Social Perception

Fall 2015

1

Elements of Social Cognition

Hastie & Carlson (1980); Kihlstrom & Hastie (1987)

- Perception
  - Vocabulary to Describe the Social Stimulus
  - Description of Perceptual Processes
- Memory
  - Characterization of Encoding Operations
  - Description of Stored Mental Representation
  - Characterization of Retrieval Operations
- Thinking ➔ Action
  - Categorization, Inference
  - Problem-Solving, Judgment and Decision-Making

2

Where Does Knowledge Come From?

- Nativist View (Descartes)
  - Some Knowledge is Innate or *A Priori*
  - Evolutionary/Genetic Heritage

- Empiricist View (Locke)
  - All Knowledge Comes Through the Senses
  - Experience, Learning
  - Reflections on Experience

- Kantian Synthesis
  - Knowledge Acquired Through Experience
  - Experience Structured by Innate Schemata

3

Two Views of Perception

- Constructivist View (Helmholtz)
  - Stimulus Inherently Ambiguous
  - Supplement with Knowledge, Inference
    - Some Inferences Are Unconscious
  - "Beyond the Information Given" (Bruner)

- Ecological View (Gibson)

  - Information "In the Light"
  - Perceptual System Evolved to Extract Information
  - No Inferences, Little or No Learning
  - aka Direct Perception (Direct Realism)

4

Sensation and Perception

- Sensation
  - Detection
    - Distal Stimulus
  - Transduction
    - Proximal Stimulus into Neural Impulse
  - Transmission
    - From Sensory Receptor to Brain
- Perception
  - Mental Representation of Distal Stimulus
    - Form, States, Activity
    - Identification, Categorization
      - "Every Act of Perception is an Act of Categorization"

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The Task of Perception

- Nonsocial Case
  - Physical Features: Form, Location, Motion
  - Functional Features: Identification, Categorization
- Social Case
  - Personal Identity
  - Physical Appearance: Gender, Race, Size
  - Demographic Features: Socioeconomic Status
  - Mental States: Thoughts, Feelings, Desires
  - Behavioral Dispositions: Personality Traits

6

Descriptions of Other People

Fiske & Cox (1979)

- Physical Attributes
  - Tall, Dark, and Handsome
- Behavioral Information
  - Neurotic Introvert
- Social Relations
  - Has a Girlfriend
- Characteristic Situations
  - Goes To Bars a Lot
- Origins
  - 2nd-Generation Norwegian
- Functional Properties
  - Makes Me Laugh

7

What one word would you use to describe Hillary Clinton?

People with a favorable opinion (49%) | People with an unfavorable opinion (44%) | DK (7%)

Survey data from YouGov | yougov.com

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Jeb Bush in one word

What one word would you use to describe Jeb Bush?

People with a favorable opinion, 29% | People with an unfavorable opinion, 39% | Don't know, 33%

YouGov | yougov.com

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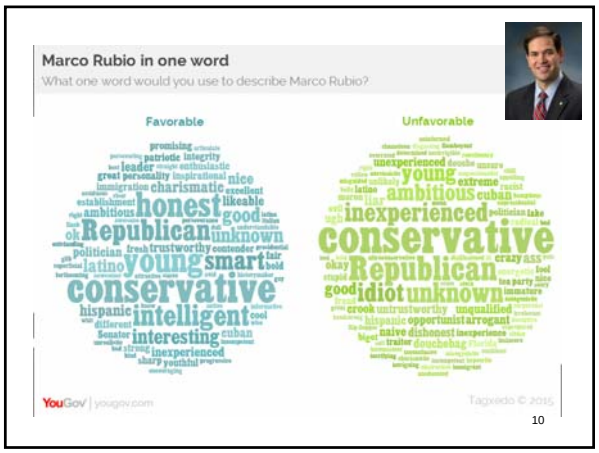
Marco Rubio in one word
What one word would you use to describe Marco Rubio?
Favorable
Unfavorable
YouGov | yougov.com
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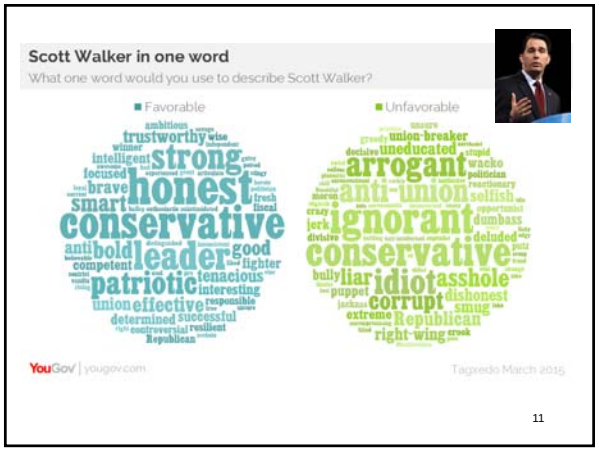
Scott Walker in one word
What one word would you use to describe Scott Walker?
Favorable
Unfavorable
YouGov | yougov.com
Tagxedo March 2015
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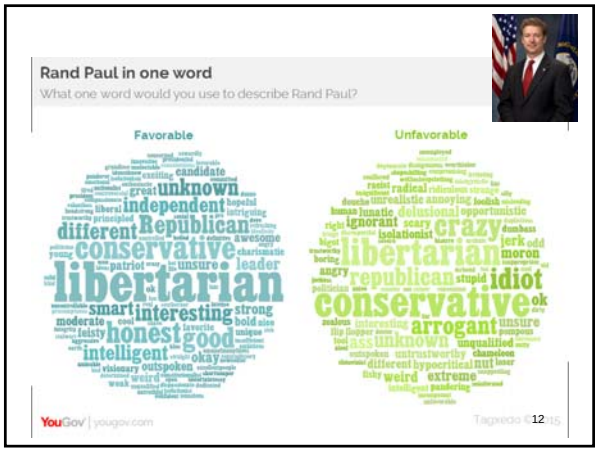
Rand Paul in one word
What one word would you use to describe Rand Paul?
Favorable
Unfavorable
YouGov | yougov.com
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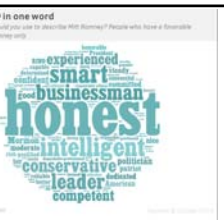

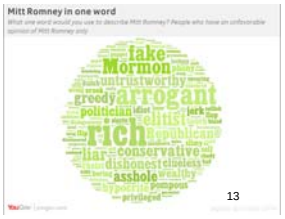

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"Personals" Ads

New York Review of Books, 1/20/2000

MJM IN NYC, likes museums, nature, ferry rides, long walks, long talks, sushi, needs a special female friend. Ex-Wall Street, now professional writer. Forty-something, 5'9", fit and muscular, attractive. Creative, playful, irreverent, intense, affectionate, outgoing, smart. Thoroughly analyzed, self-aware, very flexible weekdays. Nonsmokers only please, photo appreciated.

