TECH 646 Analysis of Research in Industry and Technology

Observation Studies

Lecture note based on the Ch. 8 of the text book and supplemental materials:

Cooper, D.R., & Schindler, P.S., *Business Research Methods* (12th edition), McGraw-Hill/Irwin

Paul I-Hai Lin, Professor
http://www.etcs.pfw.edu/~lin
A Core Course for Master of Science in Technology Graduate Program
Purdue University Fort Wayne

Observation Study – Learning Objectives

Understand …

1. When observation studies are most useful.
2. Distinctions between monitoring non-behavioral and behavioral activities.
3. Strengths of the observation approach in research design.
4. Weaknesses of the observation approach in research design.

Observation Study – Learning Objectives

Understand …

5. The three perspectives from which the observer-participant relationship may be viewed in observation studies.
6. The various designs of observation studies.

Pull Quote

- "Today, scores of built-in sensors in **Formula One cars** continuously capture a multiplicity of variables—including RPMS, weather, road conditions, the angles on a track's s-bends, wear on tires, to pit stop now or next lap—and process it into data for active simulation models that inform a drivers' instantaneous decisions. Formula One racing today is as much about deriving Continuous Intelligence and decision-making as it is about engine speed and driving expertise."

John Chen, *CEO, Sybase*

PulsePoint: Research Revelation

- **The statistics – how to obtain this finding with different types of observation studies.**
- **Banks**
  - **Pushing customers online**
  - **How would you create an observation study to confirm it?**

101

The number, in millions, of adult Internet users who will bank online by 2011.

Observation Study – Garbologist – Talkin Trash

Observation Study at University of Arizona in Tucson,

- It began in 1973 and continued until the recent retirement of its founder Dr. William Rathje.
- If you manufactured packaging materials for food and personal care products, how might you use what the researchers have learned?
- See **https://vimeo.com/31570247**

The Uses of Observation

- Much of what we know comes from observation: smell, see, taste, events, attitudes, feelings …
- Observation qualifies as a scientific inquiry when it:
  - Is conducted specifically to answer a research question
  - Is systematically planned and executed
  - Uses proper controls
  - Provides a reliable and valid account of what happened.

