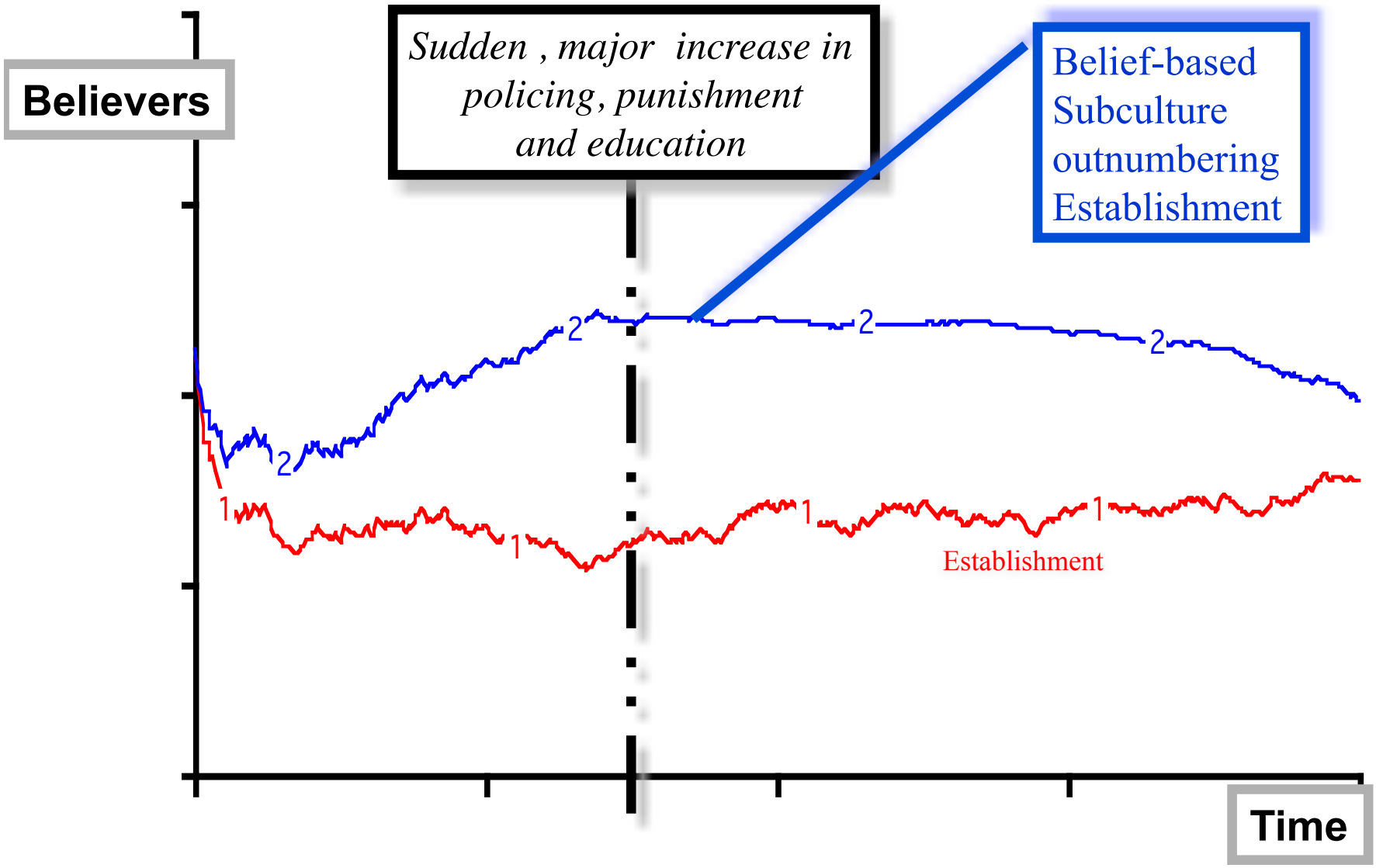
Maintaining/ reinforcing the belief system

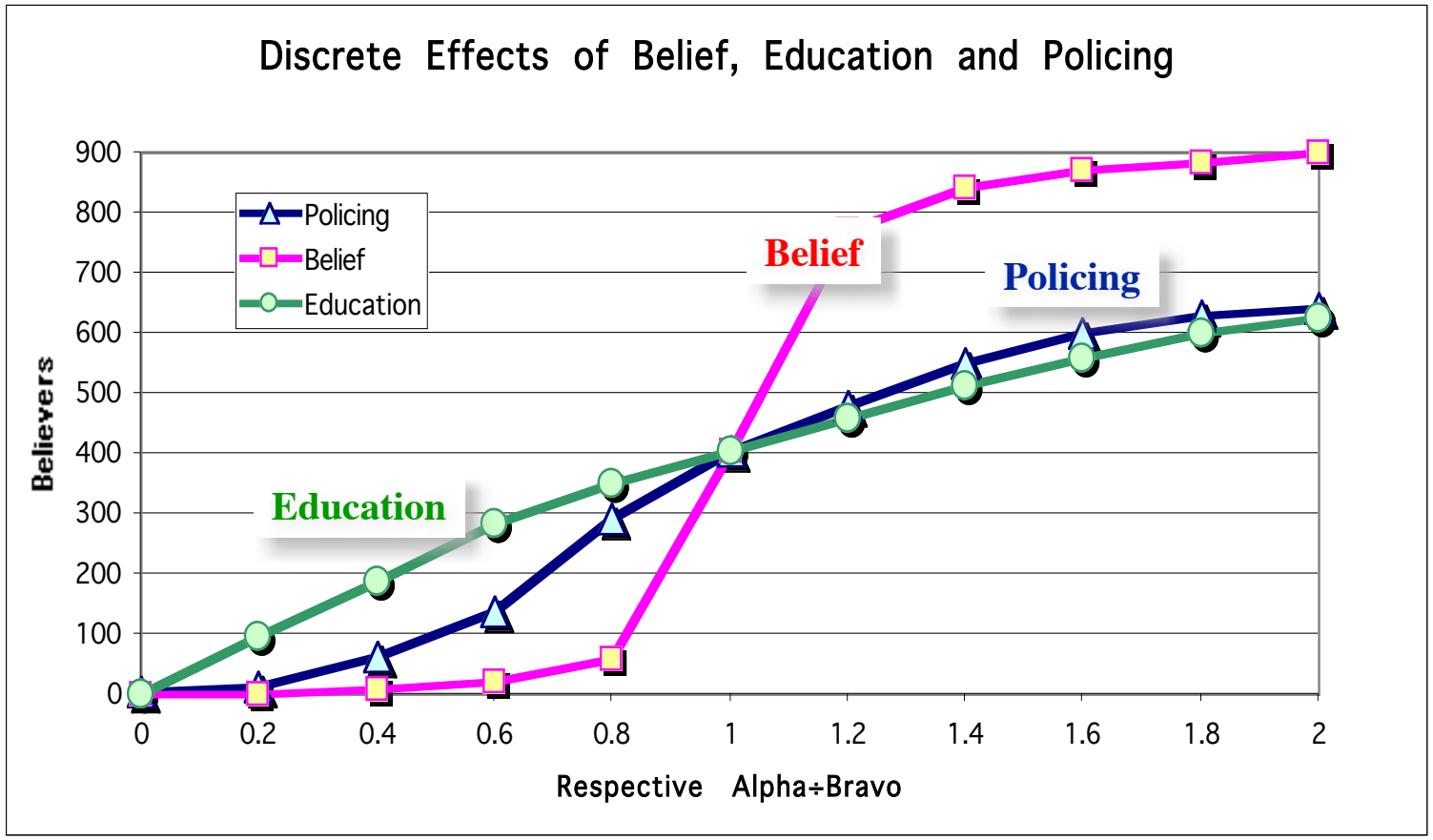
A Differential Model of Belief System Dynamics



- Joining two or more such models enables ***differential*** interactions between belief systems to be explored

