Empathy

the ability to understand and share the feelings of others
Overview

- Heightened Empathy (Dylan at Newport)
- The Politics of Empathy (Tutu, Obama)
- Emotion
- The Circuitry of Empathy
“Chimes of Freedom”
Newport Folk Festival in 1964

May be the best recording of Bob Dylan ever captured on film. He is singing this biblical-like anthem for the underserved –
“An’ for each unharmful, gentle soul misplaced inside a jail/
An’ we gazed upon the chimes of freedom flashing.”

One year later at Newport, Dylan is booed for playing electric music, and this experience forever changes the way that he interacts with the public.
“Chimes of Freedom” by Bob Dylan

“Far between sundown's finish an' midnight's broken toll
We ducked inside the doorway, thunder crashing
As majestic bells of bolts struck shadows in the sounds
Seeming to be the chimes of freedom flashing
Flashing for the warriors whose strength is not to fight
Flashing for the refugees on the unarmed road of flight
An' for each an' ev'ry underdog soldier in the night
An' we gazed upon the chimes of freedom flashing…

Even though a cloud's white curtain in a far-off corner flared
An' the hypnotic splattered mist was slowly lifting
Electric light still struck like arrows, fired but for the ones
Condemned to drift or else be kept from drifting
Tolling for the searching ones, on their speechless, seeking trail

For the lonesome-hearted lovers with too personal a tale
An' for each unharmful, gentle soul misplaced inside a jail
An' we gazed upon the chimes of freedom flashing
Starry-eyed an' laughing as I recall when we were caught
Trapped by no track of hours for they hanged suspended
As we listened one last time an' we watched with one last look
Spellbound an' swallowed 'til the tolling ended
Tolling for the aching whose wounds cannot be nursed
For the countless confused, accused, misused, strung-out ones an' worse
An' for every hung-up person in the whole wide universe
An' we gazed upon the chimes of freedom flashing
Desmond Tutu

“A person with Ubuntu is open and available to others, affirming of others, does not feel threatened that others are able and good, based from a proper self-assurance that comes from knowing that he or she belongs in a greater whole and is diminished when others are humiliated or diminished, when others are tortured or oppressed.”

– Desmond Tutu
Barack Obama

“The biggest deficit that we have in our society and in the world right now is an empathy deficit. We are in great need of people being able to stand in somebody else's shoes and see the world through their eyes.”

– Barack Obama
Blueprints (Doris Lessing)

- We are diverse based upon our genetics, epigenetics and experiences (culture)
- We have a genetic blueprint with multiple possible outcomes,
- “We must strive to achieve our beautiful impossible blueprints”
- A responsible artist should be “an architect of the soul,” a humanist working to strengthen good against evil
- Empathy is at the core of good
What Are Emotions?

- Short-lived Phenomena
  - Psychological
    - Alter attention, shift certain behaviors upward in response hierarchies, activate memory networks
  - Physiological
    - Rapidly organize the responses of disparate biological systems (e.g., facial expression, somatic muscular tonus, voice, ANS)

Levenson, 1994
Emotions Shape Our Responses to Diverse Homeostatic Demands

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Courtesy of Virginia Sturm
Emotional Systems Preserved in Healthy Aging

Seeley, 2007
What is Empathy?

Prosocial Behavior
- Affiliation
- Compassion

Emotional Contagion
- Facial Mimicry
- Autonomic Reactivity

Cognitive Empathy
- Emotion Recognition
- Perspective-Taking

Perception
- Detection of Socioemotional Stimuli

Courtesy of Virginia Sturm
Emotional Empathy is Affect-Sharing

Mirroring of others’ emotions
- Mimicry
- Autonomic simulation
- Rapidly
- Without conscious awareness

Evolutionarily conserved
- Present in other species
- Present in human infants

Depends on emotion generation brain systems
- Insula, ACC → central amygdala, hypothalamus → PAG

Photo credit: Mancini, 2013
Emotional Contagion Promotes Prosocial Behavior

consolation

Plotnik & deWaal, 2014

deWaal & Suchak, 2010

Douglas et al., 2006

Kuczaj et al., 2015

helping

deWaal, 2007

Courtesy of Virginia Sturm
**Sympathetic Autonomic Nervous System**

- Salience detection
- Higher autonomic arousal
  - Faster heart rate
  - Faster respiration
  - Higher skin conductance level