Data Collection

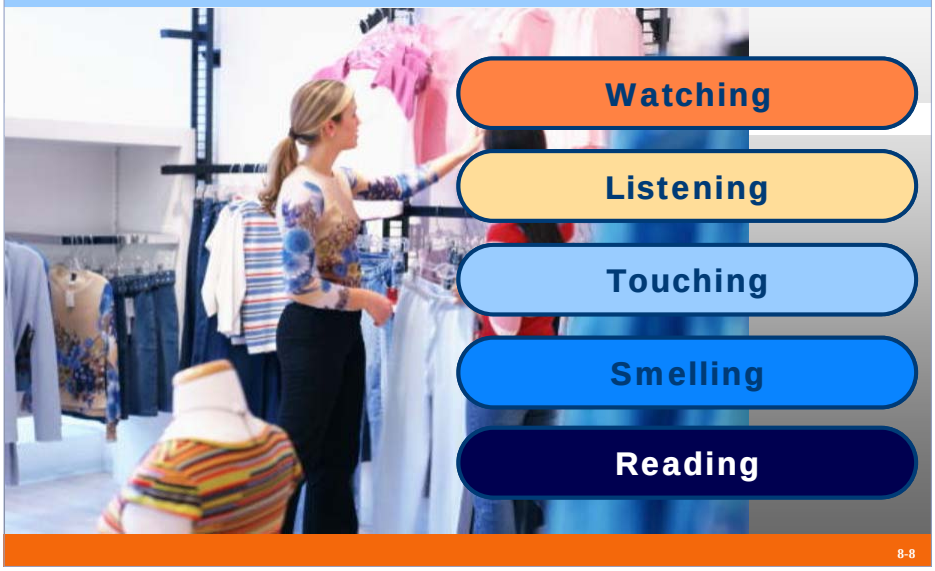
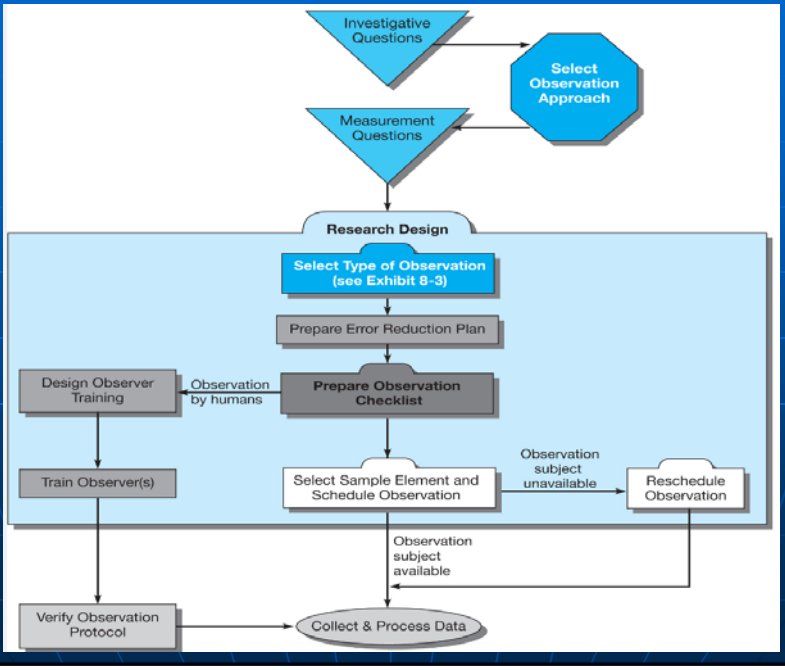
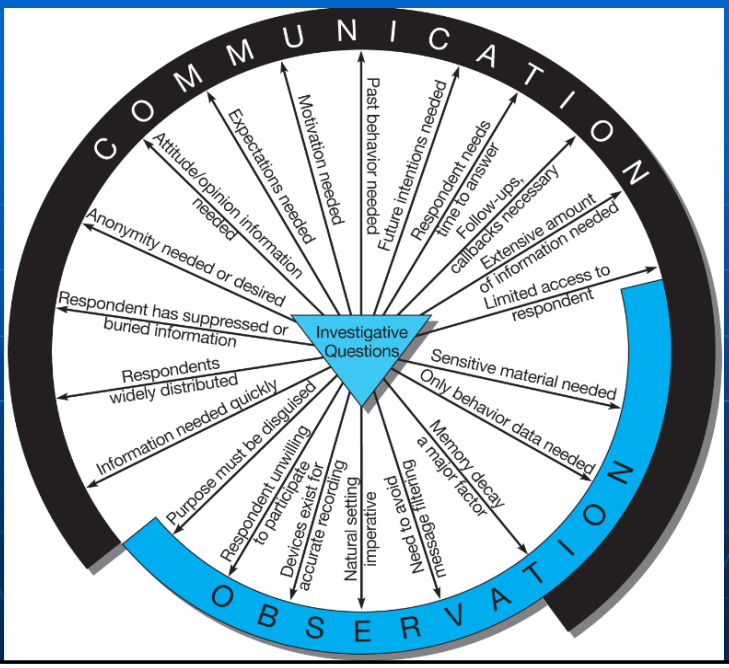


Exhibit 8-1: Observation and the Research Process



9

Exhibit 8-2 Selecting the Data Collection Method



10

Observation Classification

Nonbehavioral	Behavioral
• Physical condition analysis • Process or Activity analysis • Record analysis	• Nonverbal • Linguistic • Extralinguistic • Spatial

Non-Behavior Observation

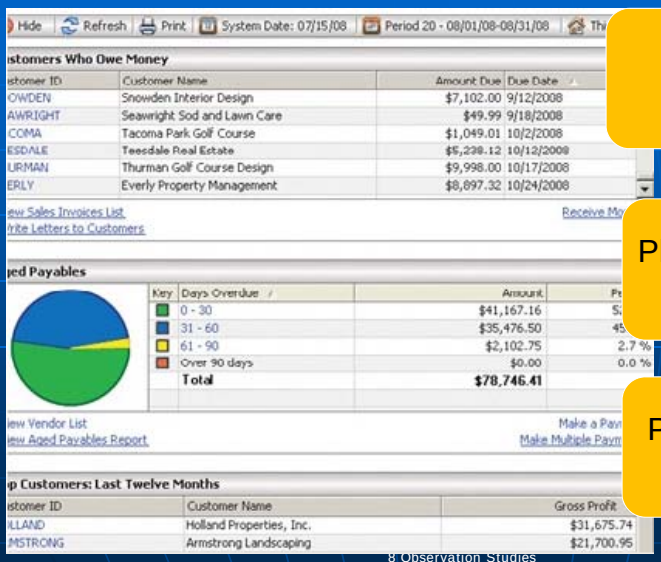
Physical Condition Analysis Examples

- Study of plant safety compliance
- Analysis of inventory conditions
- Analysis of financial statements

