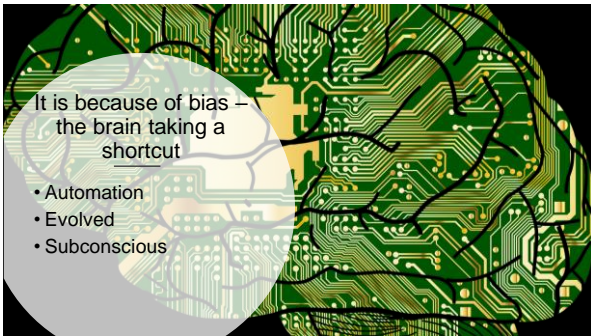
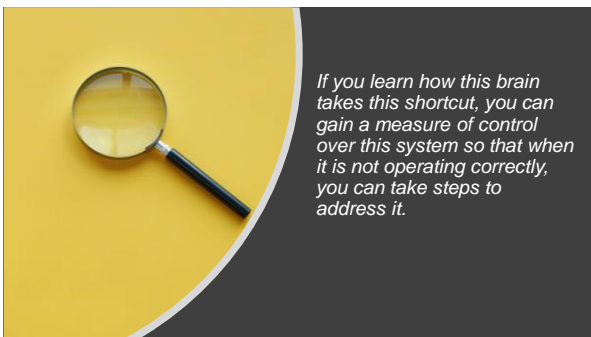




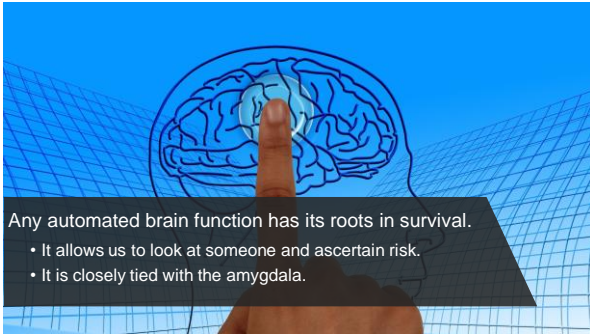
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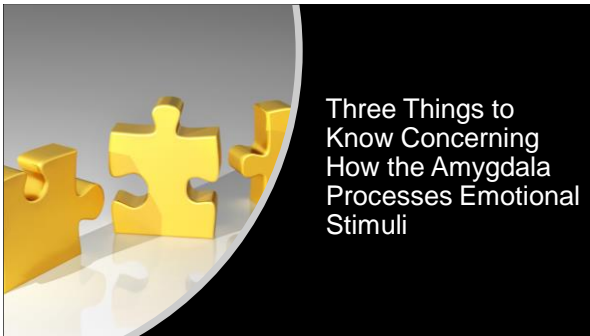
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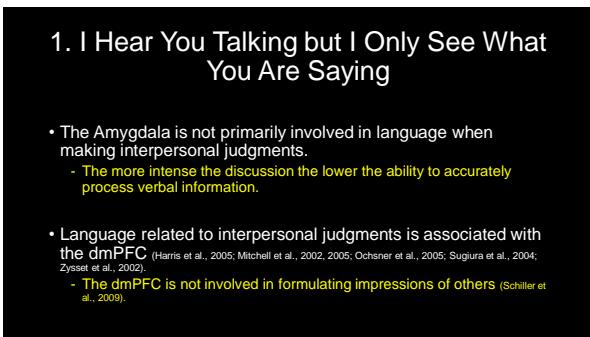
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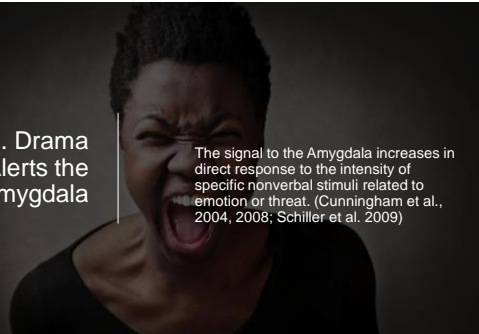
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6