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"Personals" Ads

New York Review of Books, 1/20/2000

BEAUTIFUL, LITHE WOMAN in mid-forties, rare blend of art and intellect, simplicity and elegance, financially and emotionally secure, seeks man equally at home in the world, who knows himself enough to know a good thing when he finds it.

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Person Perception

Bruner & Tagiuri (1954)

- Persons as Objects of Perception
- Influences on Perceptual Organization
  - Stimulus Array
  - Selective Attention
  - Linguistic Categories
  - Internal State of Perceiver
    - Mental Set
    - Emotional, Motivational Context

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Person Perception as Impression Formation

Asch (1946)

[O]rdinarily our view of a person is highly unified. Experience confronts us with a host of actions in others, following each other in relatively unordered succession. In contrast to this unceasing movement and change in our observations we emerge with a product of considerable order and stability.

Although he possesses many tendencies, capacities, and interests, we form a view of *one* person, a view that embraces his entire being or as much of it as is accessible to us. We bring his many-sided, complex aspects into some definite relations….

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Person Perception as Impression Formation

Asch (1946)

- How do we organize the various data of observation into a single, relatively unified impression?
- How do our impressions change with time and further experiences with the person?
- What effects in impressions do other psychological processes, such as needs, expectations, and established interpersonal relations, have?

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Competing Theories of Impression Formation

- Impression is the Sum of Independent Characteristics
- Impression is a Unified Perception
  - *Gestalt* which Represents Relations Among Characteristics
  - "The Whole is Greater than the Sum of Its Parts"

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The Impression-Formation Paradigm

- Study Trait Ensemble
  - Describing Some Target Person
- Provide Impression of Target
  - Free Description
  - Adjective Checklist
  - Rating Scales

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Asch's Experiment 1

Set A	**Set B**
intelligent	intelligent
skillful	skillful
industrious	industrious
warm	*cold*
determined	determined
practical	practical
cautious	cautious

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Rating Scales

generous	humane
wise	good-looking
happy	persistent
good-natured	serious
humorous	restrained
sociable	altruistic
popular	imaginative
reliable	strong
important	honest

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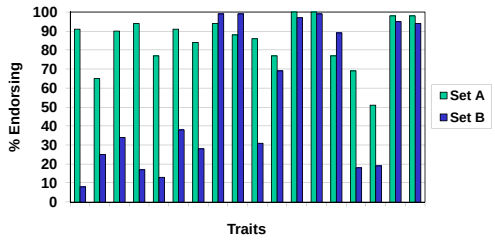
Warm-Cold Experiment

Asch (1946, Experiment 1)



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Rating Scales

- generous*
- wise*
- happy*
- good-natured*
- humorous*
- sociable*
- popular*
- reliable
- important
- humane*
- good-looking
- persistent
- serious
- restrained
- altruistic*
- imaginative*
- strong
- honest

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Asch's Experiment 3

Set A	**Set B**
intelligent	intelligent
skillful	skillful
industrious	industrious
polite	*blunt*
determined	determined
practical	practical
cautious	cautious

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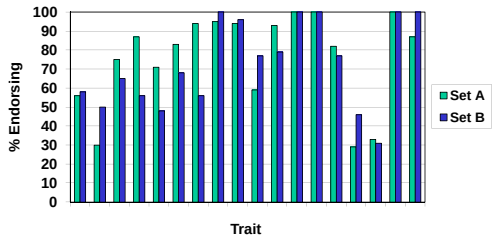
Polite-Blunt Experiment

Asch (1946), Experiment 3



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Central Traits

- Qualities that, When Changed, Alter the Entire Impression of a Person
- Not "Halo Effect" (Thurstone)
  - Not Undifferentiated
- Change of Meaning Hypothesis
  - Environmental Surround Changes Meaning of Individual Elements
  - Central Traits Alter Meaning of Other Traits

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Examples of Central and Peripheral Traits

Central	Peripheral
Warm - Cold	*Polite-Blunt*
Intelligent - Unintelligent	

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Order Effects in Impression Formation

Set A	**Set B**
intelligent	envious
industrious	stubborn
impulsive	critical
critical	impulsive
stubborn	industrious
envious	*intelligent*

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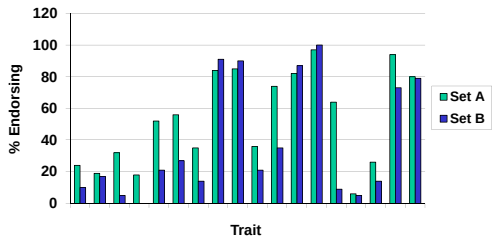
Order Effects of *Intelligent*

Asch (1946), Experiment 6



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Order Effects

- Initial Terms Set Up a Directed Impression
- Later Terms Interpreted Through “First Impression”
- Renders Perception Stable

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Features of Impression Formation

Asch (1946)

- Order Effects
- Central vs. Peripheral Traits

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What Makes a Trait Central?

Wishner (1960)

- Central Traits Carry More Information Than Peripheral Traits
  - Convey More Implications for Unobserved Features
- Change in Central Trait Implies Change in Many Other Traits

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Rosenberg's Reanalysis

Rosenberg et al. (1968); Rosenberg & Sedlak (1972)

- Factor Analysis of Trait Ratings
- Hierarchical Structure
  - Primary Traits
  - Secondary Traits
  - Tertiary Traits
- Superfactors in Personality Ratings
  - Social Good-Bad
  - Intellectual Good-Bad

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Fig. 7.1 Dimensions of traits. (From Rosenberg *et al.* 1968.)

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Fiske's Restatement

Fiske et al. (2007)

	Warm	Cold
Competent	"Our IN group" "Us", as opposed to "Them"	"Objects of Envy" Jews Asians "The 1%" Female Professionals
Incompetent	"Mean Well" Elderly Disabled Mentally Ill	"Society's Outcasts" Poor Homeless Substance Abusers

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What Makes a Trait Central?

Rosenberg et al. (1968)

- Load Highly on Superordinate Factors
  - Intellectual, Social Good/Bad
- Carry More Information than Other Traits
  - More Implications for Unobserved Features
- Context Matters
  - Selection of Rating Scales

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Five-Factor Model: A Better Fit?

Goldberg (1981)

- Neuroticism
- Extraversion
- Agreeableness
- Conscientiousness
- Openness to Experience

A *Universal* Structure of Personality (?)

Encoded in Language

Valid Across Cultures

Valid Across Generations, Developmental Epochs

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The "Big Five" Blind Date Questions

Is s/he Outgoing?

Is s/he Crazy?

Is s/he Friendly?

Is s/he Reliable?

Is s/he Interesting?