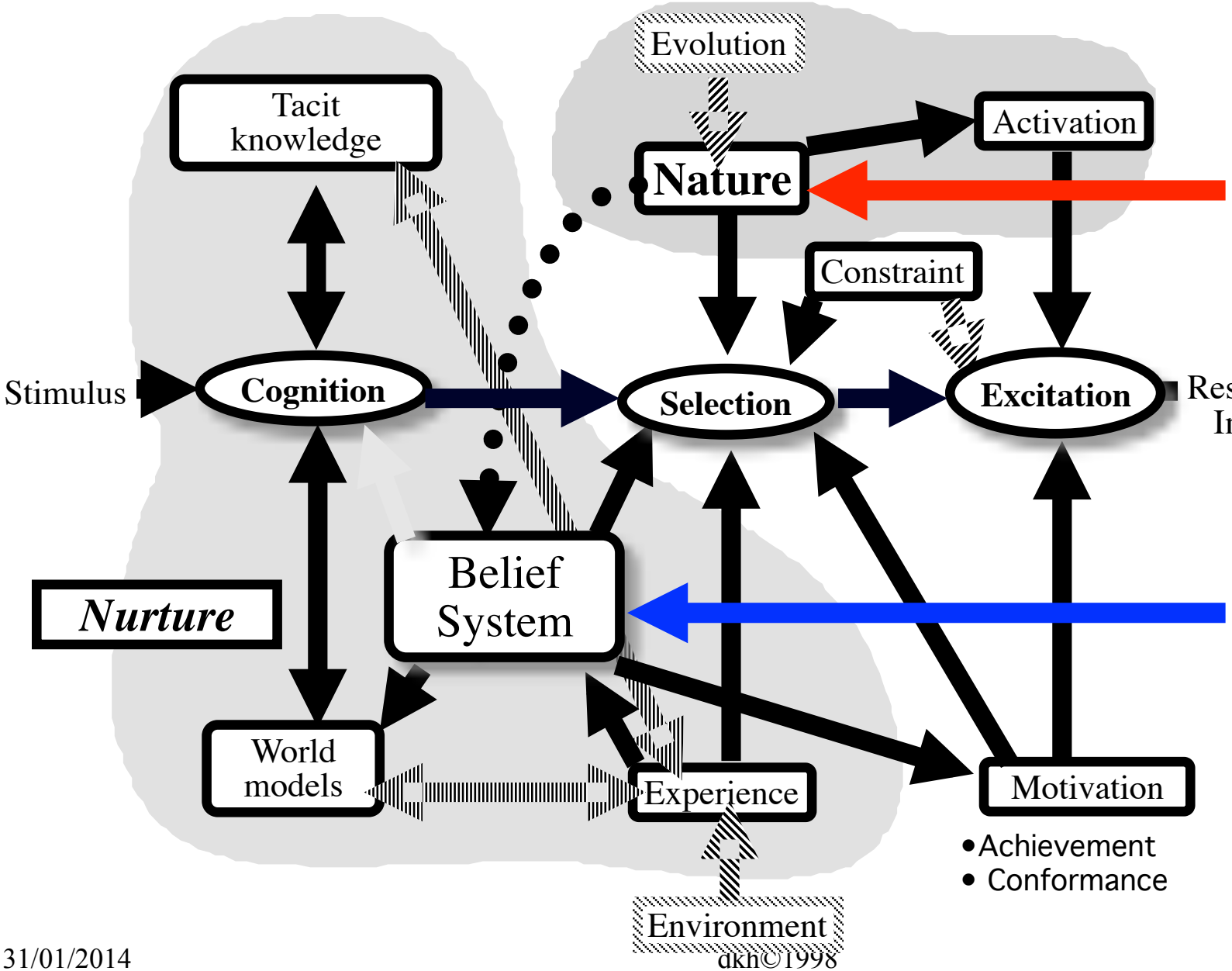
Belief Vs. Policing, Punishment and Education





- Two identical belief systems, α and β, competing for believers.
- β Belief System is held at nominal—believers interchange according to differences in respective education/indoctrination, policing and strength of belief
- Policing—threshold effect; higher levels ➔ diminishing returns
- Education—even a little helps; higher levels ➔ diminishing returns
- Strength of Belief ("believability") has major effect—sigmoid approximates to 2-state system

GRM—Behaviour Management



- Instinct
- Collective Unconscious
- Archetypes
- Libido
- Aggression
- Energy
- Emotion
- Character

- Beliefs
- Rôles
- Stereotypes
- Categories
- Values
- Ethics
- Morals
- Ideologies
- Training

- Achievement
- Conformance

dkh©1998

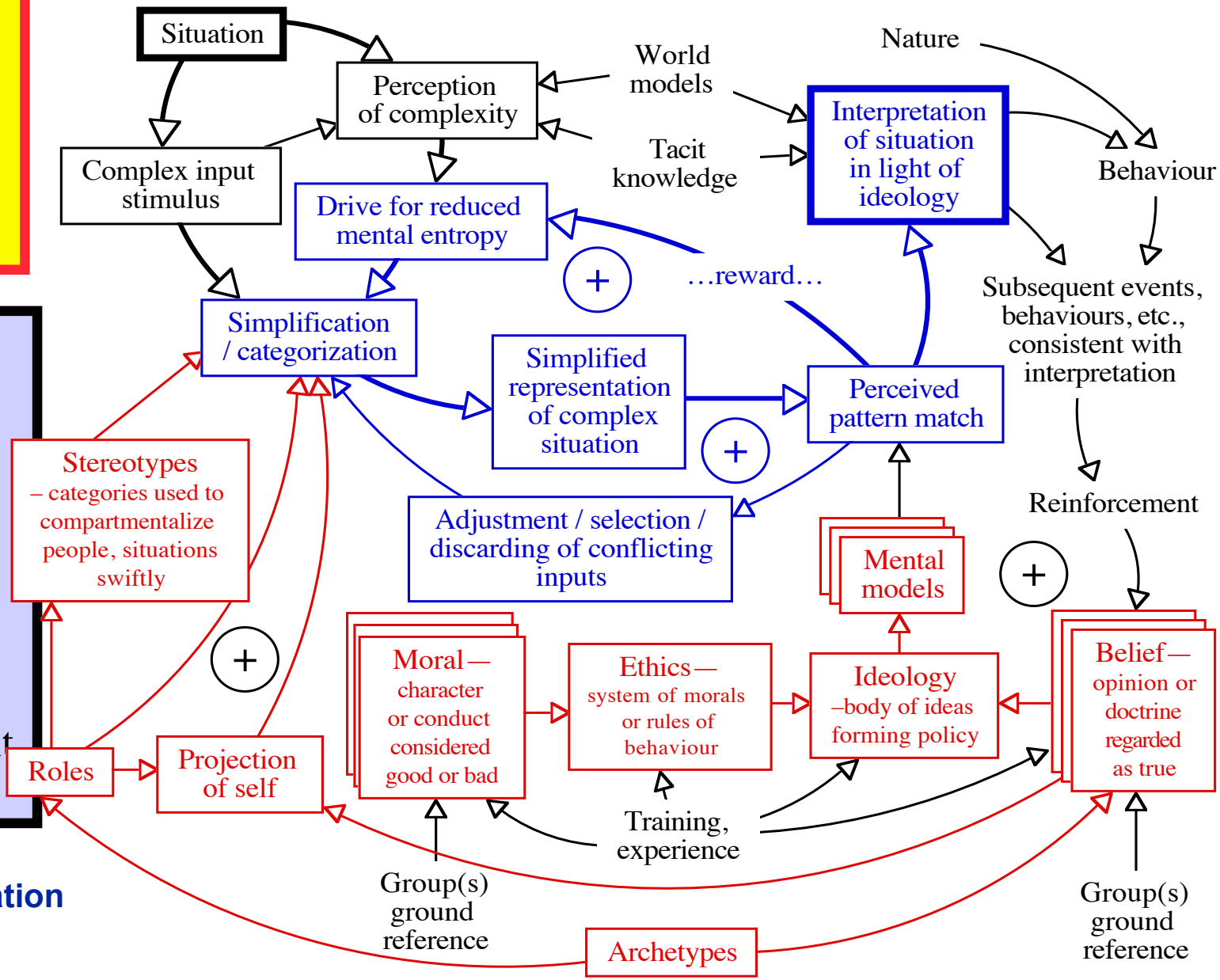
Belief & Decisions

- Belief fundamental to survival
  - No time to evaluate every situation from scratch
  - Instead, categorize, stereotype, assess and decide swiftly using beliefs
    - 'perceptions of "how the world works" '
- No reason for beliefs to be rational
  - Historically, *rarely* "true"
- Must work, however—give satisfactory answers
- Belief and ideology inescapable…
- …and at the heart of so-called *rational* decisions

Mechanistic "decisions"—
so-called "objective", or "uninvolved"—
omit humanity, ethics, morals…

Conceptual Belief System Reference Model

Recent research (SciAm Jul'98) reports left brain propensity for creating a 'story-line'—even filling-in blanks with false "memories", yet honestly believing it all to be true!