7



2. Drama Alerts the Amygdala

The signal to the Amygdala increases in direct response to the intensity of specific nonverbal stimuli related to emotion or threat. (Cunningham et al., 2004, 2008; Schiller et al. 2009)


8



3. There is Always Conscious and Subconscious Monitoring

- The amygdala is always processing all emotional nonverbal cues you encounter.
 - Some conscious
 - Some subconscious
 - The chemical impact is the same whether the amygdala monitoring leads to conscious or subconscious awareness.
- The amygdala is processing nonverbal stimuli
 - Independently from attentional resources or awareness
 - Implicitly and automatically
 - (Engel et al., 2007; Phelps and LeDoux, 2005; Phelps et al., 2000; Todorov and Engel, 2008; Winston et al., 2002)

9



For all nonverbal emotional cues, we have evolved to have a pre-attentional visual system.

50 to 200 milliseconds (before our conscious brain can register) our eyes automatically

- Sees
- Brains react

Even peripherally

- Participants detected and reacted to nonverbal emotions cues 15 or 30 degrees to our right or left.
- Smith FW, Rossit S (2018) Identifying and detecting facial expressions of emotion in peripheral vision. PLoS ONE 13(5): e0197160. <https://doi.org/10.1371/journal.pone.0197160>

10

Females Possess a Subtle Advantage in Processing Emotional Expressions to Males.

- Small but reliable
- We think it is more significant because behavioral response patterns are different


- (McClure, 2000)



12

We Are Emotionally Impacting Each Other

Conscious & Subconscious



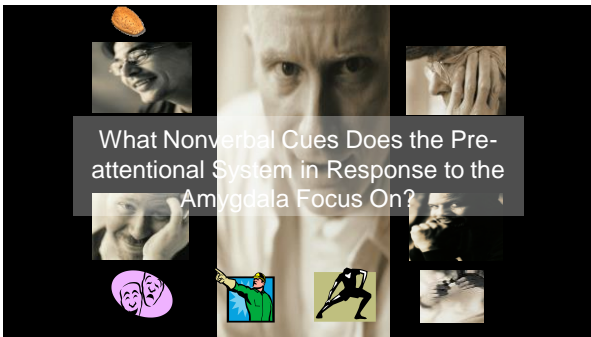
Quality & Quantity

Influencing your chemistry

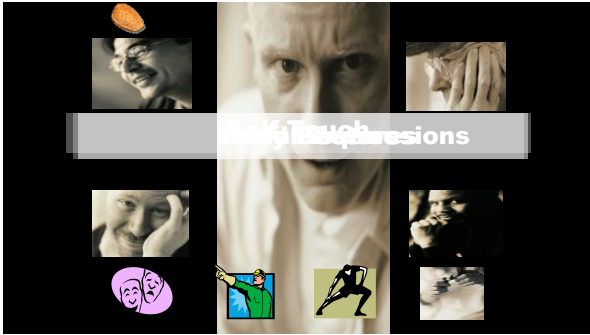
- Which impacts
 - Emotional condition
 - Cognitive state
 - Physical wellbeing

13

What Nonverbal Cues Does the Pre-attentive System in Response to the Amygdala Focus On?



14



15



16

Age Chart – Facial Discrimination

- By age 1
 - The ability to accurately label emotions (Gross & Ballif, 1991)
- Between 9 and 10 years
 - Prominent improvements in accuracy
- Between 13 and 14 years
 - Additional jump in accuracy and response (Kolb, Wilson, & Taylor, 1992)
- Adult (20 to 39)
 - Transition to discrimination and response peak
- Older adult (50 to 64)
 - A drop in emotional expression
 - Experience less negative affect (Carstensen, Passafiumi, Mayr, & Nesselroade, 2000; Charles, Reynolds, & Gatz, 2001; Paulsen et al., 2008)
 - Fewer outward displays of emotion (Magai, Cosedine, Kivshchikova, Kudachio-Gyamfi, & McPherson, 2006; Phillips, Henry, Korte & Miller, 2009)
 - Decreased magnitude of emotional memory (Charles, Mather, & Carstensen, 2003)
 - Threat detection processes intact (Mather & Knight, 2006)
- 65 and older
 - Facial expression recognition deficits towards threat detection processes (Burke & Mackay, 1997)