Process or Activity Analysis Examples

- Time/motion studies of manufacturing processes
- Analysis of traffic flows in a distribution system
- Paperwork flows in an office
- Financial flows in the banking systems

Nonbehavioral Observation

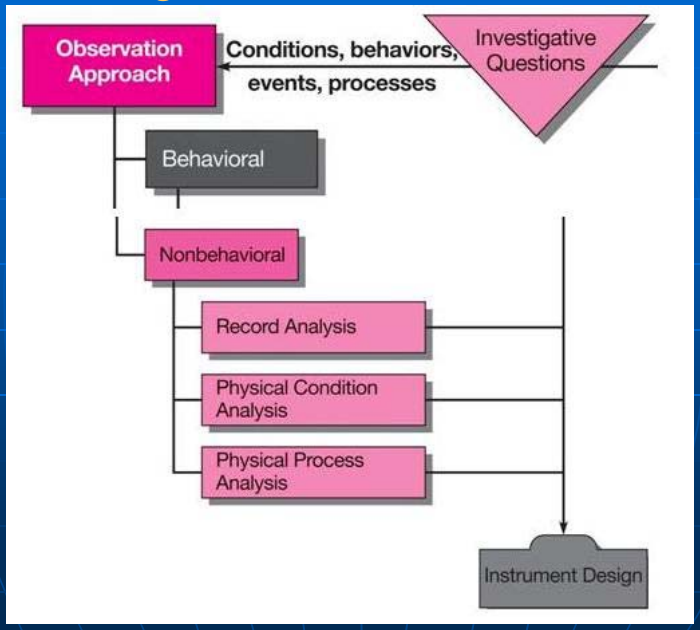


Record Analysis

Physical Condition Analysis

Physical Process Analysis

Selecting - Nonbehaviroal Observation



Investigative Questions

Observation

- Purpose must be disguised
- Respondent unwilling to participate
- Devices exists for accurate recording
- Natural setting imperative
- Need to avoid message filtering
- Only behavior data needed
- Sensitive material needed

Investigative Questions

Communication

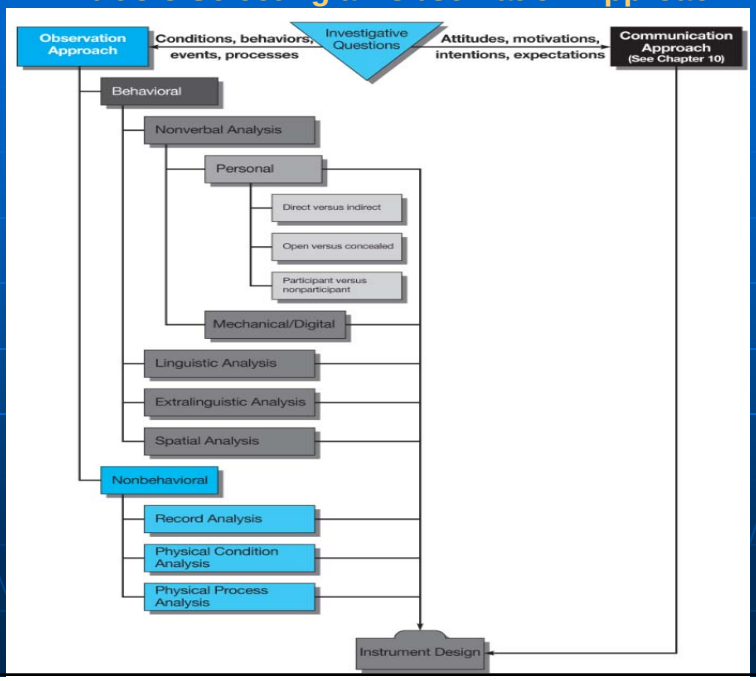
- Information needed quickly
- Respondents widely distributed
- Respondent has suppressed or buried information
- Anonymity has suppressed or buried information
- Attitude/opinion information needed
- Expectation needed
- …