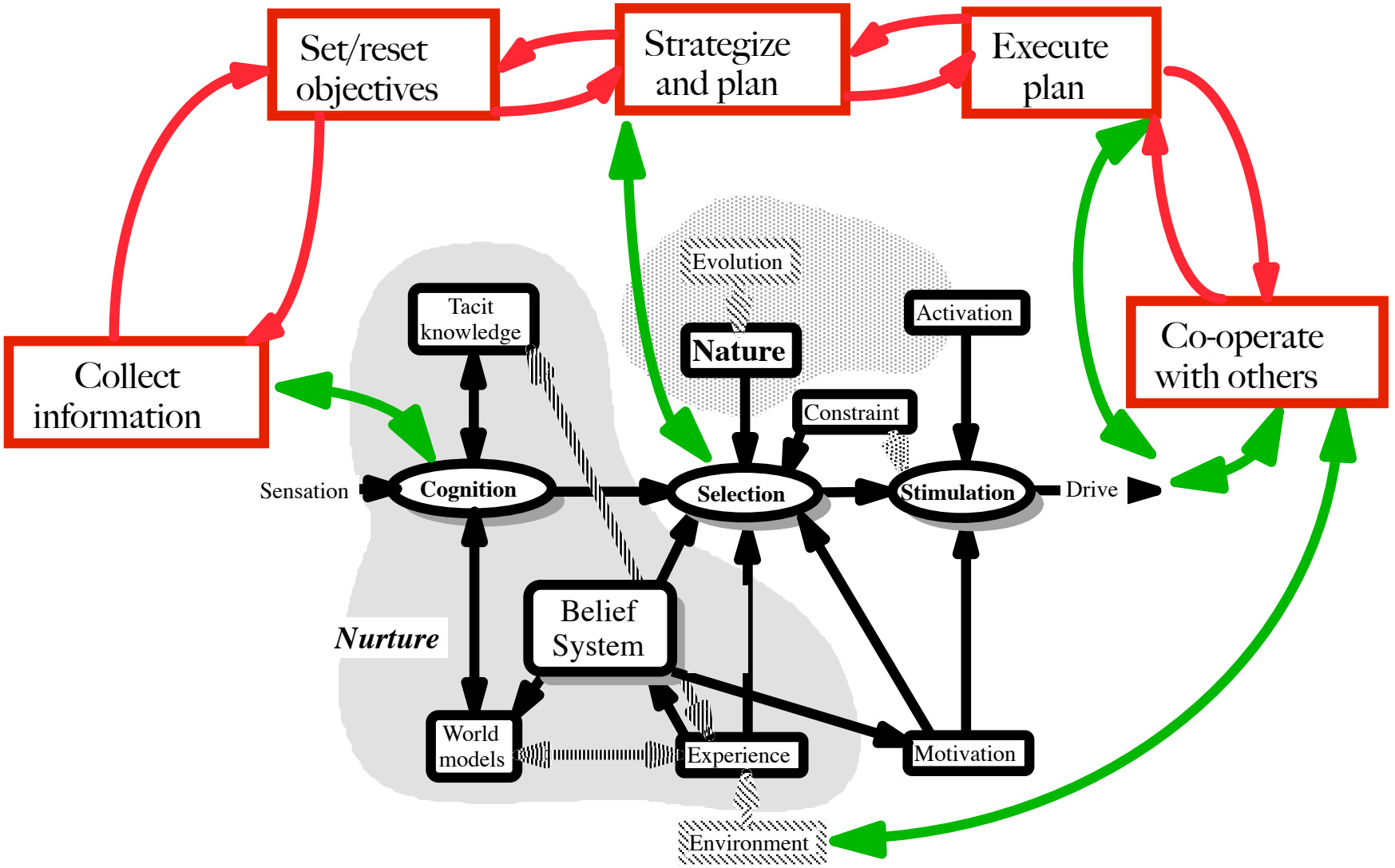
Situation Interpretation Belief System

Conceptual Belief System Operation

- Empirically based
- Contains a number of reinforcing loops which maintain:—
  - Beliefs, ideology and mental models
  - Roles, stereotypes, Jung's Shadow*, Projection of Self, Persona…
  - * Attribution of our worst conceptual behaviours ("dark side") to another person, supposing him/her as likely to behave in such a manner
  - Preferential choice of data reinforcing current beliefs and ideology
- The whole is driven and sustained by desire for cerebral entropy reduction—characteristic of human behaviour
- Result is an *interpretation* of a situation in the light of current ideology—hence, decision-maker's biases
- Ethics and morals, too, are not absolute, being adjusted in line with group ideals
- Illustrates how familiarity reduces perceived complexity

* Campbell, Joseph (Ed.), 1971, *The Portable Jung*, Chap 6.II, Penguin Books, USA

Some Mission and Behaviour Models—Interactions



For many, it is only possible to see ***once they believe…***

Decision-team Evolution & Dynamics

Obstacles to Effective & Immediate Decision-making on Arrival in Territory

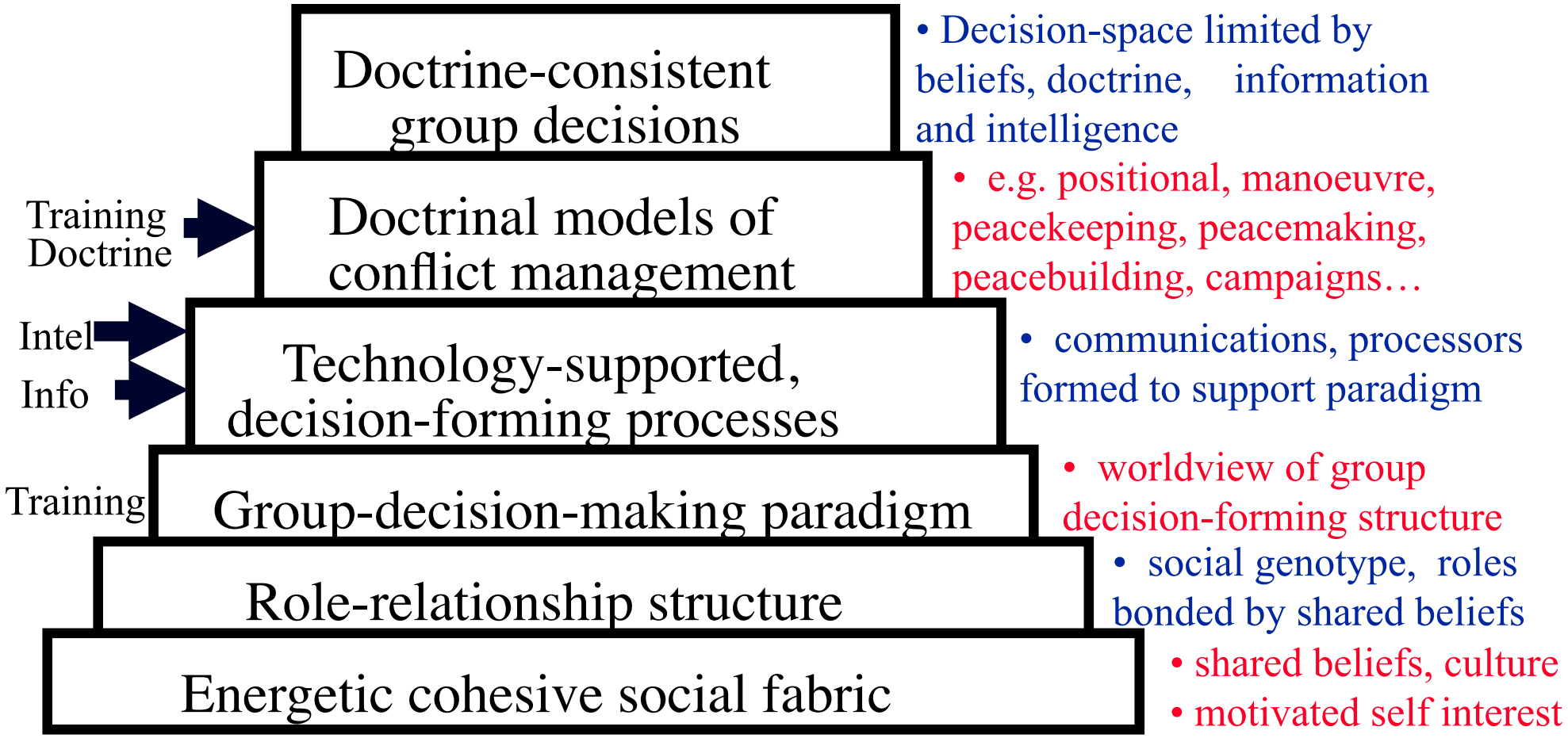
- In the general case, a multi-national Peace Keeping/Making/ Building team composed of many people, variously trained/ experienced, varied motivations…