23



24

Hand Gestures

- The limbic system takes control of hands quicker and more directly than any part of the body.
- **Subconscious interpretation of truth**
- **First formal language in infants and in history**
 - Improves infant language acquisition (*Goodwyn, Acredolo, and Brown 2000*)
 - Improves the number of verbal commands that a dog can learn

34

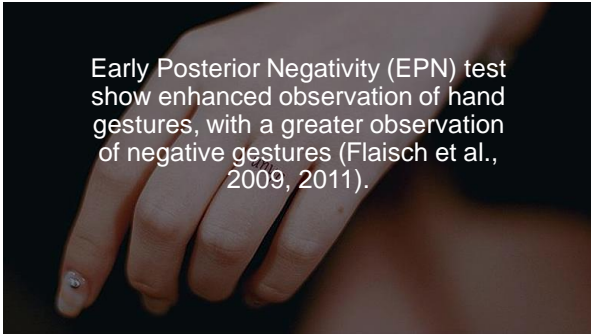
8 Most Common Lying Gestures

Higher the Emotion

More Significant the Cues

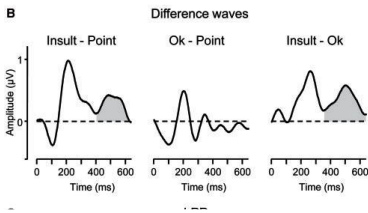
1. Mouth Cover 2. Nose Touch 3. Nose Itch 4. Eye Rub
5. Ear Grab 6. Neck Scratch 7. Collar Pull 8. Finger-in-the-Mouth

35



36

Monitoring of Hand Gestures from 200 to 700ms



37

Positive Gestures and Productivity

Especially if There is Good Rapport

- Gesturing reduce the load on working memory (cf. Marstaller and Burianová, 2013) and cognitive load in general (Pouw et al., 2014).
 - Better memory and comprehension
- The higher the empathy the more effective gestures are on conveying meaning in language, (Chu et al. 2014)
 - Communication between workers is improved by empathy
 - Less communication errors

39

Body Movement & Posture

Dramatic movements are sustained by

- Sustained body posture for seconds, a body posture
- Mimicking provides emotional rapport
- Mimicking body posture is a method to build rapport




41

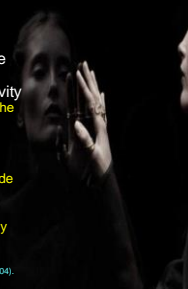
<https://www.youtube.com/watch?v=Hruf1p3ke7U&t=184s>
first 2:34



42


Mirror Neurons

- Mirror neurons provide a neural mechanism by which the actions and intentions of others can be automatically understood.
- Children with autism show no mirror neuron activity
 - A dysfunctional 'mirror neuron system' may underlie the social deficits.
- Process
 - Mirror neuron system – matches the movements of others
 - Limbic system – produces chemical signals which code responses
 - The insula - acts as an interface between the mirror neuron system and the limbic system in order to translate what is observed or imitated into its internally felt emotional significance.
 - Rizzolatti, G. & Craighero, L. Annu. Rev. Neurosci. 27, 169–192 (2004).
 - Cairn, L. et al. Proc. Natl. Acad. Sci. USA 100, 5497–5502 (2003).
 - Leslie, K.R., Johnson-Frey, S.H. & Grafton, S.T. Neuroimage 21, 601–607 (2004).