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Markers of the Big Five

Norman (1963)

- Extroversion (Surgency)
  - Talkative-Silent
  - Frank, Open-Secretive
  - Adventurous-Cautious
  - Sociable-Reclusive
- Agreeableness
  - Goodnatured-Irritable
  - Not Jealous-Jealous
  - Mild, Gentle-Headstrong
  - Cooperative-Negativistic
- Conscientiousness
  - Fussy, Tidy-Careless
  - Responsible-Undependable
  - Scrupulous-Unscrupulous
  - Persevering-Quitting, Fickle
- Emotional Stability
  - Poised-Nervous, Tense
  - Calm-Anxious
  - Composed-Excitable
  - Not Hypochondriacal-Hypochondriacal
- Culture
  - Artistically Sensitive-Artistically Insensitive
  - Intellectual-Unreflective, Narrow
  - Polished, Refined-Crude, Boorish
  - Imaginative-Simple, Direct

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Average Factor Loadings: *A Priori* Markers of the Big Five

Norman (1963); Passini & Norman (1968)

Factor	Study		
	Norman (1963) Sample C[a]	Norman (1963) Sample D[b]	Passini & Norman (1968)[c]
Extroversion	.83	.85	.75
Agreeableness	.75	.77	.67
Conscientiousness	.74	.39	.63
Emotional Stability	.70	.69	.62
Culture	.66	.68	.58

Note: Values are Unweighted Averages

[a]Fraternity Members [b]Dormitory Members [c]Strangers

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Perceiving Objects and Their States

- Nonsocial Domain
  - Form
  - Location
  - Motion
- Social Domain
  - Traits
  - Emotions
  - Motives
  - Behaviors

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Stimulus Information in Perception

- Nonsocial Domain
  - Energy Radiating from Distal Stimulus
  - Impinging on Sensory Receptors
- Social Domain
  - Linguistic Description
  - Appearance
  - Behavior

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Person Perception vs. Impression Formation

- Traits as Linguistic Representations
  - Persons
  - Behavior

What *Physical* Features of the Stimulus Give Rise to Language-Based Impressions?

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The Ecological View of Social Perception

Baron (1980); McArthur & Baron (1983)
after Gibson (1959, 1979)

All the Information
Needed for Social Perception
is Provided by the Stimulus Field

No Need for "Higher" Cognitive Processes
No Need for Implicit Theories of Personality

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Stimulus Information in Social Perception

Baron (1980); McArthur & Baron (1983)

- Facial Expressions
- Bodily Orientation, Movement, Posture
- Vocal Cues
- Interpersonal Distance
- Eye Contact, Touching
- Physical Appearance, Dress
- Local Behavioral Environment
  - Aspects of Situation Under Target's Control

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Facial Expressions of Emotion

Ekman & Friesen (1975)

- Verbal vs. Nonverbal Communication
- Detection of Deception
  - "Leakage" of Nonverbal Cues
- C. Darwin
  - *The Expression of the Emotions in Men and Animals* (1872)
- Expression Implies Perception

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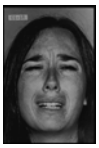
Basic Emotions

Ekman (2003)
Ekman & Friesen (1975); Ekman (1975)



Joy
Sadness
Fear
Anger
Surprise
Disgust

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Facial Cues to Happiness

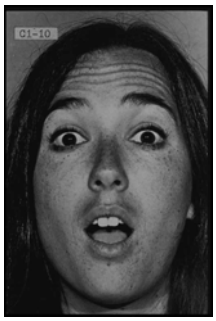
After Tomkins (1962), Ekman & Friesen (1975)

- Smile
- Showing Teeth(?)

Facial Cues to Surprise

After Tomkins (1962), Ekman & Friesen (1975)

- Widening of Eyes
- Open Mouth



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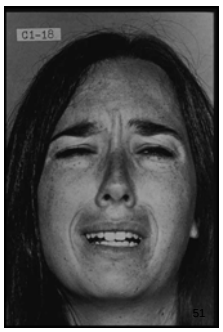
Facial Cues to Sadness

After Tomkins (1962), Ekman & Friesen (1975)

- Eyebrows Lowered
  - Esp., Outer Corners
- Mouth Closed
- Push Lower Lip Out



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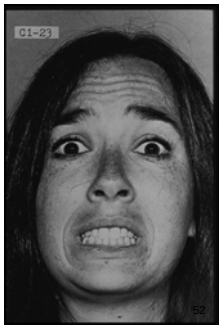
Facial Cues to Fear

After Tomkins (1962), Ekman & Friesen (1975)

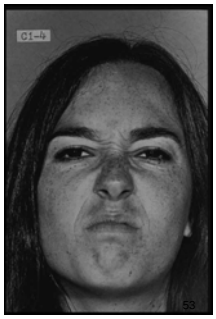
- Eyebrows Raised
- Eyes Opened Wide
- Head Held Back
- Chin Tucked In
- Mouth Open



Facial Cues to Disgust

After Tomkins (1962), Ekman & Friesen (1975)

- Eyes Narrow, Squinting
- Upper Lip Raised
- Nostrils Flair



Facial Cues to Anger

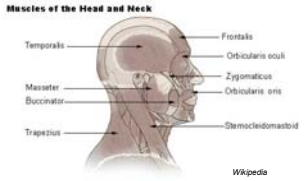
After Tomkins (1962), Ekman & Friesen (1975)

- Eyebrows Drawn Down and Together
- Raise Upper Eyelid
- Press Lips Together
- Push Lower Lip Up
- Contract Jaw Muscles

Facial Action Coding System

Ekman & Friesen (1978); Hager, Ekman, & Friesen (2002), after Hjortsjo (1970)

- 66 Coding Categories
- Muscle Action Units
  - Inner Brow Raiser
  - Lip Corner Puller
  - Jaw Clencher
- Action Descriptors
  - Tongue Out
  - Lip Wipe
  - Head Back



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Muscle Actions for Anger

Ekman & Friesen (1975)

- Eyebrows Drawn Down and Together
  - *Depressor glabellae*
  - *Depressor supercilii*
  - *Corrugator*
- Raise Upper Eyelid
  - *Levator palpebrae superioris*
- Press Lips Together
  - *Orbicularis oris*
- Push Lower Lip Up
  - *Mentalis*
- Contract Jaw Muscles
  - *Buccinator*

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Two Kinds of Smile

- "Duchenne Smile"
  - Genuine, Involuntary
    - *Orbicularis oculi*
    - *Zygomaticus major*
- *"Pan-American Smile"*
  - Polite, Voluntary
    - *Zygomaticus major* only

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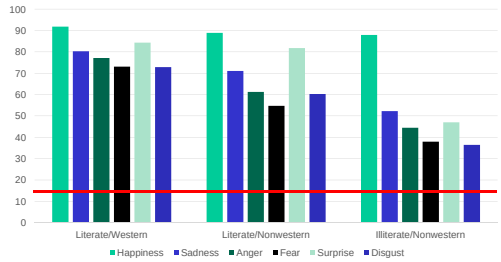
Accuracy of Emotion Recognition

Russell (1994, 1997); Nelson & Russell (2013)