**Parasympathetic Autonomic Nervous System**

- Social communication
- Lower autonomic arousal
  - Slower heart rate
  - Slower respiration
  - Higher heart rate variability

Courtesy of Virginia Sturm
Parasympathetic Activity Fosters Socioemotional Behavior

Higher heart rate variability is associated with:

- Social engagement
- Empathy
- Emotion regulation
- Positive emotion
- Prosocial behavior
- Optimism and agreeableness

“Be kind whenever possible. It is always possible.”
- Dalai Lama
3 Types Frontotemporal Dementia

Behavioral Variant
- Often genetic
- Tau, TDP, FUS
- ⅔ TDP

Language Variants
- Semantic Variant
  - Rarely genetic
  - 83% TDP-C
- Nonfluent Variant
  - Some genetic
  - 85% Tau, TDP-A
Facial Mimicry Alterations in bvFTD and AD

Proportion of Positive Facial Behavior

- Enthusiasm
- Calm
- Affection
- Amusement

Covariates: sex, age, education

*p < .05

Courtesy of Virginia Sturm
Recognition of Negative Emotions is Impaired in bvFTD

- Patients with bvFTD are poor at recognizing negative emotions
- Preservation of positive emotion recognition?

Rosen et al., 2002; Rankin et al., 2006
Baseline Autonomic Deficits in bvFTD

covariates: sex, age, education

* p< .05

sympathetic deficits
failure to respond to salient environmental cues and upregulate physiological arousal

parasympathetic deficits
failure to slow the heart and downregulate physiological arousal
Emotional Deficits in FTD

- Lack of concern for loved one’s illness
- Cruelty to children, animals, elderly
- Lack of concern when others are sad
- Rude comments to others
- Lose respect for intrapersonal space
- “Disgusting” behaviors
- Diminished response to pain
Relationships in Art

The couple does not quite look emotionally connected to one another and shows flat facial expressions. This art is produced by the patient in the video who has degeneration of the right temporal lobe.
Semantic Dementia Couples

Couples appear remote to each other despite the patient’s effort to show connection.

He also has a deficit in emotion recognition demonstrated in laboratory testing.
Semantic Dementia Faces

The patient paints the dog as aggressive – remarkable considering his aggression toward his own dog.
Loss of Empathy

A primarily right frontotemporal network of brain regions is involved in emotion processing.

Right anterior temporal and medial frontal regions essential for real-life empathic behavior:

- R temporal pole
- R medial orbitofrontal cortex (OFC)
- R caudate
- R medial frontal

*Only* the right hemisphere mediates empathy change in these patients.

Rankin et al. 2006
Laboratory Measurement of Emotion

Physiological Reactivity
Heart rate, respiration depth, respiration rate, skin conductance, finger temperature, finger pulse, heart rate variability, cardiac impedance, facial EMG, pupil diameter

Facial Behavior

Self-Report

| Did you feel sad while watching the film? |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| No | A little | A lot |
Recognition All Types Emotion Impaired bvFTD

Emotion Recognition (Proportion Correct)

Goodkind, Sturm, Ascher, Shdo, Miller, Rankin & Levenson, 2015
Prosocial Giving Impaired bvFTD

- bvFTD give less to experimenter than controls although it costs nothing to give
- Lower prosocial giving, atrophy right pulvinar nucleus thalamus
Prosocial Helping Task

experimenter drops key here

participant sits here
Prosocial Behavior Impaired bvFTD Enhanced AD

- Disengagement: staring off into space, looking annoyed/bored/fidgety
- Concern: leaning forward in chair, looking for helping object, moving chair toward experimenter

![Graph showing mean helping scores for Disengagement and Concern across bvFTD, HC, and AD groups. Asterisks indicate statistical significance at p < .05.](chart.png)
Conclusions

- Disruption of emotional circuitry disrupts behavior
- We are just beginning to grapple with society & and the brain
- Neuroscience, religion, personal ethics collide and intersect
- Outliers help to understand the mean
- Propagation of empathy needed for survival of this planet