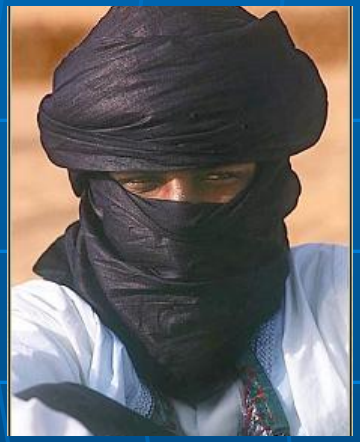
The Neuroscience of Enhancement:

A Framework for Ethical Analysis



By Bill Casebeer, PhD

Overview

- Neuroethics—preliminaries and definitions
- Links to national security…some cases (radicalization)
- Precis of just war theory
- Neuroethics framework: "the three Cs"
- A Normative functional theor
- Ethics and the biologized battlefield
- Potential concerns and rejoinders
- Facts about neuroethics & security in a competitive context
- Some pragmatic considerations
- I am an optimist…you should be too

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Neuroethics Definitions

- Ethics:
  - "Science of norms": an organized body of knowledge about what we ought to do or think, or about what kind of people we ought to be
- Captured by the "big three" moral theories: virtue theory, deontology, utility
  - An agent (virtue theory) doing something (deontology) that has certain effects (utility)
- Three senses: application, epistemic, ontological

Neuroethics & National Security

- Neuroethics: systematic study of how the cognitive neurosciences interact with applied ethics, moral epistemology, and moral ontology to produce innovations in all three fields
- National security…broadest sense: the actions we take individually and collectively to defend ourselves

Case Study: Political Violence & Radicalization

INPUTS

- Resource Scarcity
- Demographic Pressures
- Socio-economic Deprivation
- Organized Crime & Corruption
- Identity Cleavages