Investigative Questions

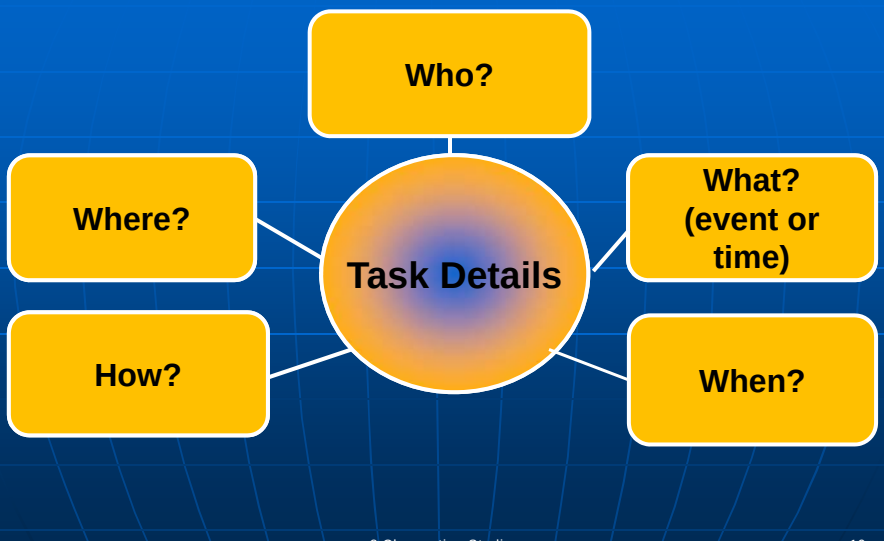
Communication (cont.)

- Motivation needed
- Past behavior needed
- Future intention needed
- Respondent needs time to answer
- Follows-ups, callbacks necessary
- Extensive amount of information needed
- Limited access to respondent

Exhibit 8-3 Selecting an Observation Approach



Evaluation of the Observation Method
Research Design – Data Collection

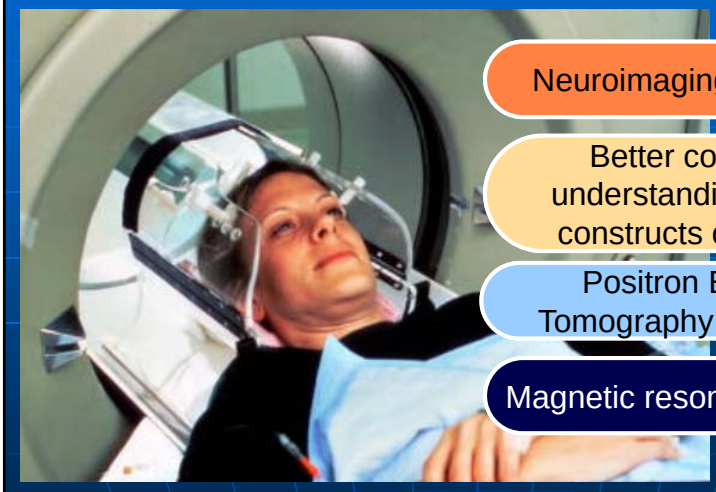


Using Observation

Observation Location

- The Lexus and agency Team One Advertising used **Observation** during the NY auto show

Snapshot: The Cutting Edge of Research Technology or a Black Box?



- Neuroimaging techniques
- Better conceptual understanding of latent constructs of behavior
- Positron Emission Tomography (PET) scan
- Magnetic resonance imaging

Exhibit 8-6 Content of Observation

Factual	Inferential
Introduction/identification of salesperson and customer.	Credibility of salesperson. Qualified status of customer.
Time and day of week.	Convenience for the customer. Welcoming attitude of the customer
Product presented.	Customer interest in product.
Selling points presented per product.	Customer acceptance of selling points of product.
Number of customer objections raised per product.	Customer concerns about features and benefits.
Salesperson's rebuttal of objection.	Effectiveness of salesperson's rebuttal attempts.
Salesperson's attempt to restore controls.	Effectiveness of salesperson's control attempt. Consequences for customer who prefers interaction.
Length of interview.	Customer's/salesperson's degree of enthusiasm for the interview.
Environmental factors interfering with the interview.	Level of distraction for the customer.
Customer purchase decision.	General evaluation of sale presentation skill.

Wal-Mart Implements Use of RFID Labels

Nonbehaviroal Observation

- RFID (Radio Frequency Identification Tag)
  - Tracking product related info, Inventory, Location of customers, When a product is actually used

"We can certainly understand and appreciate consumer concern about privacy. That's why we want our customers to know that RFID tags will not contain nor collect any additional data about our customers. In fact in the foreseeable future, there won't even be any RFID readers on our stores' main sales floors."