1. Adaptation to unfamiliar environment
2. Decision-makers—from different origins
   —arriving individually

Need time…

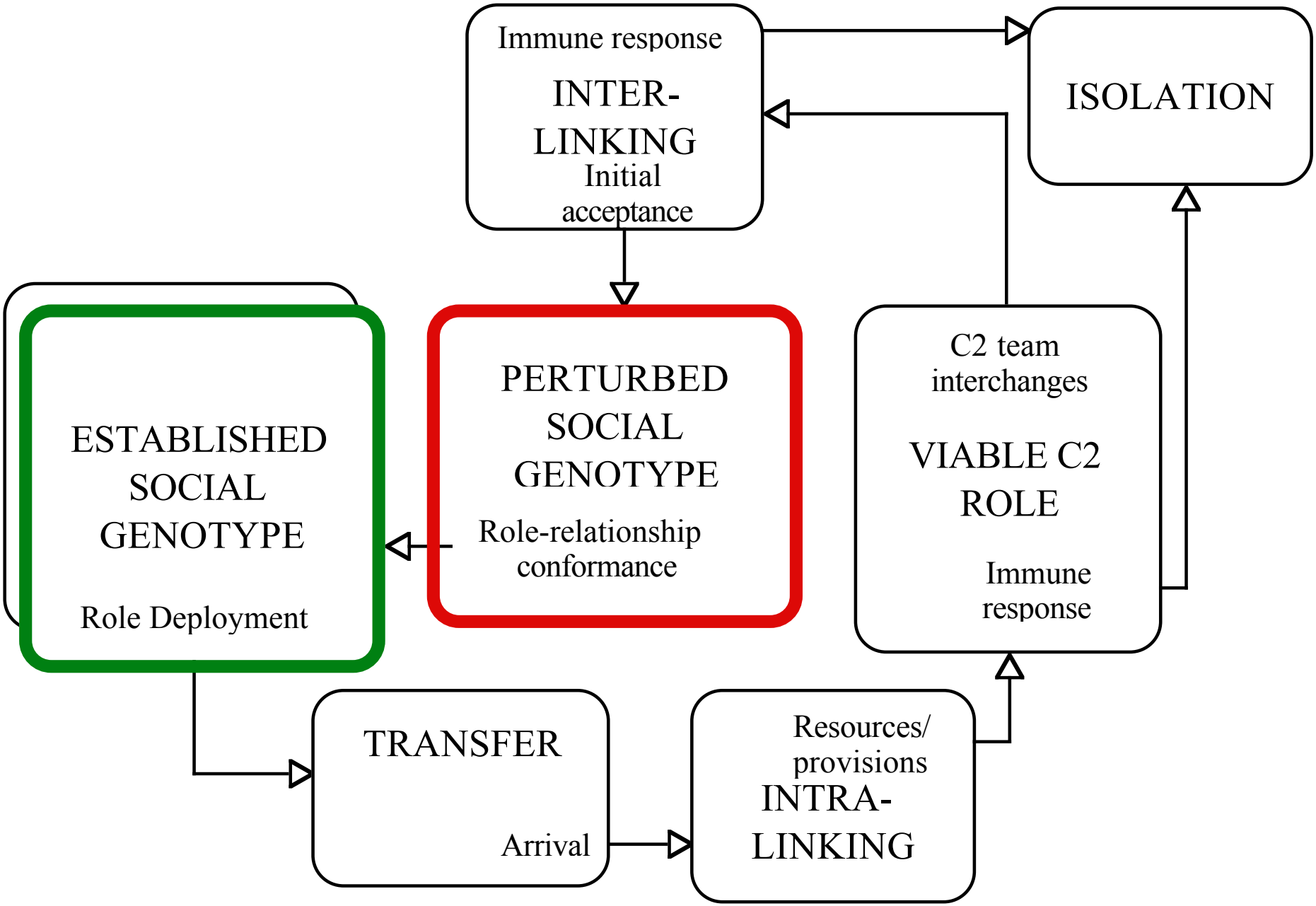
3. Time for decision-team-building, practice, experience
4. Time to establish, validate and expand sources of Intelligence
   —especially indigenous police
   —contacts in other Units
   —local champions, snouts, etc.
5. Time to create communications web—evolved, ***not designed***
6. Time to make technological support focused and effective

The C2 decision pyramid

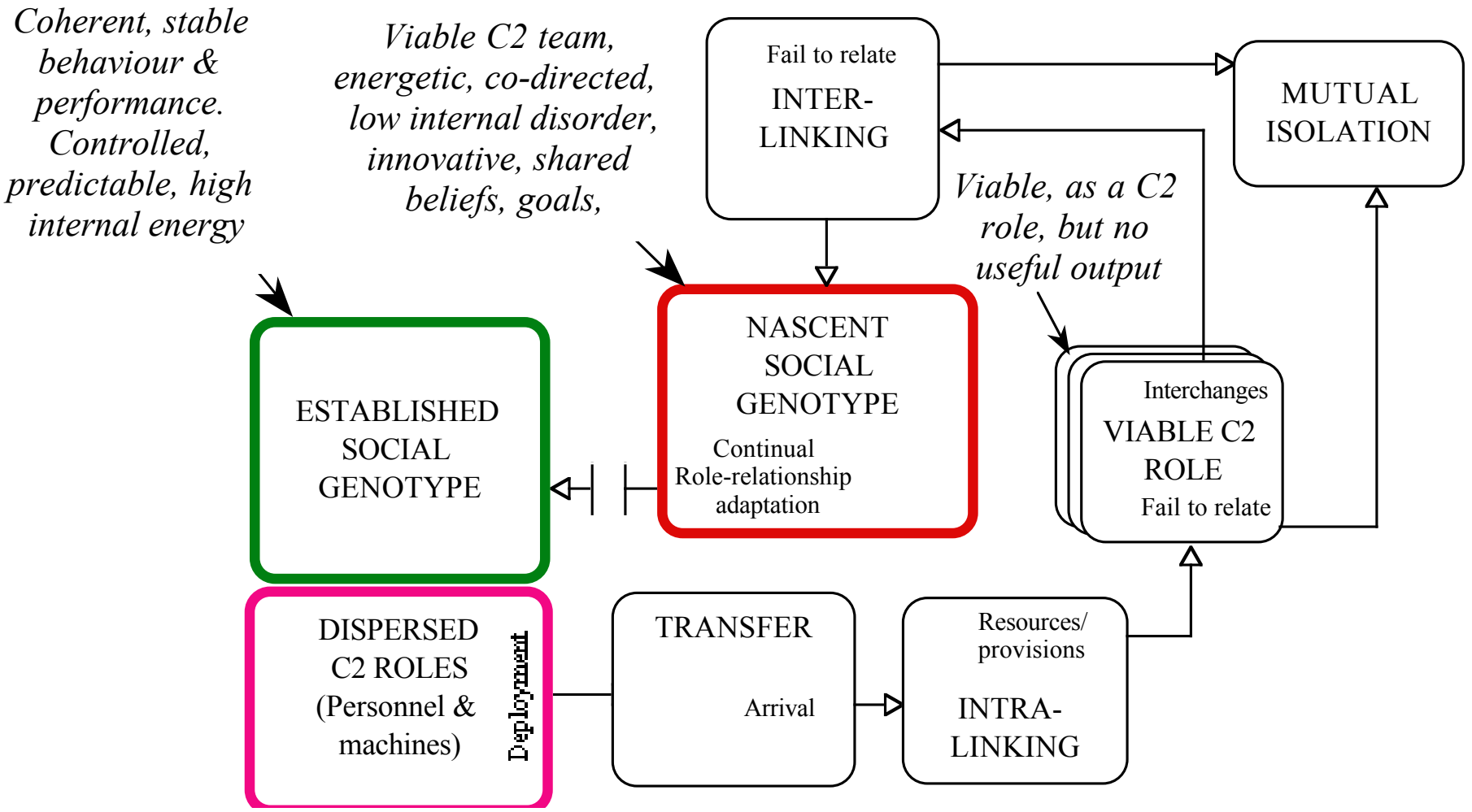


N.B. C2 organizations will set in place each of the lower layers in turn, finally producing the top level output

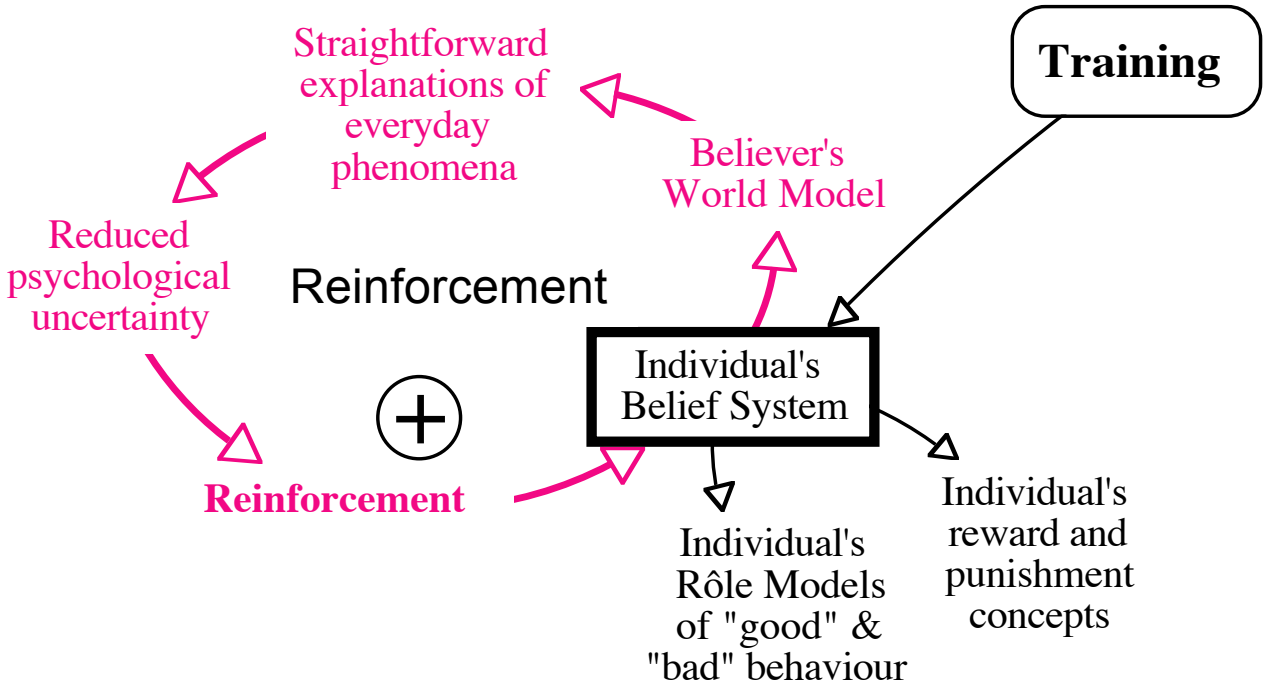
Established C2s, Role Transfer—Reference Model