CONVERSIONS

Failures of Governance
Identity Mobilization

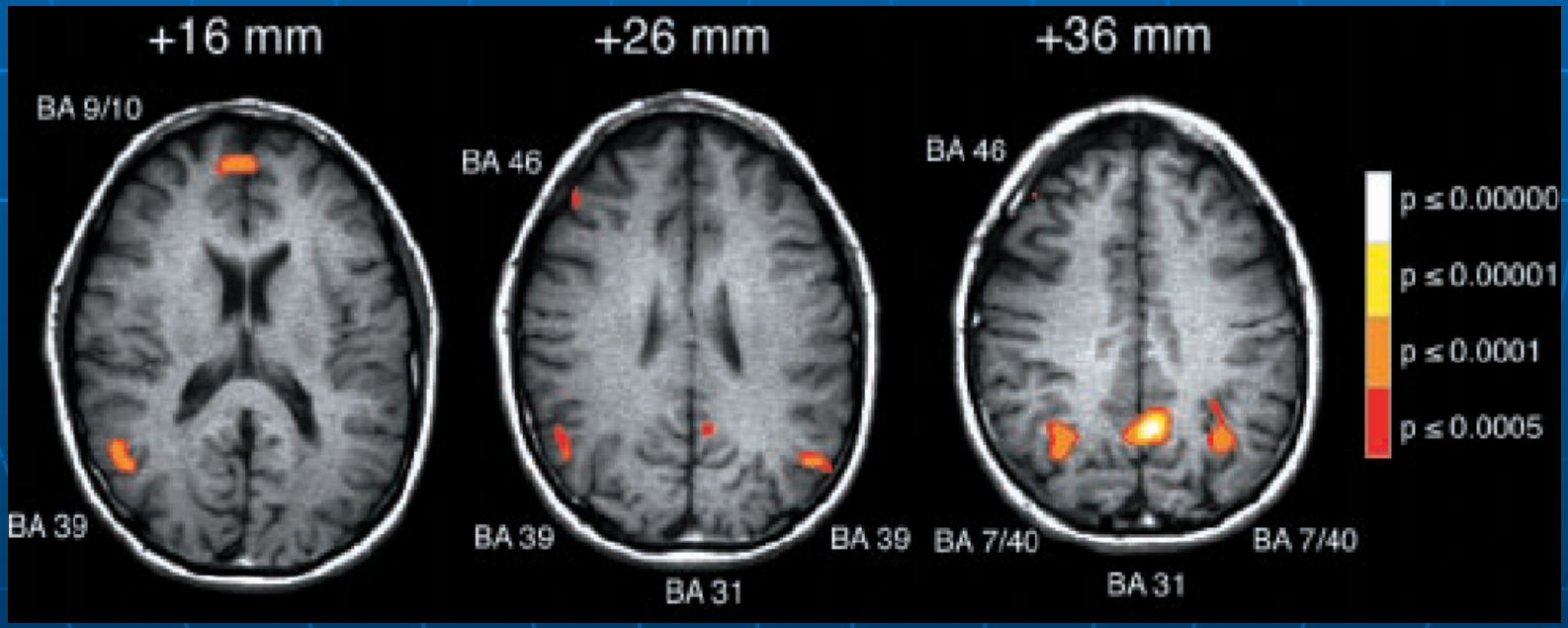
Reinforcing Actions

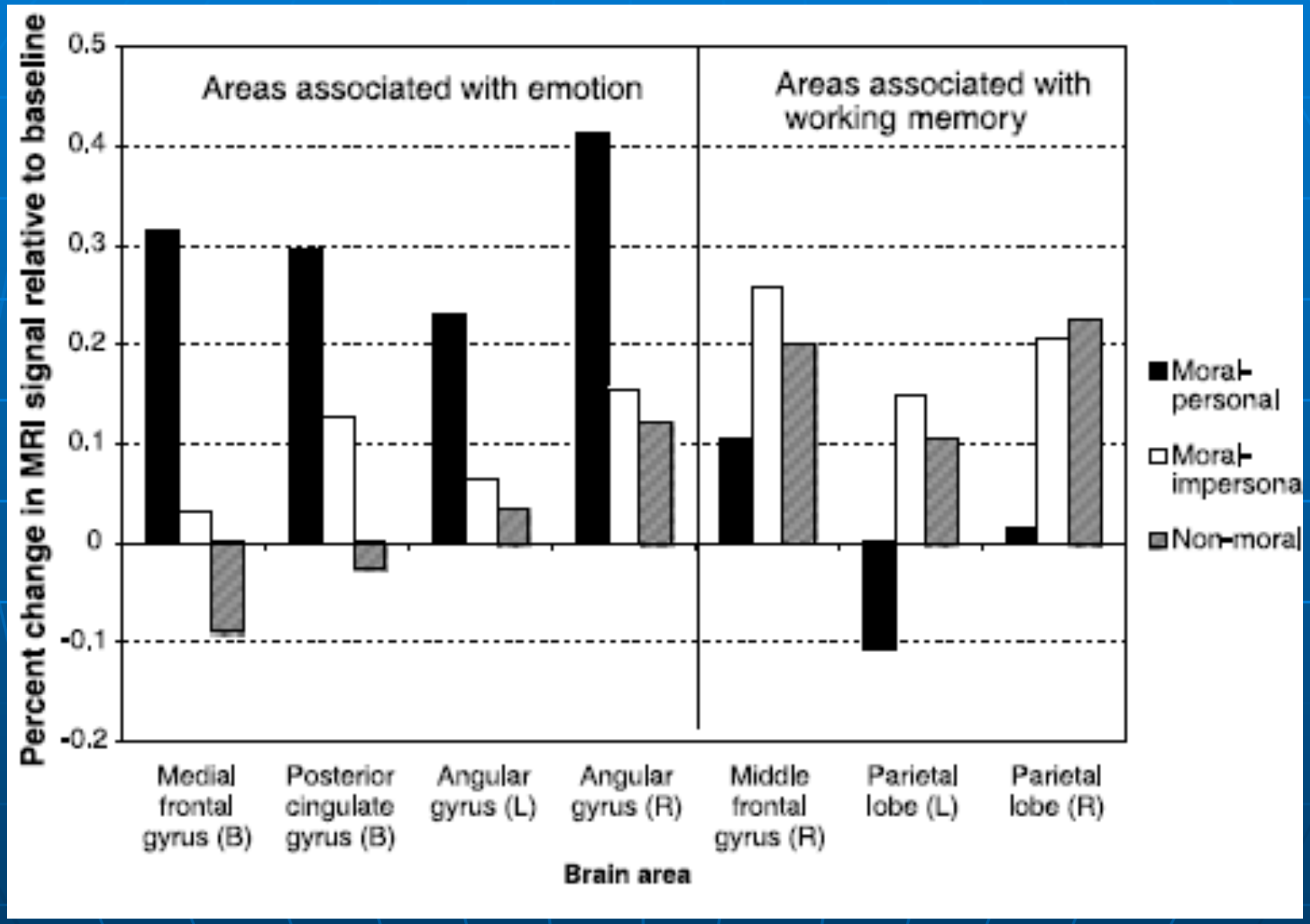
OUTPUTS

- Religious Movements
- Ethnopolitical Groups
- Warlords w/ Militias
- Crime Networks
- Eco-warriors
- Tribes /Clans