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The Universality Thesis…

Duchenne (1872); Darwin (1872);
Tomkins (1962); Izard (1971); Ekman (1972); Shariff & Tracy (2011)

- Facial Expressions of Basic Emotions are Universally Recognized
- Product of Our Evolutionary Heritage
  - Innate
  - Shared with Some Nonhumans (esp. Primates)
- Product of "Bottom-Up" Processing
  - Direct, Automatic Readout from Facial Musculature
- Invariant Across Culture
  - Contact with Western Culture; Literacy, Development

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…and Its Discontents

Barrett (2011); Hassin et al. (2013); Nelson & Russell (2013)

- Accuracy Not Constant Across Emotions
- Context is Important
  - Background
  - Bodily Posture
- Methodological Issues
  - Posed vs. Spontaneous
  - Presentation of Multiple Expressions
  - Within-Subjects Design
  - Forced-Choice vs. Free-Response Format

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Detection of Deception

DePaulo et al. (1996)

- Lying a Common Feature of Social Interaction
  - Lies Occur on a Daily Basis (1-2/Day)
    - College Students: 1/3 of Social Interactions
    - Community Sample: 1/5 of Social Interactions
- Typical Lie is Trivial
  - Self-Oriented
    - Enhance Socially Desirable Traits
    - Escape Punishment
  - Other-Oriented
    - Protect Feelings of Others
    - Protect Relationships

Lie-Detection Accuracy

Ekman & O'Sullivan (1991)

- Detection of Deception Measure
  - 10 1-Second Interview Segments
    - Half Truth-Telling, Half Lying
- Full Head-On View of Face and Body
- Target Describes Positive Emotions
  - Ostensibly Viewing a Nature Scene
  - Half of Targets Viewing Gruesome Scene
- Can Subjects Tell Who is Lying?

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Lie-Detection Accuracy

Ekman & O'Sullivan (1991)

- College Students
- Adult Extension Students
- Psychiatrists
- Judges
- Robbery Investigators
- Federal Polygraphers
- Secret Service Agents

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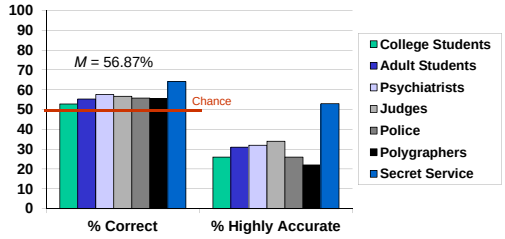
Accuracy in Detection of Deception

Ekman & O'Sullivan (1991)



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Lie-Detection Accuracy Revisited

Ekman et al. (1999)

- Academic Psychologists
- Clinical Psychologists
- "Special Interest" Psychologists
- Law-Enforcement Officers
- Federal Judges
- Sheriffs
- Federal Officers (mostly CIA)

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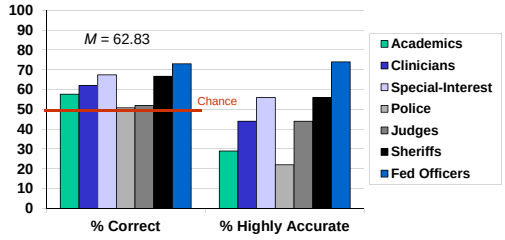
Accuracy in Detection of Deception

Ekman et al. (1999)



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How To Tell a Liar

Ekman & O'Sullivan (1991); Ekman et al. (1999)

- "Leakage" Through Nonverbal Cues
  - Facial
    - "Duchenne" Smiles When Telling Truth
    - "Pan-American" Smiles When Lying
  - Vocal
    - Increase in Fundamental Pitch
- Detected through Special Means
  - Trained Coders, Computer-Based Measures
- Can Also Be Picked Up in Real Time

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Problems with "Accuracy"

- Only Takes Correct Responses into Account
  - True Positives, True Negatives
- Doesn't Take Errors into Account
  - False Positives, False Negatives
- Precision (Positive Predictive Value)
  - PPV = TP / (TP + FP)
- Sensitivity (True Positive Rate)
  - S = TP / (TP + FN)

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Signal-Detection Theory

Green & Swets (1966), after Tanner & Swets (1954)

- Discriminate between "Signal" and "Noise"
- Components of Decision
  - Sensitivity (Information) – *d', A'*
    - Bias-Free
  - Bias (Criterion) – *β*, *C, B"*
    - Expectation
    - Motivation

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The Signal Detection Paradigm

Green & Swets (1966)

Response	***Signal***	
	On	*Off (Catch Trials)*
"Yes"	**HIT**	**FALSE ALARM**
"No"	**MISS**	Correct Rejection

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Lie Detection as Signal Detection

Judgment	*Target*	
	Lying	Not Lying
Lying	*HIT*	*FALSE ALARM*
Not Lying	*MISS*	*CORRECT REJECTION*

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Signal-Detection Analysis:

Federal Officers

Ekman et al. (1999)

Judgment	*Target*	
	Lying	Not Lying
Lying	*80.0*	*33.9*
Not Lying	*20.0*	*66.1*

d' = 1.257 *C* = -.21

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d' Measure of Sensitivity

Ekman et al. (1999): Federal Officers Only
0 = No Sensitivity
- = *Worse* Than Chance

Hits

False Alarms	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	0.00	1.05	1.49	1.80	2.07	2.33	2.58	2.85	3.17	3.61	4.65
.10	-1.05	0.00	.44	.76	1.03	1.28	1.54	1.81	2.12	2.56	3.61
.20	-1.49	-.44	0.00	.32	.59	.84	1.10	1.37	1.68	2.12	3.17
.30	-1.80	-.76	-.32	0.00	.27	.52	.78	1.05	1.37	1.81	2.85
.40	-2.07	-1.03	-.59	-.27	0.00	.25	.51	.78	1.10	1.54	2.58
.50	-2.33	-1.28	-.84	-.53	-.25	0.00	.25	.53	.84	1.28	2.33
.60	-2.58	-1.54	-1.10	-.78	-.51	-.25	0.00	.27	.59	1.03	2.07
.70	-2.85	-1.81	-1.37	-1.05	-.78	-.52	-.27	0.00	.32	.76	1.80
.80	-3.17	-2.12	-1.68	-1.37	-1.10	-.84	-.59	-.32	0.00	.44	1.49
.90	-3.61	-2.56	-2.12	-1.81	-1.54	-1.28	-1.03	-.76	-.44	0.00	1.05
.99	-4.65	-3.61	-3.17	-2.85	-2.58	-2.33	-2.07	-1.80	-1.49	-1.05	0.00

73

C Measure of Bias

Ekman et al. (1999): Federal Officers Only
- = Liberal Bias toward "Yes" (Calling Targets Liars)
+ = Conservative Bias toward "No" Calling Targets Truthtellers