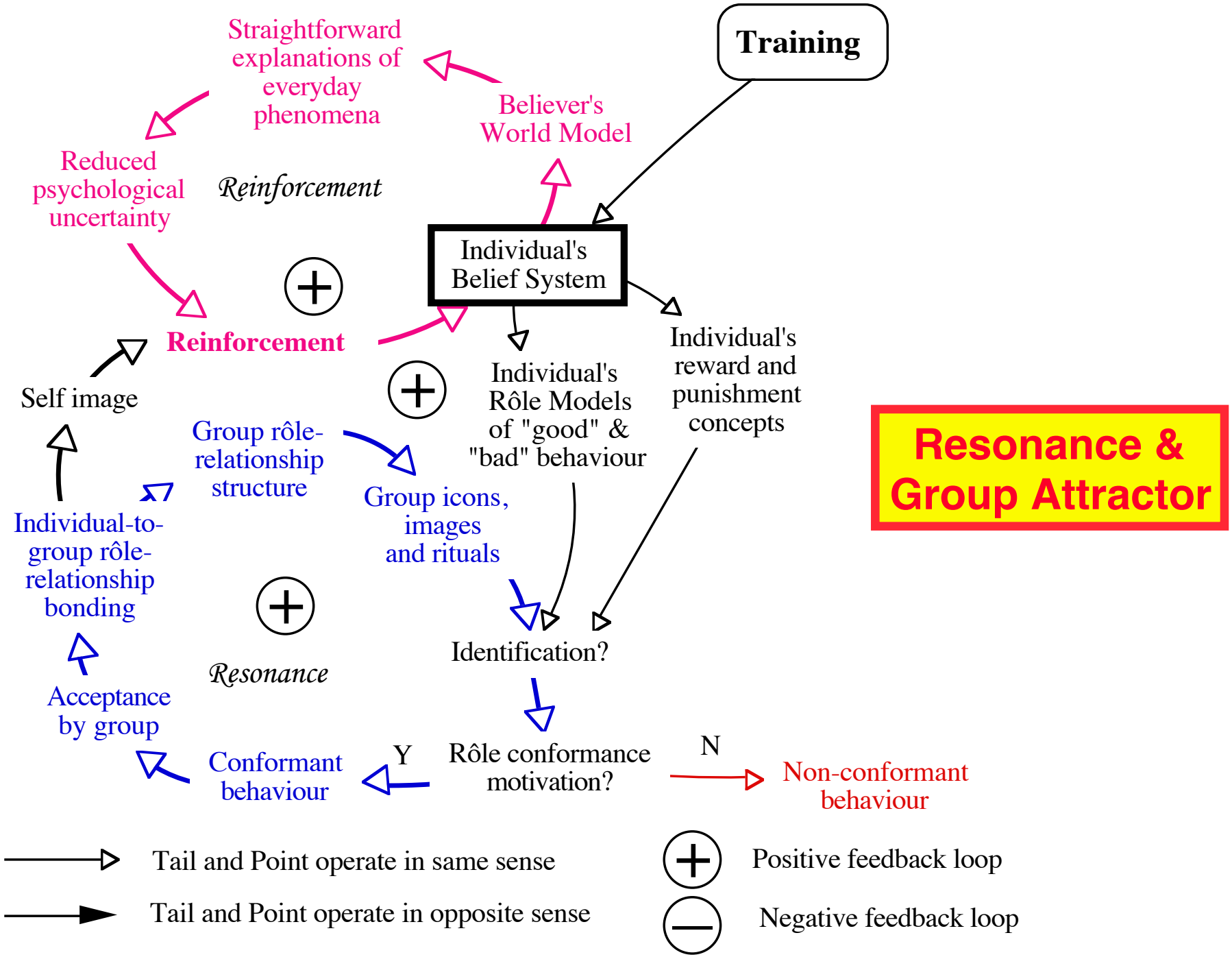
C² Start-up—State Model

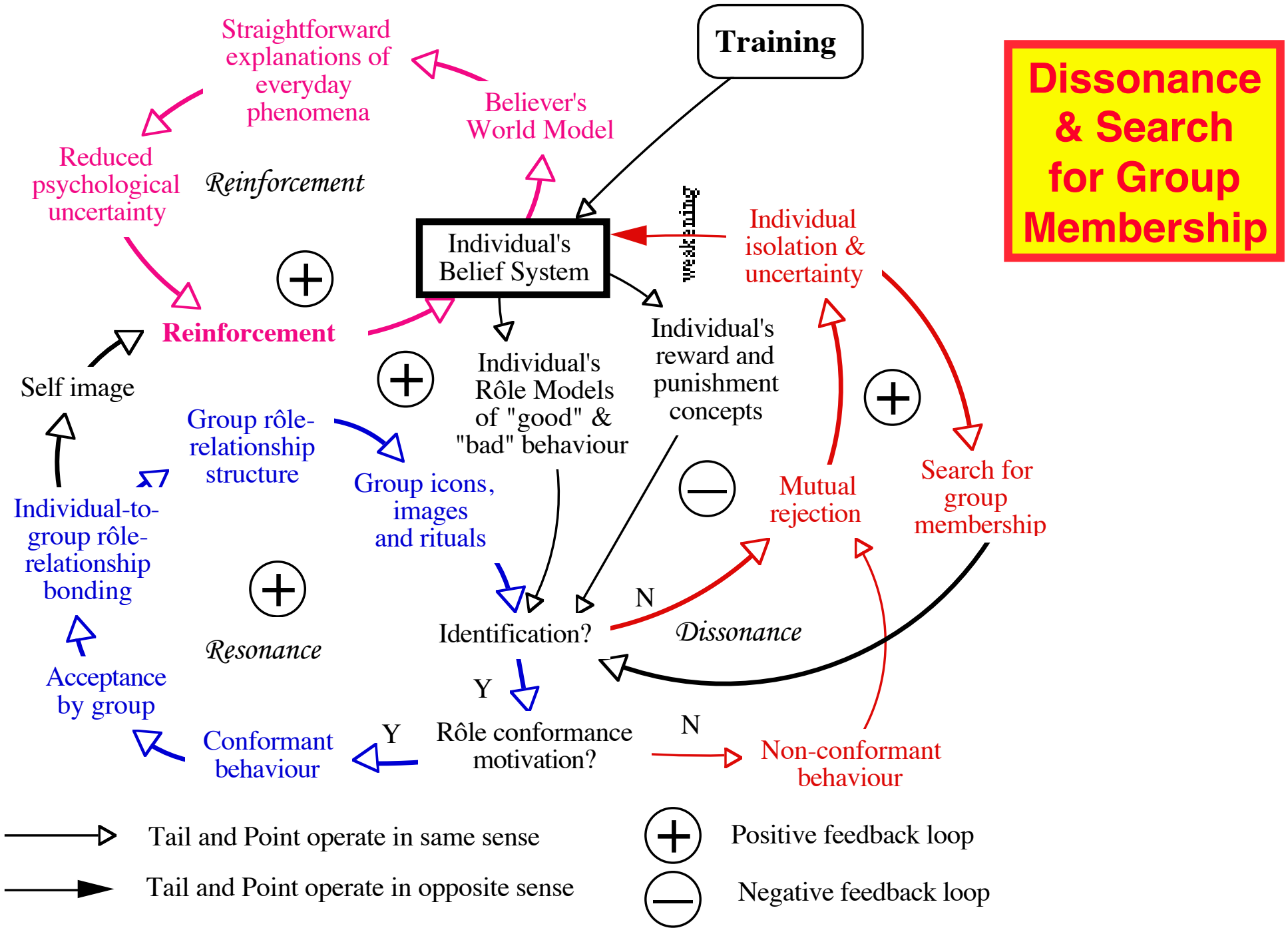


Belief & Persona



N.B. The work presented in this and the next three slides was carried out originally for Surrey Police


Training
Straightforward explanations of everyday phenomena
Believer's World Model
Reduced psychological uncertainty
Reinforcement
Individual's Belief System
Reinforcement
Individual's reward and punishment concepts
Self image
Individual's Rôle Models of "good" & "bad" behaviour
Group rôle-relationship structure
Group icons, images and rituals
Individual-to-group rôle-relationship bonding
Resonance
Identification?
Acceptance by group
Conformant behaviour
Y
Rôle conformance motivation?
N
Non-conformant behaviour
Resonance & Group Attractor
Tail and Point operate in same sense
Tail and Point operate in opposite sense
Positive feedback loop
Negative feedback loop


