Announcements

No instructor office today
Next Aplia due tonight
Exam review features now functional
From last time...
Key Aspects of Emotional Experience

A. Subjective experience
B. Physiological responses
C. Cognitive appraisal
D. Facial Expression
Reviewing Key Perspectives
Common Sense View

Sight of oncoming car (perception of stimulus)

Fear (emotion)

Pounding heart (arousal)
Sight of oncoming car (perception of stimulus) → James-Lange Theory → Pounding heart (arousal) → Fear (emotion)
Sight of oncoming car (perception of stimulus)

Cannon-Bard Theory

Pounding heart (arousal)

Fear (emotion)
Key Aspects of Emotional Experience

A. Subjective experience
B. Physiological responses
C. Cognitive appraisal
D. Facial Expression
Expressed Emotion

- Culturally universal expressions
The polite “unfelt” smile

The Duchene smile

Review
Facial Feedback Hypothesis

- Attaching two golf tees to the face and making their tips touch causes the brow to furrow.
Key Aspects of Emotional Experience

A. Subjective experience
B. Physiological responses
C. Cognitive appraisal
D. Facial Expression
Event → Appraisal → Emotional response

Lazarus/Schachter-Singer

Zajonc/LeDoux

Review
Two routes, only one with complex cognition:

- **Low Road**: 
  - Short-cut enables instant fear response
  - Amygdala

- **High Road**: 
  - Thalamus
  - Visual cortex
  - Slightly slower interpretation: “This is a snake! Get away.”

**To pounding heart**
III. Cognition & Emotion

C. Schacter & Singer: Cognition-Arousal theory

1. Emotion is a function of both Arousal and Cognition
2. Both necessary

\[ E = f(A \ast C) \]
Sight of oncoming car (perception of stimulus)

Schachter's Two-Factor Theory

Pounding heart (arousal)

Cognitive label

"I'm afraid"

Fear (emotion)
2. Schacter’s infamous Study

a. "Suproxin" given as a drug to "improve vision"

b. While waiting for vision experiment, a “stooge” acted either irritated or euphoric

c. Subjects labeled their emotion as that which the stooge portrayed
Extending Schacter’s Perspective

D. Excitation transfer ("Spillover Effect")
   1. Arousal from one situation will be interpreted consistent with subsequent cues
   2. Shaky bridge experiment
Capilano Suspension Bridge
New Stuff Starts Here
Roller Coaster Study

For those riding with a nonromantic partner, ratings of attractiveness toward a photographed individual were higher among persons exiting than entering the ride.
Another example of excitation transfer…

- An arousal response to one event spills over into our response to the next event.

Arousal from a soccer match can fuel anger, which may lead to rioting.
Yet Another example?

Arousal from driving in traffic

Negative Cognitions & Actions
Cognition and Emotion

Cognition does not always precede emotion

Corrugator EMG to subliminal words

Arndt, Allen, & Greenberg, 2001
Segue from emotion .... to Lie Detection!

Premise is that lying is accompanied by emotion!
Your Opinion: Would you take a polygraph test if accused of something you did not do?

1. You bet – I’d want to clear things up and prove my innocence
2. Maybe, but it’d depend on whether I felt there were other ways to clear things up (e.g. alibi)
3. Unlikely, unless I felt I had few options
4. Not a chance!
Lie Detection Demo!!
Everything You Probably Should Know About “Lie Detection
## The Difficulty in Detecting Lying

<table>
<thead>
<tr>
<th>Observer Group</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secret Service</td>
<td>64.1</td>
</tr>
<tr>
<td>Federal Polygraphers</td>
<td>55.7</td>
</tr>
<tr>
<td>Robbery Investigators</td>
<td>55.8</td>
</tr>
<tr>
<td>Judges</td>
<td>56.7</td>
</tr>
<tr>
<td>Psychiatrists</td>
<td>57.6</td>
</tr>
<tr>
<td>Special Interest</td>
<td>55.4</td>
</tr>
<tr>
<td>College Students</td>
<td>52.8</td>
</tr>
</tbody>
</table>