- City-States
- Ideological Groups
- Private Security Groups

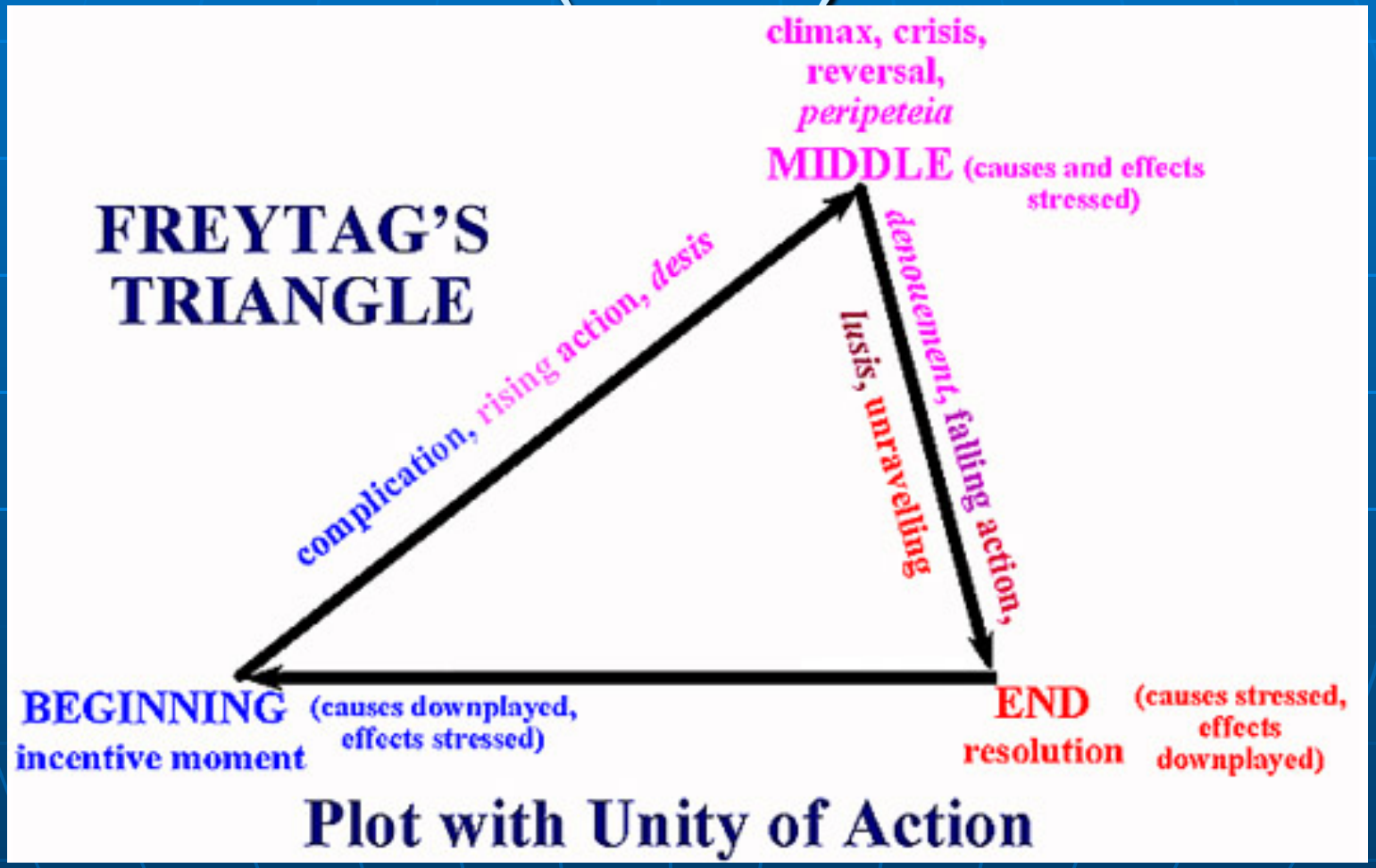
Findings on the Trolley Problem

-Description of experimental setup (Greene et al ’01)
-Findings: personal vs. impersonal setups activate different brain structures (MFC/PCG/AG)