Dissonance & Search for Group Membership
Training
Straightforward explanations of everyday phenomena
Believer's World Model
Reduced psychological uncertainty
Reinforcement
Individual's Belief System
weakening
Individual isolation & uncertainty
Reinforcement
Self image
Individual's Rôle Models of "good" & "bad" behaviour
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Group rôle-relationship structure
Group icons, images and rituals
Individual-to-group rôle-relationship bonding
Mutual rejection
Search for group membership
Resonance
N
Identification?
Dissonance
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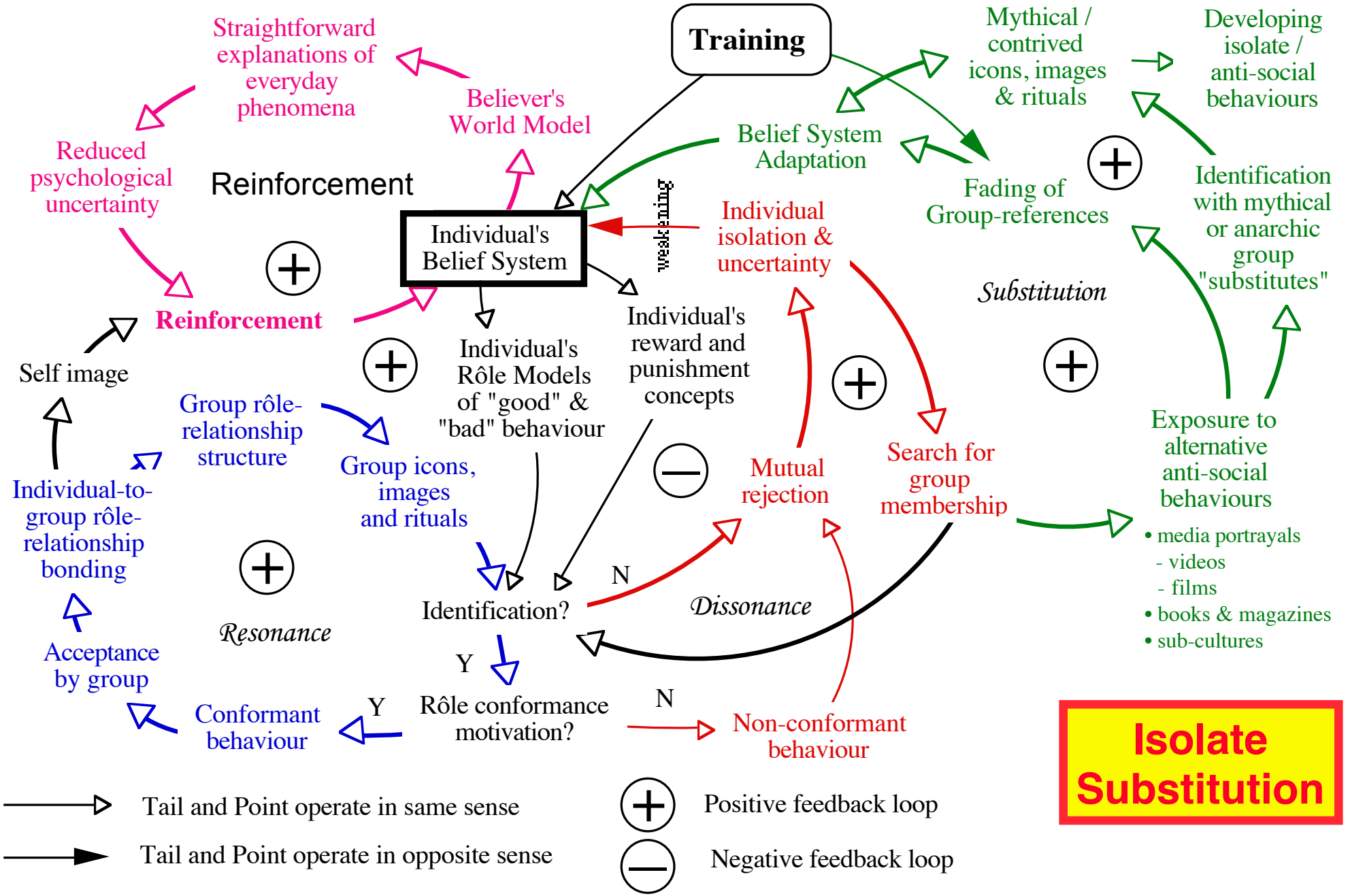
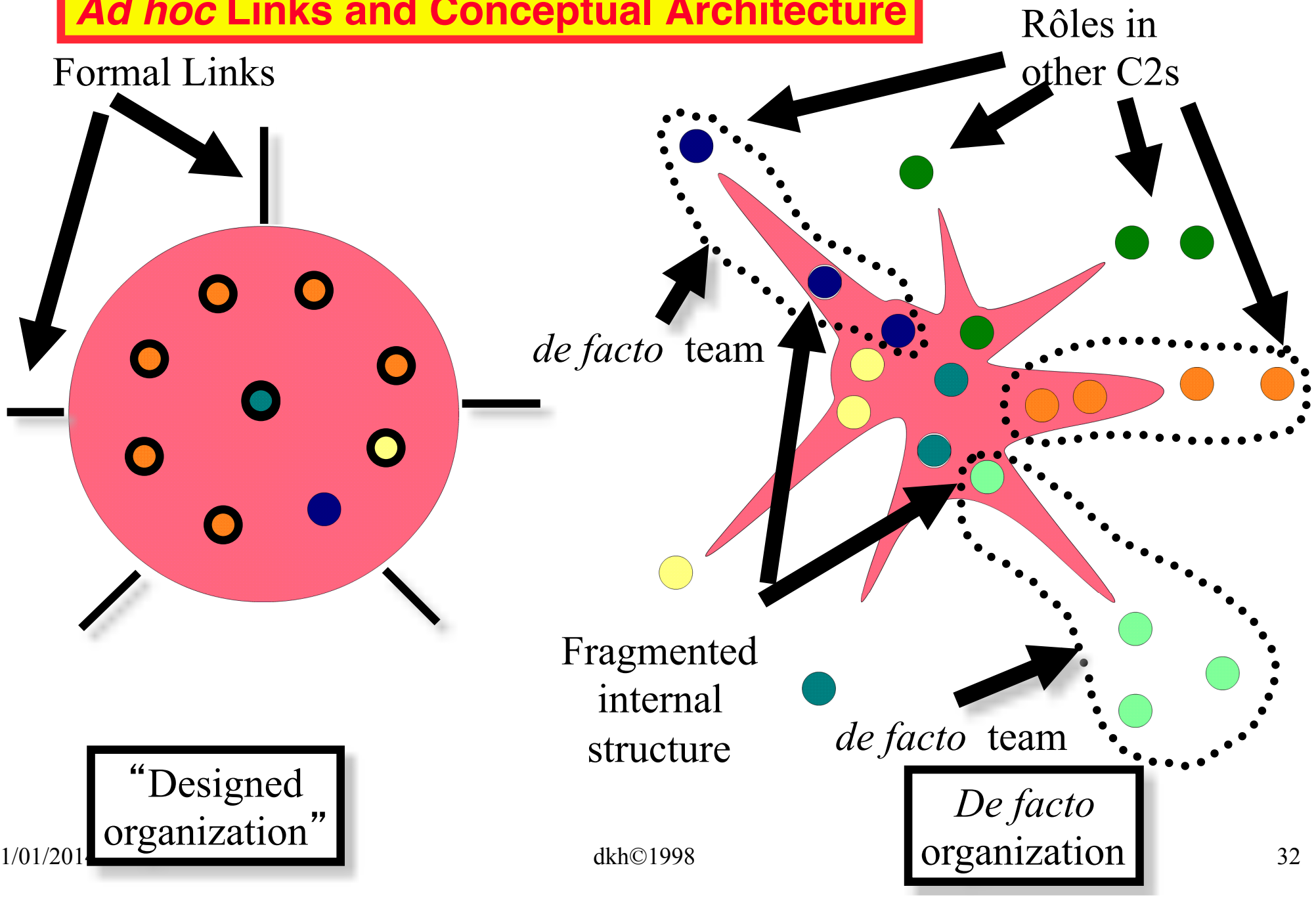
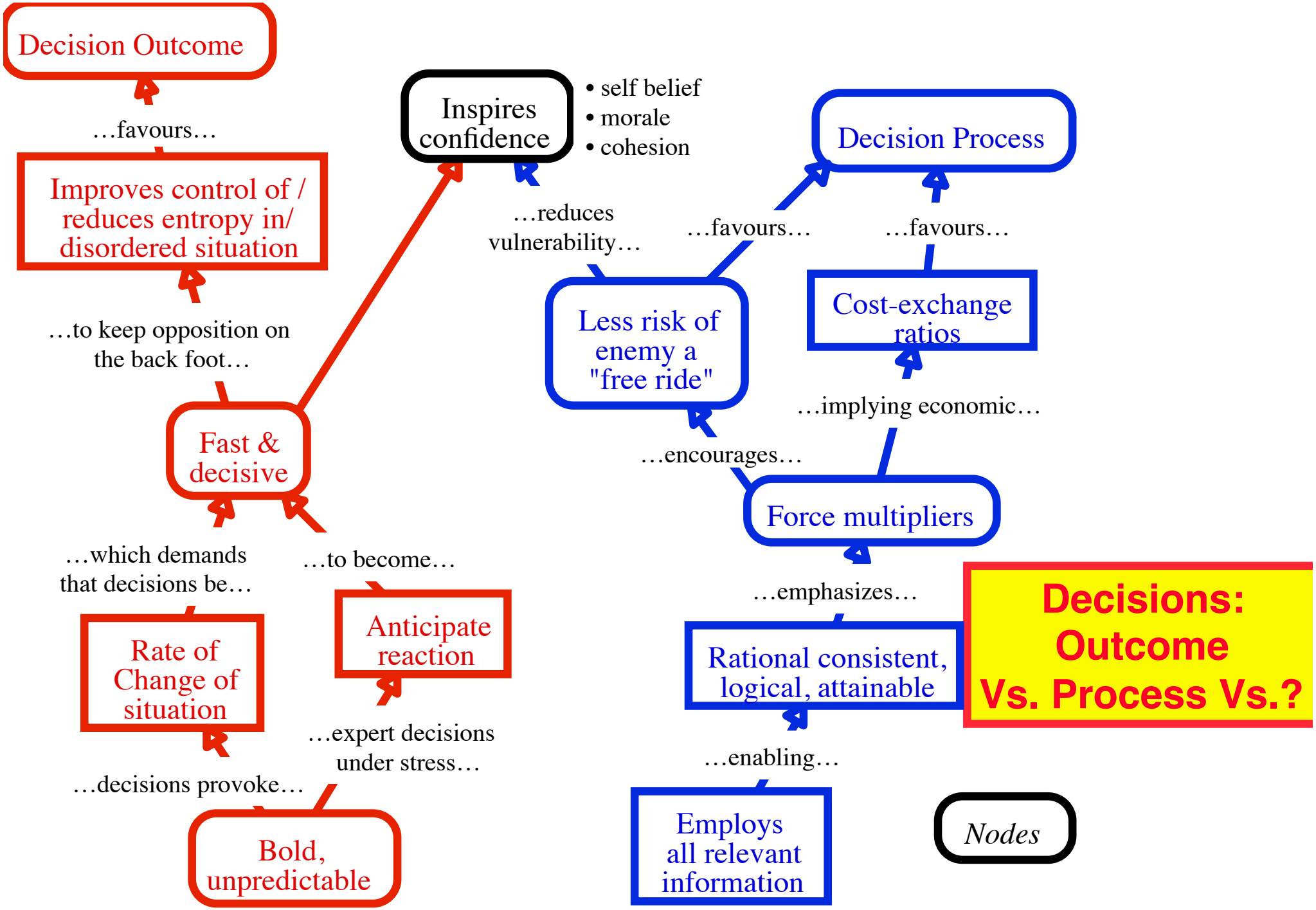