Linda Dillman
EVP & Chief Information Officer
Wal-Mart

Systematic Observation

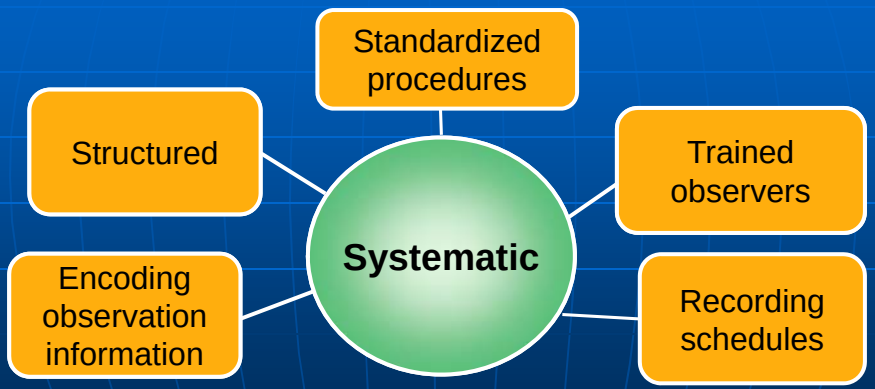
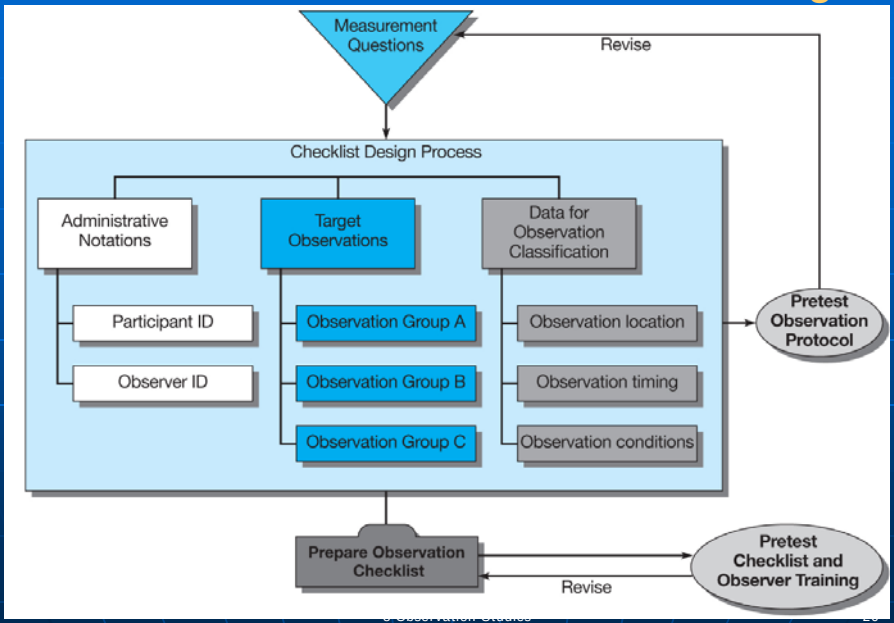
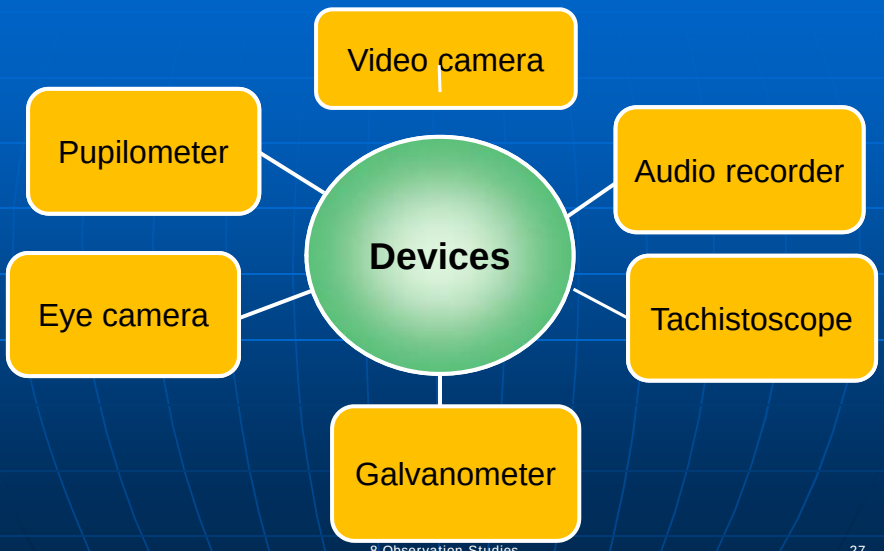