*a chance = 50%*

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from Eckman & O'Sullivan, 1991
Spiel Overview

- Abbreviated history and overview of the conventional polygraph
- Limitations to conventional polygraphy
- Overview of alternatives: assessing recognition
• Polygraph invented in 1915 by Harvard-trained Ph.D., LL.B. William Moulton Marston

• Claimed it could detect lies by measuring blood pressure

• Not his main claim to fame
The Polygraph Test

- Fundamental assumption is that physiological responding:
  - differs when one is truthful versus being deceptive,

or

- demonstrates a specific physiological “lie response.”
Uses (and abuses) of Polygraph Tests

- Specific Incident Investigations
- Screening Situations
- Employee Polygraph Protection Act (EPPA; 1988)

- Expansion of Testing?
  - *National Defense Authorization Act* of 2000 requires scientists at nuclear weapons laboratories to submit to polygraph tests to maintain their security clearance
Instrumentation and Measures

Conventional Polygraphs

Each instrument comes with a one year warranty on all parts and labor. With each four- or five- pen instrument you will receive the following standard accessories: two pneu- matic chest assemblies, GSR electrode set, standard Korsch arm cuff, pump bulb assembly, pens and bottles for each recording module, one extra ink bottle, pen pad, ink filler, ink, tool kit, two rolls of chart paper and an instruction manual. Other optional accessories include auto power conversion, in-case calibrator, various styles of event markers and thermal writing capabilities.

The Statesman
Zero® case, the clean Halliburton lines are enhanced by the black marroccao grain finish. The case is high-impact thermo-formed ABS plastic to ensure durability. (Total weight: 21.5lbs. or 24.5lbs. with calibrator. Dimensions: 13"W x 21"L x 6.5"D).

The Factfinder II
The 10" chart drive allows five pens to be used simultaneously with greater pen swing. The practice of "pigeon tooting" the outside pens on a five- pen polygraph is no longer necessary and charts are easier to read because of reduced tracing overlap. This leaves plenty of room for important notations. Every Factfinder II maintains all of the quality and conveniences of our standard 8" chart drive models. Available only in a Statesman case, no thermal models are available.

The Courier II
Our newest conventional case style offers a gold anodized look and compact size. The case was designed with the traveling examiner in mind. The lid is designed with plenty of storage space and includes an in-case calibrator. The case is made of exceptionally strong, deep-drawn aluminum that resists dents and is also dust and weather resistant. (Total weight: 21.5lbs. Dimensions: 13"W x 18"L x 6.5"D).
EXHIBIT "B"
A CLASSIC "LYING" REACTION

THE POINT AT WHICH THE SUBJECT ANSWERED A RELEVANT QUESTION.
## Approaches to Detecting Deception

<table>
<thead>
<tr>
<th>Emotion/Arousal</th>
<th>Memory/Recognition</th>
<th>Other Cognitive Correlates</th>
</tr>
</thead>
<tbody>
<tr>
<td>“The” Polygraph</td>
<td>Guilty Knowledge Test</td>
<td>Response Conflict</td>
</tr>
<tr>
<td>Facial Expression</td>
<td>Autonomic (SCR)</td>
<td>Attention and Memory Load</td>
</tr>
<tr>
<td>Voice Stress</td>
<td>Central (ERP, fMRI?)</td>
<td>Both ERP and fMRI</td>
</tr>
<tr>
<td>Facial Blood Flow</td>
<td></td>
<td>Linguistic Analysis</td>
</tr>
<tr>
<td>Thermography</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demeanor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that none detect lying *per se*
None of these regions specific to lying
The Polygraph Measures

- Blood Pressure Changes
- Breathing movements
- Palmar Sweating (Electrodermal Changes)

But NOT Lying!
Control Question Test (CQT; John Reid, 1947) (for Specific Incidents Investigations)

- Approximately 10 questions

- Relevant Questions
  - address the subject matter under investigation

- Control Questions
  - questions developed by the examiner after a pretest interview with the subject
  - address generally questionable behavior

- At least 3 separate *charts* (i.e. 3 separate presentations of the set of questions) are administered

- The pretest interview stresses 2 ways to fail test, and that test is infallible
CQT “Theory” (Raskin, 1982)

- Innocent subjects should react with stronger emotion to the Control questions since their content are of greater direct concern.