43

An Evolutionary Link Between Gestural Body Movement and Language




- National Academy of Sciences found that blind individuals produce many of the same emotional movements and gestures
 - Could not have been learned
- The product of the limbic system
 - Why it is so easily produced and interpreted
 - (Hewes et al., 1973; Harnad et al., 1976; Rizzolatti and Arbib, 1998; Corballis, 2003)

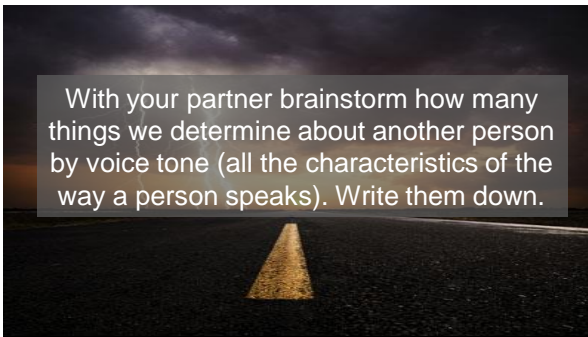
44

Mirror Neuron Circuits Play Two Role in Adaptive Behavior

1. Support fast learning (Gallese, 2003)
 - Pattern behaviors are highly influential
 - We are repeating it over and over again
 - Learning
 - Chemistry
2. Responsible for social empathy and cooperation (Decety & Chaminade, 2003; Hatfield, Cacioppo, & Rapson, 1992)
 - A deeper understanding of another
 - Modifying our behavior to be a member of the team
 - (Rizzolatti, Fadiga, Fogassi, & Gallese, 2002; also see Chao & Martin, 2000)



45



With your partner brainstorm how many things we determine about another person by voice tone (all the characteristics of the way a person speaks). Write them down.

49

1. Age	19. Happy
2. Gender	20. Fearful
3. Race	21. Apprehensive
4. Language	22. Stressed
5. Culture	23. Sexy
6. Sick	24. Serious
7. Size	25. Authoritative
8. Powerful	26. Condescending
9. Strong	27. Submissive
10. Weak	28. Obnoxious
11. Dying	29. Annoyed
12. Tired	30. Irritated
13. Familiar person	31. Disgusted
14. Angry	32. Goofy
15. Calm	33. Hated/rushed
16. Anxious	34. Surprised
17. Excited	35. Disappointed
18. Sad	36. Uninterested

50



51

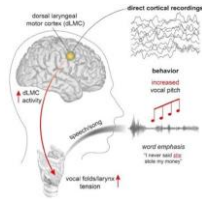
You Hear Emotion Before You Process Words

- 150 to 200 ms – emotional tones
 - Amygdala activation to positive and negative vocalizations compared to neutral ones (Fecteau, Belin, Gosselin, & Armony, 2007)
- Around 300 ms - identity match (who, gender, age, health, race...)
 - Paralinguistic features encoding different pieces of information about a speaker
 - Superior temporal gyrus
 - Max Planck Institute "Where Voice Recognition Occurs in the Brain" NeuroscienceNews, NeuroscienceNews, 27 December 2017.
- After emotions and identifiers – word recognition
 - Sprengelmeyer, K. N., Kutas, M., Urbach, T., Altenmüller, E., and Münte, T. F. (2003). Neural processing of vocal emotion and identity. Brain Cogn. 69, 121–126. doi: 10.1016/j.bandc.2005.06.003

52

Your Tone of Voice Is Controlled by Your Brain

- Chang and his colleagues found that the bilateral dorsal laryngeal motor cortex (dLMC), signals voice tones.
- They could evoke movement of the muscles in the larynx with small electrical currents to the dLMC.
- The input to the dLMC come from the cortex when calm and from amygdala when aroused.



53

Tone Carries Meaning

- By changing the pitch and word emphasis attempt to convey the following phrase in as many ways.
- For example, in one tone it could be an accusation and in another a query.
- "I never said she stole my money"



54

So as You Think You Do You Are Speaking but Your Lip Aren't Moving

- When you engage in inner speech the same mechanism of outer speech are all engaged - 'as a kind of action'.
 - Inner speech sends electrical signals that tell the mouth, tongue, and lips to move and talk.
- A clear example of how empathy can trigger the same chemical experience in the observer to a lesser extent because the body mimics in the same exact physical process.