Areas associated with emotion
Areas associated with working memory
Percent change in MRI signal relative to baseline
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
Medial frontal gyrus (B)
Posterior cingulate gyrus (B)
Angular gyrus (L)
Angular gyrus (R)
Middle frontal gyrus (R)
Parietal lobe (L)
Parietal lobe (R)
Brain area
Moral-personal
Moral-impersonal
Non-moral

Gustav Freytag Triangle (1863)



“Surrogate Consciousness” in Mali

Just War Theory

- *Jus ad bellum:* justice of war
  - 1) Just cause
  - 2) Right authority
  - 3) Right intention
  - 4) Proportionality of ends
  - 5) Last resort
  - 6) Reasonable hope of success
  - 7) Aim of peace
- *Jus in bello:* justice in war
  - 1) Proportionality of means
  - 2) Noncombatant protection/immunity
- Generally independent of each other… Walzer's sliding scale

Neuroethics Framework

- Character
  - Does using the technology make us less functional as human beings or develop bad character traits? virtues and vices
- Consent
  - Does the subject of the technology consent (loaded term) to having it used? rights and duties
- Consequence
  - Do the good consequences of using the technology outweigh the bad? greatest happiness principle
- Captures most moral concerns and sometimes provides a tool for resolution…straight regurgitation of the big three moral theories

A Normative Functional Theory

- Enhancement needs a baseline
- A baseline can be established by a good theory of function
- Ahistorical vs. historical (capacity vs. modern-history theory)
- With allowances for functional differentiation (parallel allowances in just war theory)

Ethics & the Biologized Battlefield

- Some differences relative to Napoleonic warfare:
  - 1) problematize the combatant/non-combatant distinction
  - 2) accelerate the OODA-loop for moral decision-making
  - 3) boost chances of unintended consequences
  - 4) complicate "appropriate force" questions
- But, differences in degree, not kind

Concerns & Rejoinders

- Character…national security neuroscience technologies (NSNT) may reduce human flourishing
  - Examples: memory medications/Warwickian disasters
- Consent…may dehumanize us & be used without consent of those affected
  - Examples: neuromarketing/at-a-distance brain manipulation/Burgessian disasters
- Consequence…may boost net pain
  - Examples: unintended consequences of pain management technology/NSNT "gray-goo" disasters

Facts About NSNT Competition

- We already influence each other's neural states…multiple entry points, multiple scales
- Defending against intrusions into autonomy requires understanding of basic mechanisms
- Restraint also presents strategic competitive risks

Optimism

- Proceed with caution, but cleared warm on all three fronts
- Importance of oversight
  - Transparent and democratic (Kitcher)
- No set of choices is without risk!
  - Precautionary principle a poor bet in a competitive security environment
  - Adaptive institutions critical…push judgment/responsibility downwards & outwards…best insulation

DARPA Examples

- See in press Journal of Neuroscience Methods article (available online, 2014)
- Includes:
  - Revolutionizing Prosthetics, REPAIR, REMIND, RE-NET, Accelerated Learning, Narrative Networks, NIA, CT2WS, Low-cost EEG Technologies…BCI-centric

Review

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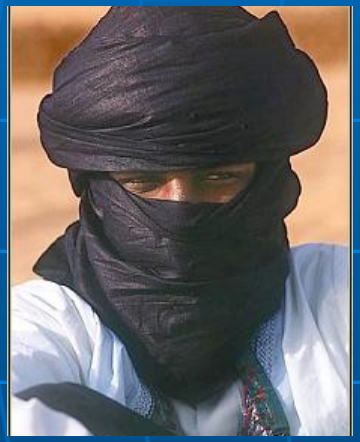

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