Hits

False Alarms	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	2.33	1.80	1.54	1.43	1.29	1.16	1.04	.90	.74	.52	.00
.10	1.80	1.28	1.06	.90	.77	.64	.51	.38	.22	.00	-.52
.20	1.58	1.06	.84	.68	.55	.42	.29	.16	.00	-.22	-.74
.30	1.42	.90	.68	.52	.39	.26	.14	.00	-.16	-.38	-.90
.40	1.29	.77	.55	.39	.25	.13	.00	-.14	-.29	-.51	-1.04
.50	1.63	.64	.42	.26	.13	.00	-.13	-.26	-.42	-.64	-1.16
.60	1.04	.51	.29	.14	.00	-.13	-.25	-.39	-.55	-.77	-1.30
.70	.90	.38	.16	.00	-.14	-.26	-.39	-.52	-.68	-.90	-1.43
.80	.74	.22	.00	-.16	-.29	-.42	-.55	-.68	-.84	-1.06	-1.58
.90	.52	.00	-.22	-.38	-.51	-.64	-.77	-.90	-1.06	-1.28	-1.80
.99	.00	-.52	-.74	-.90	-1.04	-1.16	-1.29	-1.43	-1.58	-1.80	-2.32

74

Signal-Detection Analysis:

All Subjects
Ekman et al. (1999)

Judgment	*Target* Lying	Not Lying
Lying	*65.5*	*39.9*
Not Lying	*34.5*	*60.1*

d' = .66 *C* = -.07

75

d' Measure of Sensitivity

Ekman et al. (1999): All Subjects
0 = No Sensitivity
- = *Worse* Than Chance

False Alarms \ Hits	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	0.00	1.05	1.49	1.80	2.07	2.33	2.58	2.85	3.17	3.61	4.65
.10	-1.05	0.00	.44	.76	1.03	1.28	1.54	1.81	2.12	2.56	3.61
.20	-1.49	-.44	0.00	.32	.59	.84	1.10	1.37	1.68	2.12	3.17
.30	-1.80	-.76	-.32	0.00	.27	.52	.78	1.05	1.37	1.81	2.85
.40	-2.07	-1.03	-.59	-.27	0.00	.25	.51	.78	1.10	1.54	2.58
.50	-2.33	-1.28	-.84	-.53	-.25	0.00	.25	.53	.84	1.28	2.33
.60	-2.58	-1.54	-1.10	-.78	-.51	-.25	0.00	.27	.59	1.03	2.07
.70	-2.85	-1.81	-1.37	-1.05	-.78	-.52	-.27	0.00	.32	.76	1.80
.80	-3.17	-2.12	-1.68	-1.37	-1.10	-.84	-.59	-.32	0.00	.44	1.49
.90	-3.61	-2.56	-2.12	-1.81	-1.54	-1.28	-1.03	-.76	-.44	0.00	1.05
.99	-4.65	-3.61	-3.17	-2.85	-2.58	-2.33	-2.07	-1.80	-1.49	-1.05	0.00

76

C Measure of Bias

Ekman et al. (1999): All Subjects
- = Liberal Bias toward "Yes" (Calling Targets Liars)
+ = Conservative Bias toward "No" (Calling Targets Truthtellers)

False Alarms \ Hits	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	2.33	1.80	1.54	1.43	1.29	1.16	1.04	.90	.74	.52	.00
.10	1.80	1.28	1.06	.90	.77	.64	.51	.38	.22	.00	-.52
.20	1.58	1.06	.84	.68	.55	.42	.29	.16	.00	-.22	-.74
.30	1.42	.90	.68	.52	.39	.26	.14	.00	-.16	-.38	-.90
.40	1.29	.77	.55	.39	.25	.13	.00	-.14	-.29	-.51	-1.04
.50	1.63	.64	.42	.26	.13	.00	-.13	-.26	-.42	-.64	-1.16
.60	1.04	.51	.29	.14	.00	-.13	-.25	-.39	-.55	-.77	-1.30
.70	.90	.38	.16	.00	-.14	-.26	-.39	-.52	-.68	-.90	-1.43
.80	.74	.22	.00	-.16	-.29	-.42	-.55	-.68	-.84	-1.06	-1.58
.90	.52	.00	-.22	-.38	-.51	-.64	-.77	-.90	-1.06	-1.28	-1.80
.99	.00	-.52	-.74	-.90	-1.04	-1.16	-1.29	-1.43	-1.58	-1.80	-2.33

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The Problem of Representativeness

- Detection of Deception Measure (DDM)
  - 10 of 31 Targets Who Leaked Cues (32%)
  - 21 of 31 Targets Did Not Leak (68%)
- DDM Measures Lie-Detecting Ability
  - *When Cues to Lying are Available in the Stimulus*
- But Cues to Lying are Not Always Present
  - Or Even Particularly Often!

The Problem with Lie-Detection:
Not that People Are Bad Lie Detectors
People Are Good Liars!

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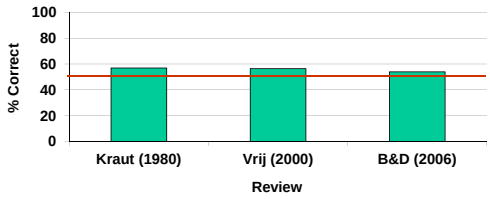
"Subjective" Judgments of Deception

Bond & DePaulo (2006)

Dichotomous Judgments



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Signal-Detection Analysis:

384 Samples, *N* = 24,483

Bond & DePaulo (2006)

	Target	
Judgment	Lying	Not Lying
Lying	*47*	*39*
Not Lying	*53*	*61*

d' = .20 *C* = .18

80

d' Measure of Sensitivity

Bond & DePaulo (2006)

0 = No Sensitivity

- = *Worse* Than Chance

Hits

False Alarms	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	0.00	1.05	1.49	1.80	2.07	2.33	2.58	2.85	3.17	3.61	4.65
.10	-1.05	0.00	.44	.76	1.03	1.28	1.54	1.81	2.12	2.56	3.61
.20	-1.49	-.44	0.00	.32	.59	.84	1.10	1.37	1.68	2.12	3.17
.30	-1.80	-.76	-.32	0.00	.27	.52	.78	1.05	1.37	1.81	2.85
.40	-2.07	-1.03	-.59	-.27	0.00	.25	.51	.78	1.10	1.54	2.58
.50	-2.33	-1.28	-.84	-.53	-.25	0.00	.25	.53	.84	1.28	2.33
.60	-2.58	-1.54	-1.10	-.78	-.51	-.25	0.00	.27	.59	1.03	2.07
.70	-2.85	-1.81	-1.37	-1.05	-.78	-.52	-.27	0.00	.32	.76	1.80
.80	-3.17	-2.12	-1.68	-1.37	-1.10	-.84	-.59	-.32	0.00	.44	1.49
.90	-3.61	-2.56	-2.12	-1.81	-1.54	-1.28	-1.03	-.76	-.44	0.00	1.05
.99	-4.65	-3.61	-3.17	-2.85	-2.58	-2.33	-2.07	-1.80	-1.49	-1.05	0.00