What You Say to Yourself Impacts Your Biology

- Sadness
- Depression
- Anger

Repeat a Different Message

• Whitford TJ, Jack BN, Pearson D, Griffiths O, Luque D, Harris AWF, Spenser KM, Le Pelley ME. (2017). Neurophysiological evidence of efference copies to inner speech. *eLife*, 6, e28197. <https://elifesciences.org/articles/28197>

56

The Many Levels of Bias

- Personal biases – taught or a product of experiences
- Environmental – created by patterns in the environment
- Societal – the shared majority opinion

58



Bias

Personal

59

Infants Attend More to Information Perceived Negatively (Mastropieri & Turkewitz, 1999)



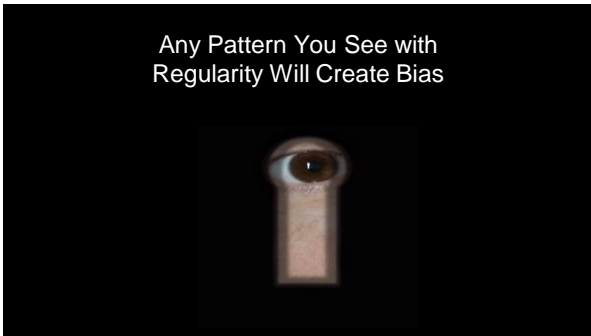
How does this impact daily life:

- Infants around age 1 in new situations, use the perceptions of others to form their own.
 - Infants consistently were influenced by the negative response of maternal figure than the positive (Mumme, Fernald, and Herrera 1996).

60



61



62

Bias Study


Ann Arbor Public Schools			
Interviewed	Staff 283	Students 279	Parents 130
Total	692		

- Disproportionate patterns create bias

63

Example

- Disproportionate patterns create bias
 - Good students/Bad students (Asian factor - 13% student population)



64



Bias


Societal

65

Bias

Persistent disproportionate patterns in society create bias

- Society (most familiar)
 - Race
 - Culture
 - Gender



66

Hard to Live Within This Culture & Not Develop Bias in Relation to Black Males

Messages are constant

- Internet
- TV
- Radio
- Newspapers
- Conversations



67

Harvard Bias Study

- Found that regardless of race or gender most Americans associate black males to crime and violence today (Levin & Banaji 2006; Dunham & Banaji, 2006; Baron & Banaji, 2006; Kalis, Banaji, & Kosslyn, 2008; Sabin, Nosek, Greenwald, & Rivara, 2009; Stanley, Sokol-Hessner, Banaji, & Phelps, 2011; Cunningham, et al. 2004; Mazzocco, et al. 2006; Green, et al. 2007).

68

Findings

69

Study

- They played word association
- Faces flash on the screen in 30 milliseconds
- What word comes to mind?
 - Crime
 - Anger
 - Violence

70

Study

- Whites were shown faces
 - 30 milliseconds
 - Too quickly for them to notice them
- Yet black faces still triggered activity in the amygdala
- When the pictures slowed - for a half a second
- Black faces caused heightened activity in the prefrontal cortex indicating internal conflict.
 - What they were feeling and what they believed were in conflict

Wii A. Cunningham 2004

It is not surprising - watch TV, listen to the radio, read a newspaper and one cannot escape the association of black males to crime, violence, and danger.

71

Amygdala Response

- It is the amygdala that inspired the first investigations to race and mental processing.
- Amygdala processes emotions
 - The history of race relations in the US, especially black-white relations, is fraught with complex emotions, including fear, hostility and lack of trust.