Exhibit 8-5 Flowchart for Checklist Design



Mechanical/Digital Behavioral Observation



Observer-Participant Relationship

- Three Perspectives
  - Direct vs. indirect observation
  - Presence is known vs. unknown
  - Observer involved vs. not involved in events

Extra linguistic Observation

- Vocal
- Temporal
- Interaction
- Verbal Stylistic

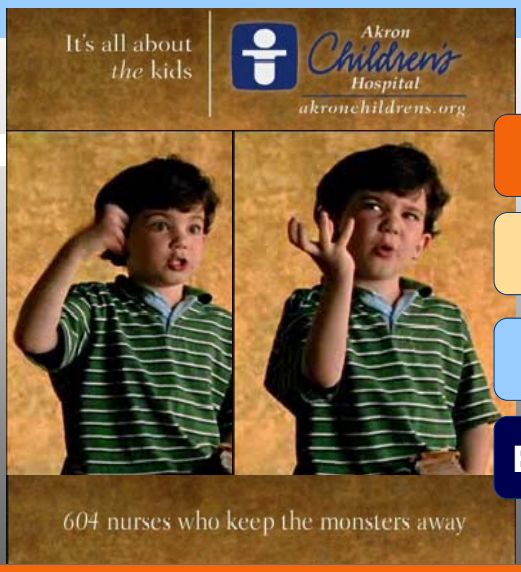
8-29

Extra linguistic Observation

- Vocal
- Temporal
- Interaction
- Verbal Stylistic

8-30

Desired Characteristics for Observers



- Concentration
- Detail-oriented
- Unobtrusive
- Experience level

8-31

Errors Introduced by Observers

- Halo Effect
- Observer Drift

8-32

Evaluation of Behavioral Observation

Strengths

- Securing information that is otherwise unavailable
- Avoiding participant filtering/ forgetting
- Securing environmental context
- Optimizing naturalness
- Reducing obtrusiveness

Weaknesses

- Enduring long periods
- Incurring higher expenses
- Having lower reliability of inferences
- Quantifying data
- Keeping large records
- Being limited on knowledge of cognitive processes

PicProfile: BestBuy Redesign

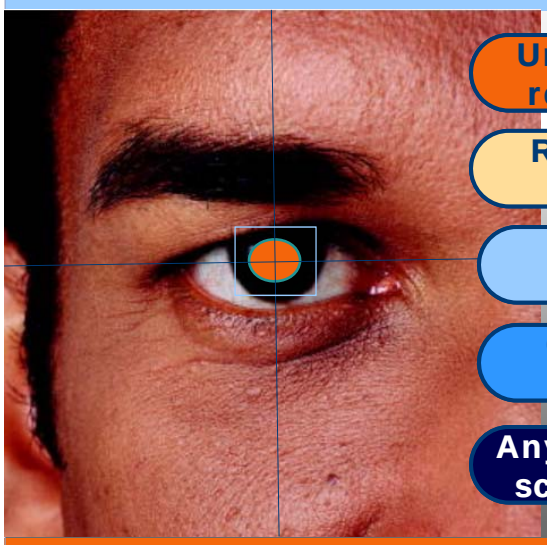
Store associates as observers

Eastern European ship workers as subjects

Display relocation

Increased sales

Snapshot: Eyes Have It



- Understand peoples' reactions to stimuli
- Reveal the see-say gap
- No lab needed
- Calibrated to your computer
- Anything presented on screen can be tested

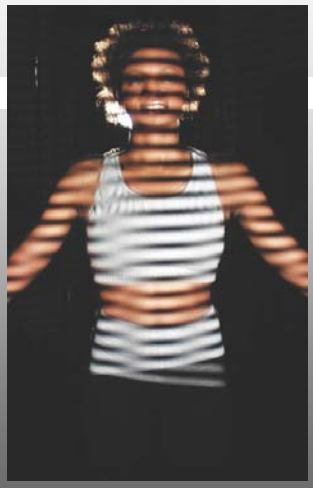
8-35

Snapshot: Physicians and Patients

- Reveal core emotional experiences
- Reveal motivations for parents' decisions
- Video & audio observation
- Respect sensitivity of subject & environment
- Obtain parent consent

8-36

SizeUSA



Body Measurement System

8-37

Portable People Meters

8-38

SUMMARY