- Guilty subjects should respond with stronger emotion to the Relevant questions.

- Comparing the magnitude of the responses (usually skin-resistance) to the control and relevant questions yield a verdict of Guilty, Innocent, or Indeterminate.
The Polygraph in Cases of Allegations of Inappropriate Contact
“CONTROL” TEST QUESTIONS

- Did you touch Susie between her legs?
- Have you found teen girls attractive?
- Have you been naked in sight of Susie?
- Have you lied to try to stay out of trouble?
- Have you viewed pornography?
- Have you fantasized sexually about Susie?

Relevant

“Control”
Hypothetically...

Innocent

- Respiration
- Perspiration
- Heart rate

Guilty

- Control question
- Relevant question

(a)

- Control question
- Relevant question

(b)
Polygrapher uses a global impressionistic decision-making strategy that incorporates:

- Case facts
- Examinee behaviors
- Polygraph Chart data
- Examiner's "professional" hunches and impressions
The Importance of Blind Scoring

- Expectancy Effects (the "60 Minutes study")
  - Three polygraph firms each examined four employees accused of theft of a camera (none actually stolen)
  - Without the knowledge of the employees, each polygrapher was told that a different employee was suspected by management
  - In each instance, the suspected employee was deemed guilty (probability by chance = 1.5%)
# The CQT Box Score

<table>
<thead>
<tr>
<th></th>
<th>% Correctly Classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Scientist's Research</td>
<td></td>
</tr>
<tr>
<td>Weighted Total</td>
<td>88%</td>
</tr>
<tr>
<td>Professional Polygrapher’s Research</td>
<td></td>
</tr>
<tr>
<td>Weighted Total</td>
<td>91%</td>
</tr>
</tbody>
</table>

* * *  
*after* Iacono & Patrick, 1997  
*Assessing deception: Polygraph techniques.*  
*In R. Rogers, Ed., Clinical Assessment of Malingering and Deception*  
*New York: Guilford.*
Why Using Confessions Overestimates Accuracy

- **In Fact Guilty**
  - **Passed Polygraph**
    - **No Confession**
      - Not Selected (False Negative) 0%
    - **Confession**
      - Selected (True Negative) 100%
  - **Failed Polygraph**
    - **No Confession**
      - Not Selected (Unverified True Positive) 0%
    - **Confession**
      - Selected (True Positive) 100%

- **In Fact Innocent**
  - **Passed Polygraph**
    - **No Confession**
      - Not Selected (False Positive) 0%
  - **Failed Polygraph**
    - **No Confession**
      - Not Selected (False Positive) 0%
Feedback Polygraphers Receive

In Fact Guilty

Passed Polygraph
- No Confession
  - Not Selected (False Negative) 0%

Failed Polygraph
- No Confession
  - Not Selected (Unverified True Positive) 0%
- Confession
  - Selected (True Positive) 100%

In Fact Innocent

Passed Polygraph
- Confession of another accused
  - Selected (True Negative) 100%

Failed Polygraph
- No Confession
  - Not Selected (False Positive) 0%

100% of those who confess failed the polygraph!

100% of those who are exonerrated by another person’s confession passed the polygraph!
Because these tests have much higher false positive rates than false negative rates, they should not be used in instances where most folks are innocent.