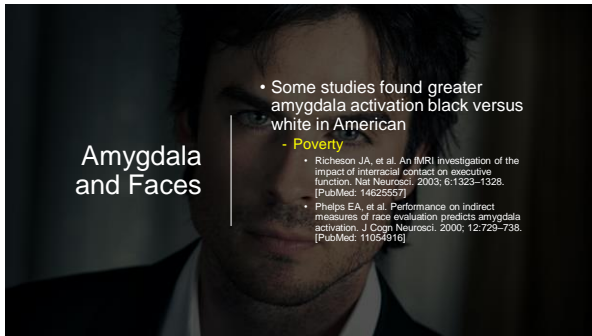
72



Amygdala and Faces

- Numerous studies have found greater amygdala activity to outgroup race faces than to ingroup faces.
 - Shenk DA, et al. Race and executive processes mediate group interdependence. *Vibrances: the neural correlates of trust decisions*. *Phil Trans R Soc Lond B*. 2012; 367:744-753. [PubMed: 22271798]
 - Hart AJ, et al. Differential response in the human amygdala to racial outgroup versus ingroup faces stimuli. *Neuroreport*. 2000; 11:2301-2305. [PubMed: 10943864]
 - Richeson JA, et al. An fMRI investigation of the impact of interracial contact on executive function. *Nat Neurosci*. 2003; 6:1323-1328. [PubMed: 14625557]
 - Cunningham WA, et al. Separable neural components in the processing of black and white faces. *Psychol Sci*. 2004; 15:802-813. [PubMed: 15913331]
 - Whalen MJ, Tsoi JT. Controlling facial expression: social-cognitive goals affect amygdala and decoupling attention. *Psychol Sci*. 2009; 18:56-63. [PubMed: 19282662]
 - Reynolds J, et al. The effects of skin tone on race-related amygdala activity: an fMRI investigation. *Soc Cogn Affect Neurosci*. 2007; 2:39-44. [PubMed: 18095117]
 - Richeson JA, Tsoi JT, Tsvetkov S, Baird AA. Eye-gaze direction modulates race-related amygdala activity. *Group Process Intergroup Relat*. 2009; 11:223-240.
 - Kiri JJ, Paull SM. Ingroup and out-group membership reactions predict amygdala activation to social exclusion. *Front Econ Neurosci*. 2009; 1:1. [PubMed: 19591949]
 - Fichten CD, Cox CL, Strimling T, Ryan L. Negative stereotype activation alters interaction between neural correlates of arousal, inhibition and cognitive control. *Soc Cogn Affect Neurosci*. Sep 27 2011 published online. 10.1093/acn/wnr052

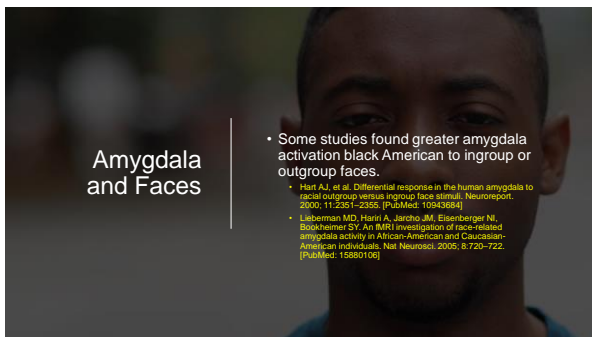
73



Amygdala and Faces

- Some studies found greater amygdala activation black versus white in American
 - **Poverty**
 - Richeson JA, et al. An fMRI investigation of the impact of interracial contact on executive function. *Nat Neurosci*. 2003; 6:1323-1328. [PubMed: 14625557]
 - Phelps EA, et al. Performance on indirect measures of race evaluation predicts amygdala activation. *J Cogn Neurosci*. 2000; 12:729-738. [PubMed: 11054916]

74



Amygdala and Faces

- Some studies found greater amygdala activation black American to ingroup or outgroup faces.
 - Hart AJ, et al. Differential response in the human amygdala to racial outgroup versus ingroup faces stimuli. *Neuroreport*. 2000; 11:2301-2305. [PubMed: 10943864]
 - Lieberman MD, Haini A, Jarcho JM, Eisenberger NI, Bookheimer SY. An fMRI investigation of race-related amygdala activity in African-American and Caucasian-American individuals. *Nat Neurosci*. 2005; 8:720-722. [PubMed: 15591169]

75

Societal Bias Does Not Discriminate

“There is nothing more painful to me at this stage in my life than to walk down the street and hear footsteps and start thinking about robbery then look around and see somebody white and feel relieved.”
Jesse Jackson

76

Let's Face It

• Fusiform Face Area (FFA) is activated when we distinguish faces.