Training
Straightforward explanations of everyday phenomena
Believer's World Model
Reduced psychological uncertainty
Reinforcement
Individual's Belief System
weakening
Individual isolation & uncertainty
Belief System Adaptation
Mythical / contrived icons, images & rituals
Developing isolate / anti-social behaviours
Fading of Group-references
Identification with mythical or anarchic group "substitutes"
Substitution
Reinforcement
Self image
Individual's Rôle Models of "good" & "bad" behaviour
Individual's reward and punishment concepts
Group rôle-relationship structure
Group icons, images and rituals
Individual-to-group rôle-relationship bonding
Mutual rejection
Search for group membership
Exposure to alternative anti-social behaviours
• media portrayals
- videos
- films
• books & magazines
• sub-cultures
Resonance
Identification?
N
Dissonance
Y
Acceptance by group
Conformant behaviour
Y
Rôle conformance motivation?
N
Non-conformant behaviour
Isolate Substitution
Tail and Point operate in same sense
Tail and Point operate in opposite sense
Positive feedback loop
Negative feedback loop

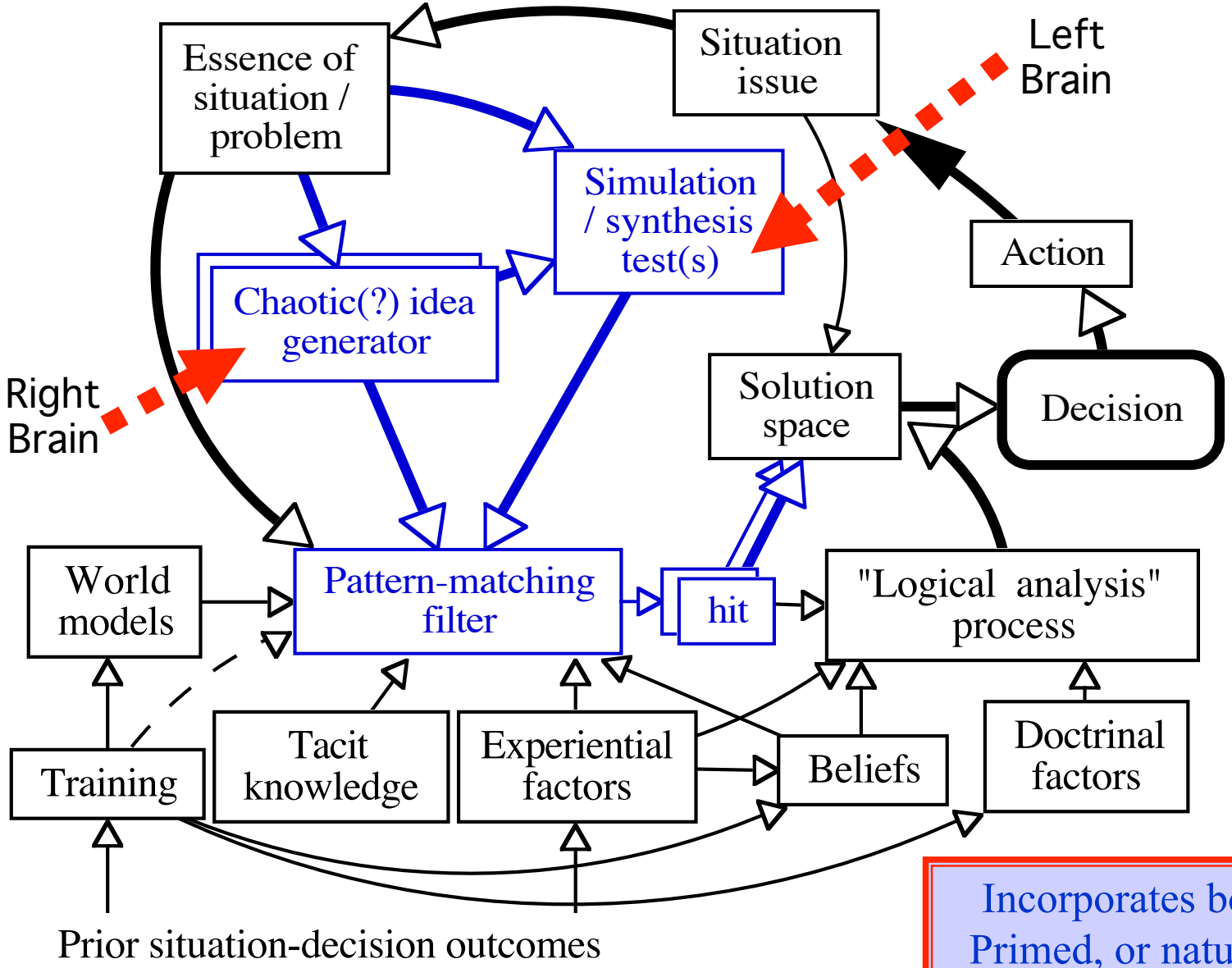
Decision-Making Architectures

Ad hoc Links and Conceptual Architecture



Decision-Making


Decision Outcome
…favours…
Improves control of / reduces entropy in/ disordered situation
…to keep opposition on the back foot…
Fast & decisive
…which demands that decisions be…
Rate of Change of situation
…decisions provoke…
Bold, unpredictable
…to become…
Anticipate reaction
…expert decisions under stress…
Inspires confidence
• self belief
• morale
• cohesion
…reduces vulnerability…
Less risk of enemy a "free ride"
…encourages…
Force multipliers
…emphasizes…
Rational consistent, logical, attainable
…enabling…
Employs all relevant information
…favours…
Decision Process
…favours…
Cost-exchange ratios
…implying economic…
Decisions: Outcome Vs. Process Vs.?
Nodes



Generic Decision - making Model

Incorporates both Recognition-Primed, or naturalistic, decision-making and structured analytical methods, e.g. The Estimate

Generic Decision- making Model

- "Naturalistic" decision-making is continual
  - *even during Logical Analysis*
  - "Situating the appreciation"
- Evolved human survival capability?
  - Unavoidable
- Re-evaluation of "instinctive" decision-making:—
  - Inevitable
  - Fast
  - Effective? For some people in some situations
- Implications for officer selection, training