81

C Measure of Bias

Bond & DePaulo (2006)

- = Liberal Bias toward "Yes" (Calling Targets Liars)

+ = Conservative Bias toward "No" (Calling Targets Truthtellers)

Hits

False Alarms	.01	.10	.20	.30	.40	.50	.60	.70	.80	.90	.99
.01	2.33	1.80	1.54	1.43	1.29	1.16	1.04	.90	.74	.52	.00
.10	1.80	1.28	1.06	.90	.77	.64	.51	.38	.22	.00	-.52
.20	1.58	1.06	.84	.68	.55	.42	.29	.16	.00	-.22	-.74
.30	1.42	.90	.68	.52	.39	.26	.14	.00	-.16	-.38	-.90
.40	1.29	.77	.55	.39	.25	.13	.00	-.14	-.29	-.51	-1.04
.50	1.63	.64	.42	.26	.13	.00	-.13	-.26	-.42	-.64	-1.16
.60	1.04	.51	.29	.14	.00	-.13	-.25	-.39	-.55	-.77	-1.30
.70	.90	.38	.16	.00	-.14	-.26	-.39	-.52	-.68	-.90	-1.43
.80	.74	.22	.00	-.16	-.29	-.42	-.55	-.68	-.84	-1.06	-1.58
.90	.52	.00	-.22	-.38	-.51	-.64	-.77	-.90	-1.06	-1.28	-1.80
.99	.00	-.52	-.74	-.90	-1.04	-1.16	-1.29	-1.43	-1.58	-1.80	-2.33

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Variables Affecting Detection Accuracy

Bond & DePaulo (2006)

- Scale (Dichotomous vs. Continuous)
- Modality (Auditory, Visual, Both)
- Motivation to be Believed
- Preparation for Deception
- Receiver's Prior Exposure to Sender
- Exposure (Receiver vs. 3rd Party)
- Receiver Expertise

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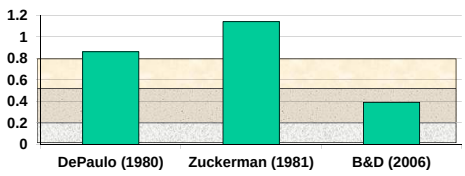
Continuous Ratings of Honesty

Bond & DePaulo (2006)



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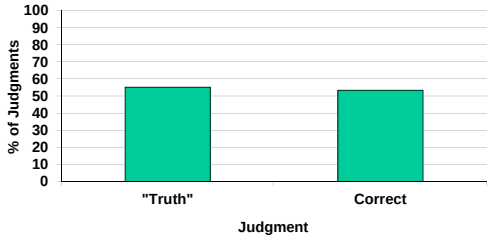
The Truth Bias

Vrij (2000); Bond & DePaulo (2006)



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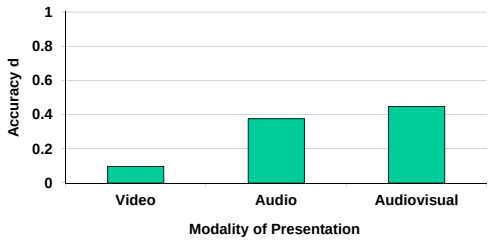
Modality Effect

Bond & DePaulo (2006)



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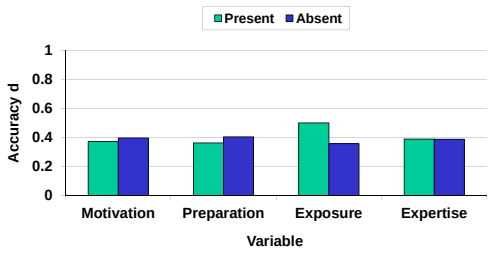
Effects on Detection of Deception

Bond & DePaulo (2006)



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The Paradox of Motivation

Bond & DePaulo (2006)

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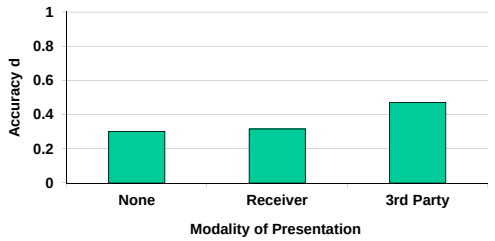
Effects of Interaction

Bond & DePaulo (2006)



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Subjective Judgments of Deception

Bond & DePaulo (2006)

- Accuracy Barely Better than Chance
  - But Moderate Effect Size
- Audible Lies More Detectable
  - Face is a Poor Cue
  - Gesture Largely Unstudied
- Paradox of Motivation
- Social Interaction
  - Onlookers vs. Receivers

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Objective Lie-Detection

Hartwig & Bond (2014)

- "Lies are Barely Evident in Behavior"
  - True for Human Lie-Detectors
  - What About Statistical Algorithms?
- New Meta-Analysis
  - 144 Samples, 9,411 "Senders"
  - Number of Cues: 2-255
    - Visible
    - Written
    - Speech Content
    - Vocal
    - Impression

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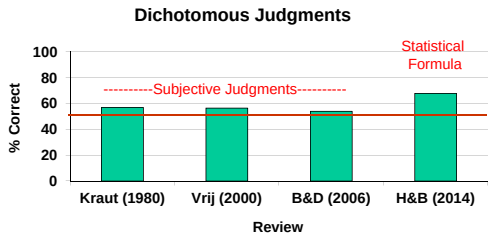
Detection of Deception

Hartwig & Bond (2014), after Bond & DePaulo (2006)



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Clinical vs. Statistical Prediction

Hartwig & Bond (2014), after Meehl (1954)

- Detection by Explicit Judgment
  - Barely Above Chance (54%)
- Detection by Statistical Algorithm
  - Multiple Regression ➔ Substantial Improvement (68%)
- Highly Stable Across Conditions
  - Liar's Demographic Background
  - Motivation to Lie
  - Social Setting
  - Deception Medium
  - Affective State
  - Content of Lie

"Signals of deception are manifested in constellations rather than single cues"

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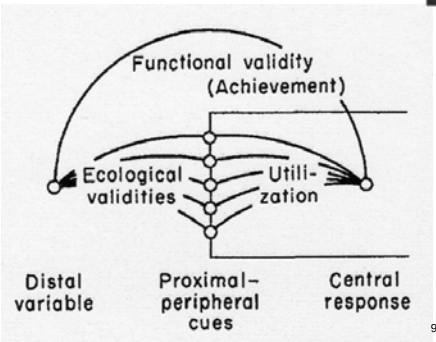
The Original Lens Model

Brunswik (1943, 1955)



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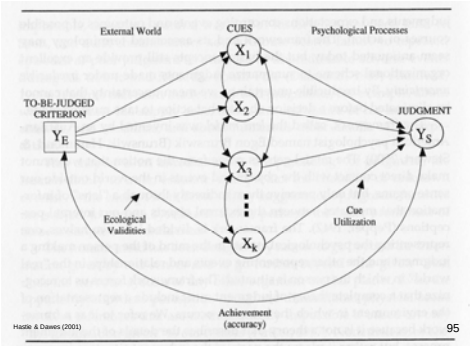
The Standard Lens Model