77

More Accurately Recognize Ingroup Members

- Research shows that individuals are faster and more accurate at recognizing faces of ingroup members (same race) than outgroup members (other-race).
 - Malpass RS, Kravitz J. Recognition for faces of own and other race. *J Pers Soc Psychol.* 1969; 13:330-334. [PubMed: 5359231]
 - Brigham JC, Malpass RS. The role of experience and contact in the recognition of faces of own and other-race persons. *J Soc Issues.* 1985; 41:139-155.
- Participants exhibit greater FFA activation when viewing same-race faces compared with other-race faces.
 - **Correlates with the memory advantage for same-race faces.**
 - Caldara R, et al. Face versus non-face object perception and the "other-race" effect: a spatiotemporal event-related potential study. *Clin Neurophysiol.* 2003; 114:515-528. [PubMed: 12706452]
 - Ito TA, Thompson E, Cacioppo JT. Tracking the time course of social perception: the effects of racial cues on event-related brain potentials. *Peris Soc Psychol Bull.* 2004; 30:1267-1280. [PubMed: 15466500]

78

Short Cut – Process Details Ingroup

• Researchers found cross-race effect processes outgroup members primarily at the category level (race group) at the expense of encoding individuating information.

- Ostrom TL, Carpenter SL, Sedikides C, Li F. Differential processing of in-group and out-group information. *J Pers Soc Psychol.* 1993; 64:21-34.
- Sangrigoi S, Pallin O, Alphonse AM, Ventura VA, de Schonen S. Reversibility of the other-race effect in face recognition during childhood. *Psychol Sci.* 2005; 16:440-444. [PubMed: 15943669]
- Young SG, Hugenberg K. Individuation modulation and face experience can operate jointly to produce the own-race bias. *Soc Psychol Personal Sci.* 2012; 3:80-87.



79

The Empathy Effect

• This mental process produces lower empathy for out of group members



80

Sociopolitical Context Helps Explain Harvard Bias Study Findings

82

How Did We Get Here?

Association of Blacks to Crime and Violence

- 1644 – 1st African slave in America
- 1863 – Emancipation Proclamation
- = 244 years *with* slavery
 - Theological arguments used – cursed race or less than human
- = 158 years *without* slavery

83

Convict Leasing

- In 1951, almost 90 years after the passage of the Emancipation Proclamation Congress passed explicit statutes outlawing slavery.
 - The practice of renting prisoners as labor at a fraction of the cost of regular workers was called *convict leasing*.
 - 90 percent of individuals incarcerated and forced into hard labor in the South were black males (Blackmon, 2008).
 - Blacks were arrested and prosecuted for noncriminal acts.
 - Vagrancy statutes made it a crime to be unemployed.
 - Trial records indicate spikes in arrests during harvest times and when large companies needed an influx of workers.
 - When the Emancipation Proclamation passed 92 percent of all blacks in America lived in the South (Jones, 1985).
 - As late as 1900 approximately 90 percent of blacks still lived in the South (Jones, 1985).
- The southern black experience is pervasive to black culture.*

84

Ancient History

- In 1951, Congress passed explicit statutes outlawing *convict leasing*.
- = 70 years w/o some form of slavery

85

Harvard Bias Study

Found that regardless of race or gender most Americans associate black males to crime and violence today (Levin & Banaji 2006; Dunham & Banaji, 2006; Baron & Banaji, 2006; Kalis, Banaji, & Kosslyn, 2008; Sabin, Nosek, Greenwald, & Rivara, 2009; Stanley, Sokol-Hessner, Banaji, & Phelps, 2011; Cunningham, et al. 2004; Mazzocco, et al. 2006; Green, et al. 2007).