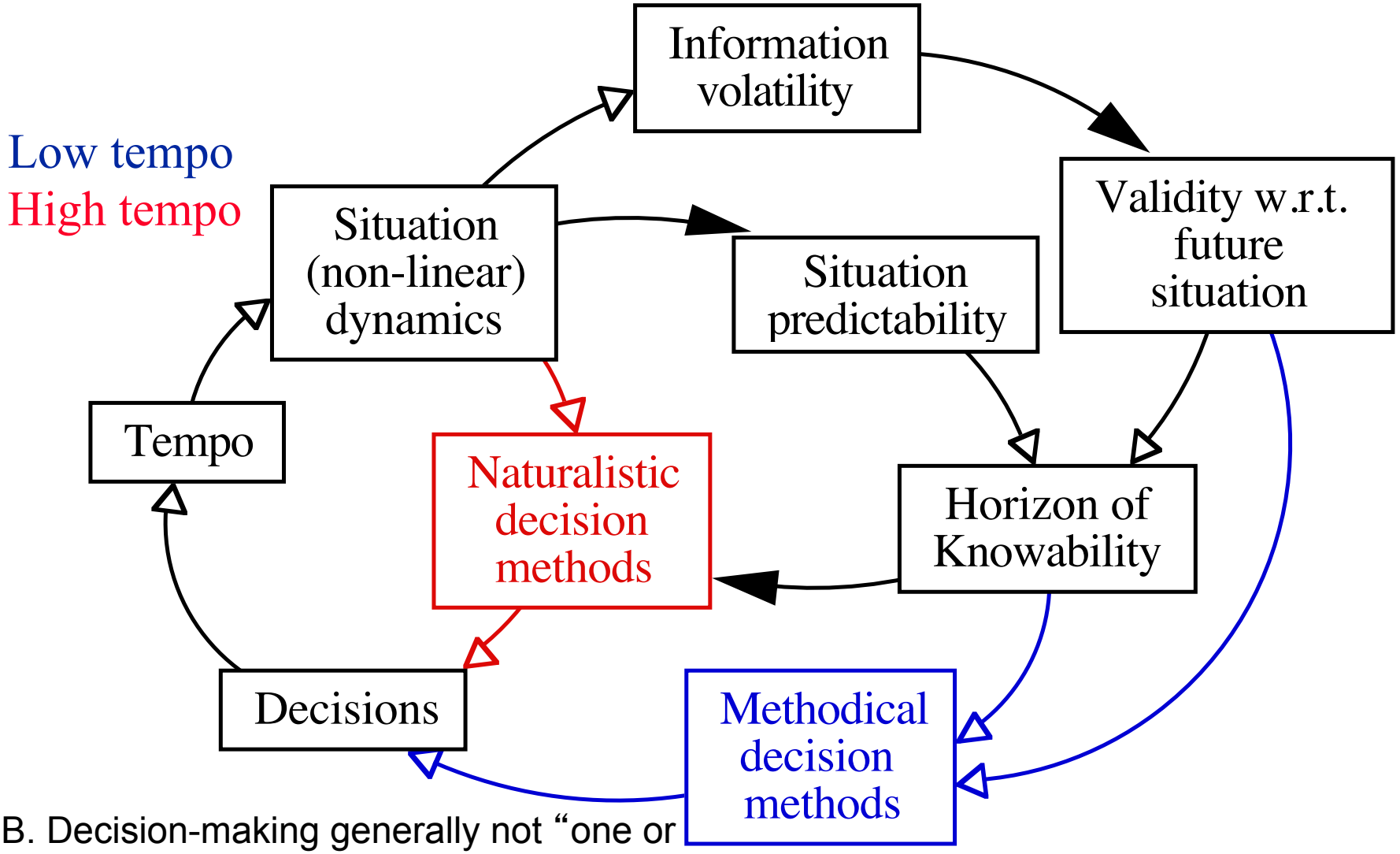
Decision-making – is there a rôle for technology?

A US view…

- “ The enduring C2 function rests on planning, conceptualizing, applying experience, leading, and making sound decisions.
- While information superiority will provide the commander with better and more timely information and sophisticated decision aids and will allow the decision cycle to operate at a higher tempo, C2 will still be about the commander’s judgment, experience, instincts and wisdom.
- These traits will remain of ultimate importance in the battlespace despite advances in technology.”

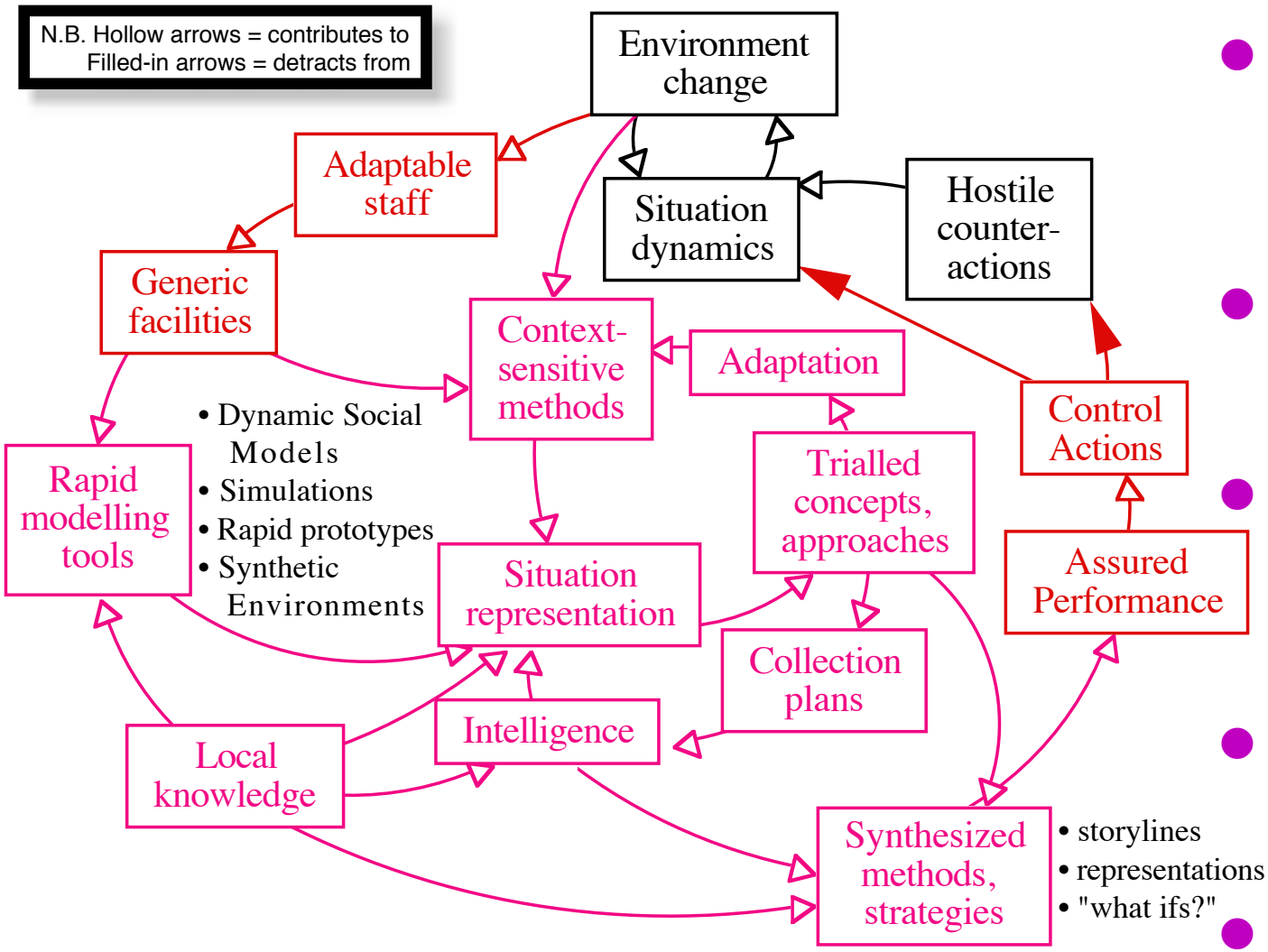
p.66. para. 7-12.
Concept for Future Joint Operations,
Expanding Joint Vision
2010 May 1997

Non-linear Dynamics and Tempo



N.B. Decision-making generally not "one or the other". More likely one or other method will predominate according to tempo without eliminating the other

Synthetic Environments in Operation



- Synthetic environments enable rapid situation prototyping
- Prototypes test context-sensitive methods
- Use local knowledge to validate prototype, resulting strategies & methods
- SE reveals intelligence short falls - collection plans
- Reduced risk, context-sensitive strategies & plans

N.B. Particularly relevant to (e.g.) multi-ethnic Peacekeeping rôles

Conclusion

- C^2 teams develop & evolve on location
  - Process unpredictable—adapts to environment
  - Prescriptive technology inappropriate/ineffective
- C^2 decision-making evolves *in situ*
- Workstation technology/ architecture *does not*
  - Handles vast amounts of data
  - *Overloads* decision-maker—who ignores data or sinks
- There *is* a decisive rôle for technology in C^2
- Immersion SE may prove invaluable…if:—

1. Adaptable to dynamically changing environment
2. Inhabited by real people making real decisions in realistic situations with *understanding of beliefs and behaviours*
3. Validated by current local knowledge e.g. local police
4. ∴ able to anticipate outcome from those real decisions—creates confidence ➔ "good decisions"