After Brunswik (1955)



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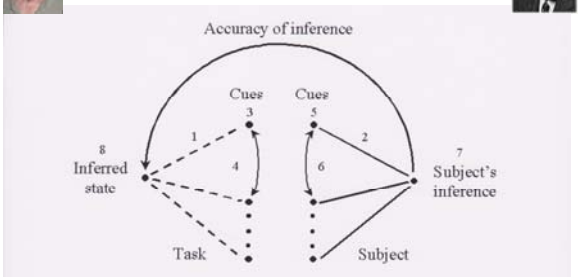
The Full Lens Model

Hammond (1998), after Brunswik (1955)



1. Ecological Validity
2. Cue Utilization
3. Objective Cue Values
5. Subjective Cue Values
4. Objective Cue Intercorrelations
6. Subjective Cue Intercorrelations
8. Inferred State (Stimulus)
7. Judgment (Response)

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Cues to Deception

DePaulo et al. (2003); Hartwig & Bond (2011)

- 116 Papers, 120 Samples, 1,338 Effect Sizes
- 158 Cues to Deception in "Ordinary Lies"
  - Less Forthcoming
  - Less Compelling
  - Less Positive/Pleasant
  - More Tense
  - Fewer Imperfections

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Cues to Judgments of Deception

Hartwig & Bond (2011)

- Cues to Perceived Deception (r > .40)
  - Internal Inconsistencies/Discrepancies
  - Fidgeting
  - Statements Seem Planned/Rehearsed
  - Uncertainty, Insecurity, Lack of Assertiveness
  - Indifference
- Cues to Perceived Truthtelling (r > -.40)
  - Competence
  - Embedding Events in Spatial/Temporal Context
  - Realistic
  - Plausibility
  - Pleasant Face

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Cues to Actual Deception

Hartwig & Bond (2011)

- Cues to Actual Deception (r > .19)
  - Indifference
  - Thinking Hard
  - Internally Inconsistent/Discrepant
  - Statement Seems Planned/Rehearsed
  - Miscellaneous Speech Disturbances
- Cues to Actual Truthtelling (r > -.20)
  - Cooperativeness
  - Vocal Impressions of Directness
  - Sensory Information
  - Embedding Events in Spatial/Temporal Context
  - Number of Behavioral Segments

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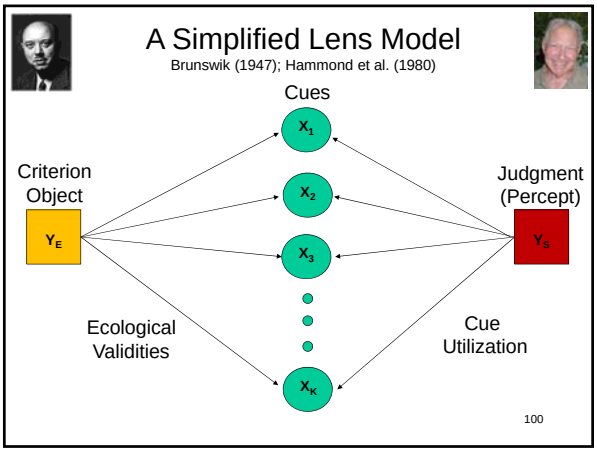
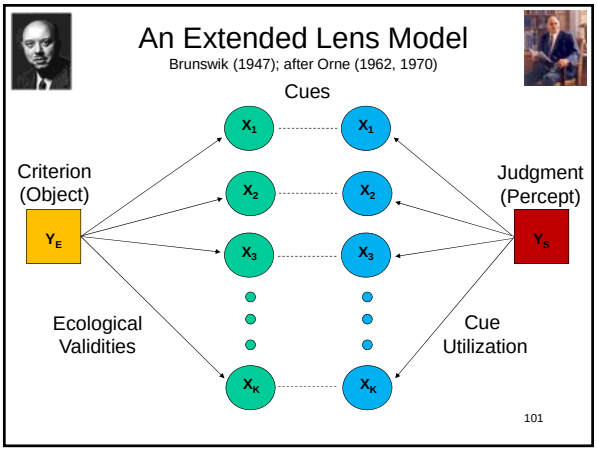
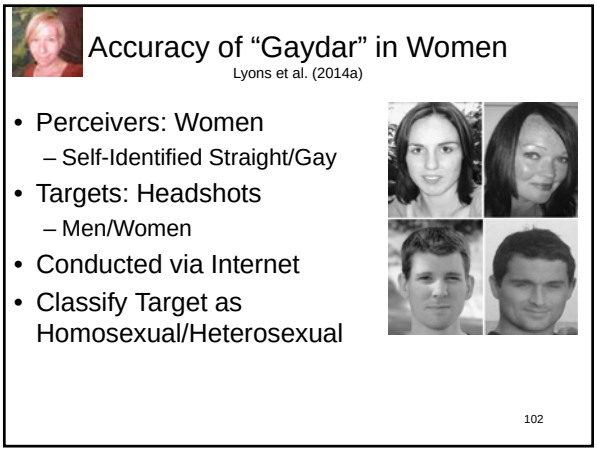

A Simplified Lens Model
Brunswik (1947); Hammond et al. (1980)
Cues
Criterion Object
Judgment (Percept)
Y_E
Y_S
X_1
X_2
X_3
X_K
Ecological Validities
Cue Utilization
100


An Extended Lens Model
Brunswik (1947); after Orne (1962, 1970)
Cues
Criterion (Object)
Judgment (Percept)
Y_E
Y_S
X_1
X_2
X_3
X_K
Ecological Validities
Cue Utilization
101


Accuracy of "Gaydar" in Women
Lyons et al. (2014a)
• Perceivers: Women
– Self-Identified Straight/Gay
• Targets: Headshots
– Men/Women
• Conducted via Internet
• Classify Target as Homosexual/Heterosexual
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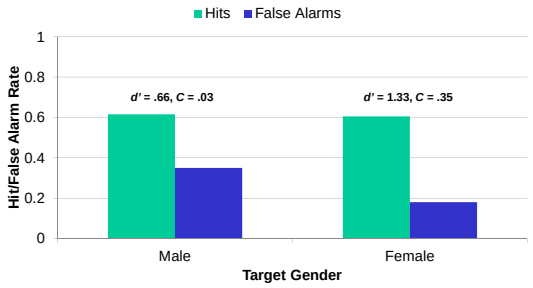
Accuracy of "Gaydar"

Lyons et al. (2014a), Study 1



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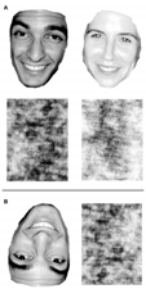
Featural and Configural Face Processing