86

Cultural Archetypes

Cultural archetypes are universal patterns across cultures or common to a culture.

- Police – “two people from different cultures can look at the same event and have very different reactions.”
- Black culture
 - Anxiety concerning police – altering nonverbal behavior
 - Based on patterns – they are right
- Police have anxiety concerning blacks and Latinos – altering nonverbal behavior
 - Based on patterns – they are right

= What you see today

However, the majority of blacks/Latinos are not criminals nor are the majority of police looking to harm people of color.

87

The New York Times, “Folly’s Antidote”
Arthur Schlesinger



88

"Folly's Antidote"

Arthur Schlesinger

"Conceptions of the past are far from stable. They are perennially revised by the urgencies of the present. When new urgencies arise in our times and lives, the historian's spotlight shifts, probing at last into the darkness, throwing into sharp relief things that were always there but that earlier historians had carelessly excised from the collective memory. New voices ring out of the historical dark and demand to be heard"

89

If conceptions of the past are far from stable. Then curriculums must be revised by the urgencies of the present.

90

What Is the Difference Between the Two Lists

- Harriet Tubman
- Dr. Martin Luther King, Jr.
- Rosa Parks
- Thurgood Marshall
- Ralph Johnson Bunche
- Musa Keita I
- Dr. Patricia Bath
- Garrett Morgan

Are You the President?

96

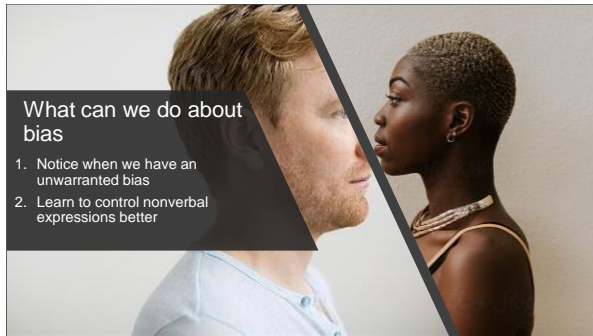
Curriculum and Bias

- Educators must consider how curriculums create collective memory and have, therefore, biased students unwittingly.
- It is clear that the lessons of the past have not reshaped our collective conscious from the biases that plague American society.
- If education maintains the status quo, it will pass on to the next generation a future that perpetuates the past.

97

What can we do about bias

1. Notice when we have an unwarranted bias
2. Learn to control nonverbal expressions better



98

Emotional Control

- Higher out-group response is lowered when the dorsolateral prefrontal cortex (DLPFC) is more active because it regulates the amygdala.
- People who have greater emotional control can better diminish emotional bias responses.
- Cunningham WA, et al. Separable neural components in the processing of black and white faces. *Psychol Sci.* 2004; 15:806-813. [PubMed: 1556325]



99



Learning Bias Associations Are Not True Rule
 3. Understand the social-political context that produces societal biases


- Long-term biases in America
 - Black males are inherently violent


100

Admiration and Respect Reduces Bias

- Exception Rule
 - Race-based preferences diminished when familiar or admired individual was viewed.
 - Richeson JA, et al. An fMRI investigation of the impact of interracial contact on executive function. Nat Neurosci. 2003; 6:1323–1328. [PubMed: 14625557]

101

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<https://www.facebook.com/Resiliency-Inc-122261404853500/>

 Horacio provides brain facts at <https://twitter.com/ResiliencyInc>

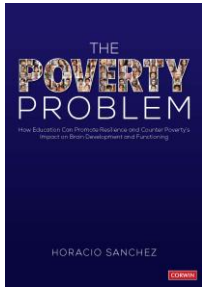
 <https://www.linkedin.com/in/hsanchezceo>

102

This may be the most important education book published recently.
- Julie Porter

The most impactful educational book you'll read!!
- Tracy Lafreniere

This book will shape our roadmap toward the essential reform we need in education!
- Vivian Scavo



103



104