

# Representation II

## Strategies for Naturalizing Intentionality

- *Intentionality* refers to the ability of representations to represent something
  - A photograph of a person represents that person
  - A diagram is about a phenomenon or mechanism
  - A noun or verb in a text refers to a thing or its properties
  - A belief represents some putative fact
- Since Brentano introduced the concept of *intentionality* the connection between the representation and what it represents has been mysterious
  - Especially since the represented thing may not exist at all or as represented
- A common strategy has been to appeal to how representations carry information by being causally dependent on what they represent
  - In the case of the brain, this must be mediated by the senses

## But the Senses Don't Work That Way!

- Akins challenges this view of intentionality by focuses on the senses
- She argues that they don't provide the information that we end up representing
- Most naturalists start with the "static perceptual case"--these will provide the anchoring for other representational/intentional states
  - Grounded in what Akins calls the "traditional view" of the senses--the senses provide a window on the world
  - In her exemplar case of thermoreception, our thermoreceptors are viewed as providing information about surface temperature
    - They are thought to function like thermometers

## Traditional View of Sensory Representations

- The brain only accesses the world via representations provided by the senses
  - Without them, the brain is a solipsist
- 1. There is a reliable correlation between what is represented and the representation
- 2. The structure of the phenomenon represented (relations between different temperatures) is preserved in the representations
- 3. The senses offer *servile* reports--they do not impose their own interpretation
- This does not require that the senses function perfectly, but error should not be widespread
  - For only if sensory representations satisfy these conditions will the brain acquire the information needed to operation in the world
    - And avoid solipsism

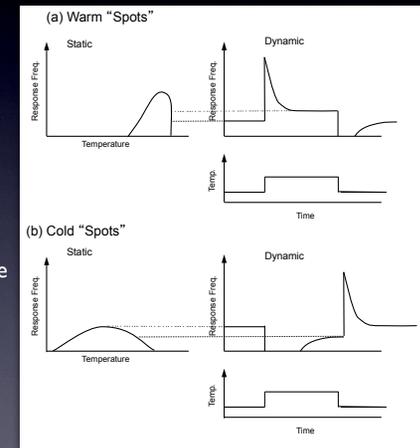
# Narcissistic Sensory Systems

- Narcissist over attend to themselves
- Interpret everything in terms of its significance to oneself
- Narcissism with respect to thermoreception
  - Receptors are not in the business of objectively reporting whats in the world, but their own response to it
  - Two temperature receptors, one for warm and another for cold
  - Two pain receptors for extreme hot and cold
  - Different parts of the body have different concentrations of warm and cold receptors and so are more sensitive to one or the other



# Warm and Cold Receptors

- The “static” function of the warm and cold spots is its response frequency at different temperatures
- The non-linear relations shown on the left
- Also have a “dynamic” responses to changes in temperature
  - For the warm spot
    - When the temperature increases, the response first spikes, then gradually drops back to the new static response
    - When the temperature drops, the response drops before gradually returning to the new static response
    - Size of spike depends on size of change
  - Reverse for the cold spots



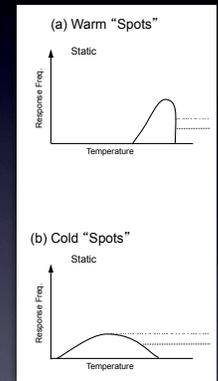
# Reports Temperature as it Matters to the Organism

- The organism is narcissistic: what it needs to know is not how the world is, but how the world is affecting it
- Hot and cold receptors are reporting changes in temperature that might matter
- What matters most is how things are changing
- If temperature is changing differently for different parts of the body, they report the same stimulus differently
  - Hand initially in warm water reports tepid water as colder than hand initially in cold water



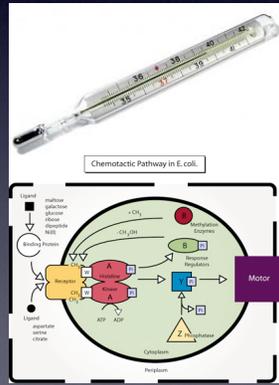
# From the Traditional View

- Thermoreception is a poor sensory system if what it is supposed to do is provide accurate information about temperature
  - It reports the same temperature in different ways
    - Depending on how many receptors are in a given tissue
  - It gives the same response to different temperatures
    - To stimuli on either side of the maximal response



## Evolutionarily Sensible

- “one realizes that this system is not merely inept, a defective indicator of surface temperature. Rather, the system as a whole constitutes one solution to man’s various thermal needs--that he be warned when thermal damage is occurring or before it is likely to occur, when temperature changes are likely to have specific consequences, and so on.”
- Would an objectively accurate recording of temperature work better?
  - In order to use such information to plan action, the organism would need to know how to reason with that information
- For many purposes, what the motor system needs to know about is what matters for action
  - For a bacterium, is it moving up or down a chemical gradient



## Processing Information and Representation

- Akins emphasizes the various types of information organisms must acquire in order to direct motor activity
  - Why do the neural processes involved in processing this information not count as representations?
- At some points Akins seems to acknowledge that they do:
  - “Even our simplest actions, then, involve numerous sources and types of information (here, visual, proprioceptive, and haptic information) and, within a single system such as vision, specialized information (about shape, position using a variety of reference frames, rotation, movement, and so on) which requires diverse **representational schemes**.”
- Her objection seems not to be to the occurrence of representations in the brain, but to the nature of those representations
  - They don’t represent objective features of the external world
    - Rather, they represent narcissistic information
- But elsewhere she speaks of such as “nonrepresentational systems”

## Intentional Representations of which we are Conscious

- Akins real concern seems to be with the intentional grounding of our conscious representational states
  - Her contention is that sensory receptors don’t ground these states
- But how do we come to have such states?
  - A plausible answer is that we extract it from what is represented by the senses
  - But Akins rejects this answer: “This suggestion, however, amounts to little more than an expression of one’s faith in the traditional view. Empirically, there is little reason to think that all sensory systems carry within them the means to “decode” their own responses.”
- But why think we do represent consciously all information acquired by our senses?
  - We may not be able to make objective claims about temperature
  - But with other systems, such as vision, we do reach more objective representations of the world outside us--tables, chairs
    - Of course this requires a lot of neural processing

## Akins’ Doubts about the Detector Theory

- Akins raises a further objection to the construal of sensory systems as detectors of specific properties (including narcissistic ones)
  - Internal systems in the organism regularly modify the response properties of the senses so that they are not fixed detectors of a given property
    - Example: feedback processes alter the response of muscle spindles to changes in muscle length as the muscle is extended or contracted
- What is wrong with context sensitive detectors--detectors whose sensitivity is calibrated by other activities in the system?
  - Of course whatever utilizes the response of the detector must also be responsive to the way the receptor was calibrated

# Stufflebeam: Real vs. As-if Representations

- Anything can be treated as a representation
- But real representations represent intrinsically
  - They must “bear content independent of our (or some other agent’s) descriptions or interpretations, their ontological status as content-bearers must not waver over time, and they must be the sorts of things that would not exist save as content-bearers.”
  - “an intrinsic representation must be ontologically dependent on being a bearer of content”
- Photos represent intrinsically—“all photos have the property of bearing content for as long as they exist”
  - “they simply would not be photos if they were not ontologically dependent on being in a stands-for relation to whatever they depict”
  - Why is this the case: They were produced by a process whose designed function was to produce content-bearers
- Brain processes are not produced by processes whose function is to produce content-bearers