Tabak & Zayas (2012)

- Perceivers: College Women
  - Unknown Sexual Orientation
- Gay/Straight Male/Female Targets
  - Self-Identified on Facebook
  - Faces Only
    - Upright
      - Permits Featural and Configural Processing
    - Upside-Down
      - Impairs Configural Processing



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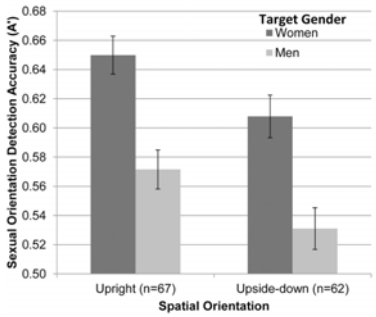
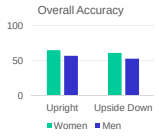
Accuracy of Detection

Tabak & Zayas (2012)





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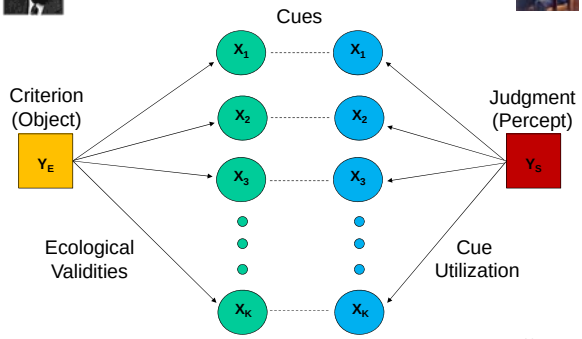
An Extended Lens Model

Brunswik (1947); after Orne (1962, 1970)



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The Problem of Base-Rate Fallacy

Kahneman & Tversky (1974)

- People Tend to Ignore Base Rates When Making Judgments
- People in General
  - Truth-Tellers > Liars
  - Heterosexuals > Homosexuals
- Error Likely When Base Rates Are Low
  - Oversample Target Group
    - Liars
    - Homosexuals

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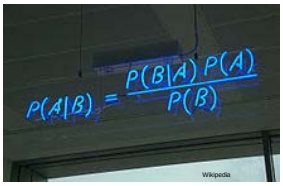
Bayes' Theorem

Bayes (1763)

- What is the likelihood that something (A) is true, given the evidence (B)
  - Take Account of Baserates
    - Likelihood that A is True, regardless of B
    - Likelihood that B is True, regardless of A



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Elements of Bayes' Theorem

- *p*(H|O)
  - Updated Posterior Probability of H
    - Probability that a Hypothesis is True, Given Observation
- *p*(O|H)
  - Probability of Observation, Given Hypothesis
- *p*(H)
  - Prior Probability of Hypothesis, Before Observation
- *p*(O)
  - Prior Probability of Observation, Regardless of H

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Bayes' Theorem Restated

Hastie & Dawes (2001)

Posterior Probability that a Hypothesis (H) is True, Given Observation (O)
Probability of O, Given H
Prior Probability (Baserate) of H, Regardless of O
Prior Probability (Baserate) of O, Regardless of H

$$\boldsymbol{p(H|O)} = \frac{p(O|H) * p(H)}{p(O)}$$

$$= \frac{p(O|H) * p(H)}{(p(O|H) * p(H)) + (p(O|\neg H) * p(\neg H))}$$

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Applying Bayes' Theorem to Gaydar

Ploderl (2014)

Cue	Reality
+ = Present	G = Gay
- = Absent	S = Straight
Assume: 5% Gay, 95% Straight	

$$p(G|+) = \frac{p(+|G) * p(G)}{p(+)}$$

$$= \frac{.65 * .05}{(.65 * .05) + (.20 * .95)} = .15$$

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Applying Bayes' Theorem to Lie-Detection

Data from Bond & DePaulo (2006)

Judgment	Reality
+ = Cue Present	L = Liar
- = Cue Absent	T = Truthteller
Assume: 50% Liars, 50% Truthtellers	

$$p(L|+) = \frac{p(+|L) * p(L)}{p(+)}$$

$$= \frac{.47 * .50}{(.47 * .50) + (.39 * .50)} = .54$$

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Applying Bayes' Theorem to Lie-Detection

Data from Bond & DePaulo (2006)

Judgment	Reality
+ = Cue Present	L = Liar
- = Cue Absent	T = Truthteller
Assume: 10% Liars, 90% Truthtellers	

$$p(L|+) = \frac{p(+|L) * p(L)}{p(+)}$$

$$= \frac{.47 * .10}{(.47 * .10) + (.39 * .90)} = .12$$

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Applying Bayes' Theorem to Lie-Detection

Data from Ekman et al. (1999)

Judgment	Reality
+ = Cue Present	L = Liar
- = Cue Absent	T = Truthteller
Assume: 10% Liars, 90% Truthtellers	

$$p(L|+) = \frac{p(+|L) * p(L)}{p(+)}$$

$$= \frac{.80 * .11}{(.80 * .11) + (.34 * .89)} = .21$$

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Applying Bayes' Theorem to Lie-Detection

Data from Ekman et al. (1999)

Judgment	Reality
+ = Cue Present	L = Liar
- = Cue Absent	T = Truthteller
4 Hijackers Among 37 passengers on Flight 93	

$$p(L|+) = \frac{p(+|L) * p(L)}{p(+)}$$

$$= \frac{.80 * .11}{(.80 * .11) + (.34 * .89)} = .23$$

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Applying Bayes' Theorem to Lie-Detection

Data from Ekman et al. (1999)

Judgment	Reality
+ = Cue Present	L = Liar
- = Cue Absent	T = Truthteller
4 Hijackers among 82,000 Passengers in Newark on 9/11	

$$p(L|+) = \frac{p(+|L) * p(L)}{p(+)}$$

$$= \frac{.80 * .00005}{(.47 * .00005) + (.39 * .99995)} = .0001$$

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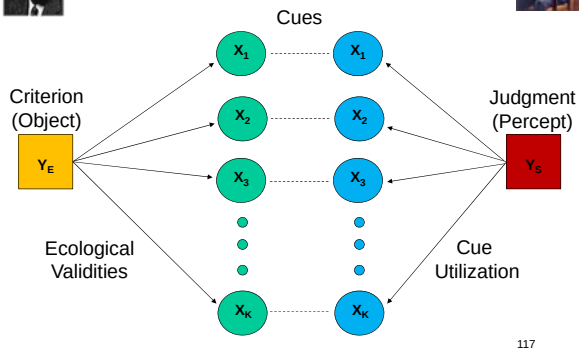
An Extended Lens Model

Brunswik (1947); after Orne (1962, 1970)



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Information for Perception

- Information in the Stimulus
  - Physical Features, Configuration
  - Linguistic Description
- Information in the Context (Background)
  - Broader than Gibsonian Construal
- Knowledge in Memory
  - Semantic, Procedural
  - Expectations
  - Beliefs

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