<table>
<thead>
<tr>
<th>Test Verdict</th>
<th>Actual</th>
<th>Guilty</th>
<th>Not Guilty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guilty</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Not Guilty</td>
<td>40</td>
<td>50</td>
<td>90</td>
</tr>
</tbody>
</table>

Total correct verdicts = 59%
Alternatives to Traditional Polygraph Procedures
The GKT as an alternative to Traditional Polygraph Procedures

- Guilty Knowledge Test (GKT)
  - Devised by Lykken (1959)
  - Sometimes termed Concealed Information Test (CIT)
Guilty Knowledge Test (GKT)

- The GKT does not assess lying as indexed by fear of being detected, but probes for guilt as indexed by recognition.
- A series of questions is devised, each having several alternatives, only one of which is true about the crime in question.
- Chances of an innocent person looking guilty on a 10-item GKT are $1/5^{10}$. 
Assessing Recognition: For Specific Incidents Investigations

- Used when information about a crime or event is available that only a real culprit would know.
- Series of questions constructed, only one of which has correct critical detail.

Regarding the abduction location, do you know for sure it was…
1. … at a Toy Store?
2. … at a Shopping Mall?
3. … at a City Park?
4. … at a Friend’s House?
5. … at School?
6. … at a Restaurant?

- Other questions about
  - Time abductee taken
  - Clothing worn
  - etc. for 6-10 questions

- Subject instructed to answer "no" to each item, so that if guilty, subject would be lying to the critical item.
- Critical item never positioned at beginning.
- A consistent peak of physiological response on the critical alternative suggests guilt.
## GKT Accuracy: Lab Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Percent Correct</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Guilty</td>
<td>Innocent</td>
</tr>
<tr>
<td>Lykken '59</td>
<td>98</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Davidson '68</td>
<td>48</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td>Podlesney '78</td>
<td>18</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>Balloun '79</td>
<td>34</td>
<td>61</td>
<td>88</td>
</tr>
<tr>
<td>Giesen '80</td>
<td>40</td>
<td>92</td>
<td>100</td>
</tr>
<tr>
<td>Bradley '81</td>
<td>192</td>
<td>59</td>
<td>89</td>
</tr>
<tr>
<td>Bradley '84</td>
<td>16</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Iacono '84</td>
<td>55</td>
<td>91</td>
<td>100</td>
</tr>
<tr>
<td>Steller '87</td>
<td>87</td>
<td>85</td>
<td>100</td>
</tr>
<tr>
<td>Iacono '92</td>
<td>71</td>
<td>87</td>
<td>71</td>
</tr>
<tr>
<td>O’Toole '94</td>
<td>45</td>
<td>77</td>
<td>94</td>
</tr>
<tr>
<td><strong>Study Median</strong></td>
<td></td>
<td><strong>88</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
GKT – Box Score, and Concerns

- Superior to CQT, especially in protecting the innocent
- Resistance to use among those in the polygraph community
  - Concern about applicability, especially in high profile cases
  - But used successfully by Japanese police force
- Despite limitations of CQT, may have utility for eliciting confessions
Take Home Message

- There is no unequivocal lie response
- Traditional Polygraphy, which focuses on emotional reactions, suffers from an unacceptably high false positive rate (innocent folks look guilty)
- Assessing recognition may prove more accurate, but possibly less widely applicable
- Polygraphs are useful for eliciting admissions and confessions; i.e. “scare the hell out of people”

Spiel over – know this!
Your Opinion: Would you take a polygraph test if accused of something you did not do?

1. You bet – I’d want to clear things up and prove my innocence
2. Maybe, but it’d depend on whether I felt there were other ways to clear things up (e.g. alibi)
3. Unlikely, unless my I felt I had few options
4. Not a chance!
Cognition & Emotion

E. Cognition in depression

1. Distorted cognitions create depression
2. Cognitive distortions (or errors)
   a. Overgeneralization
   b. Selective abstraction
   c. Magnification & Minimization
   d. All or Nothing thinking
3. Therapy: Changing cognitions changes emotions
4. Sadder but Wiser phenomenon
Press Button A or Button B.

After each press…
   Light Turns on (Win 25 cents)
or
   Light remains dim (No Win)

"How much control did you have?"

No relationship between button pushed and winning!
Nondepressed people may suffer either from illusions of control or noncontrol, depending on the circumstances. These illusions help them to see themselves and their world with a "rosy glow" and may help them persist when things go wrong.