HCI and Design

SPRING 2016

Topics for today

- Have you all submitted your project proposals?

- Ethics
- Bias

What are ethics?

The study of moral standards and how they affect conduct

Moral standards are …

- A system of principles governing the appropriate conduct of an individual

Ethics ask us to live “mindfully”

ACM Code of Ethics

General Moral Imperatives

1. Contribute to society and human well-being
2. Avoid harm to others
3. Be honest and trustworthy
4. Be fair and take action not to discriminate
5. Honor property rights including copywrites and patents
6. Give proper credit for intellectual property
7. Respect the privacy of others
8. Honor confidentiality

More Specific Professional Responsibilities

Strive to achieve the highest quality, effectiveness, and dignity in both the process and products of professional work

1. Acquire and maintain professional competence
2. Know and respect existing laws pertaining to professional work
3. Accept and provide appropriate professional review
4. Give comprehensive and thorough evaluations for computer systems and their impacts, including analysis of possible risks
5. Honor contracts agreements, and assigned responsibilities
6. Improve public understanding of computing and its consequences
7. Access computing and communication resources only when authorized to do so

Why should you care about ethics?

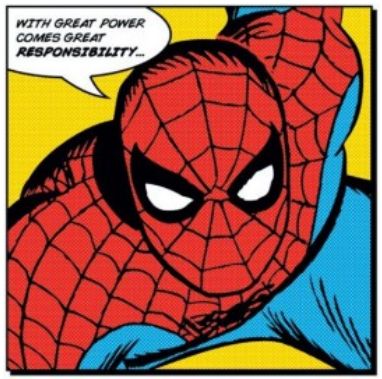
As designers, engineers, researchers you have great power

- People will believe that you are an expert
- People will do what you tell them

People will blame themselves

- For errors, mistakes
- When things go wrong
- For not giving you the results you want
- Participants might be reduced to tears, or worse…

With great power comes great responsibility



Milgram experiment

Psychology experiment at Yale

Prof. Stanley Milgram

Study of obedience, willingness to obey authority (1963)

- Connection to WW2

Public Announcement

WE WILL PAY YOU $4.00 FOR ONE HOUR OF YOUR TIME

Persons Needed for a Study of Memory

*We will pay five hundred New Haven men to help us complete a scientific study of memory and learning. The study is being done at Yale University.

*Each person who participates will be paid $4.00 (plus 50c carfare) for approximately 1 hour's time. We need you for only one hour: there are no further obligations. You may choose the time you would like to come (evenings, weekdays, or weekends).

*No special training, education, or experience is needed. We want:

Factory workers	Businessmen	Construction workers
City employees	Clerks	Salespeople
Laborers	Professional people	White-collar workers
Barbers	Telephone workers	Others

All persons must be between the ages of 20 and 50. High school and college students cannot be used.

*If you meet these qualifications, fill out the coupon below and mail it now to Professor Stanley Milgram, Department of Psychology, Yale University, New Haven. You will be notified later of the specific time and place of the study. We reserve the right to decline any application.

*You will be paid $4.00 (plus 50c carfare) as soon as you arrive at the laboratory.

TO:
PROF. STANLEY MILGRAM, DEPARTMENT OF PSYCHOLOGY, YALE UNIVERSITY, NEW HAVEN, CONN. I want to take part in this study of memory and learning. I am between the ages of 20 and 50. I will be paid $4.00 (plus 50c carfare) if I participate.

NAME (Please Print). . . . . .

ADDRESS . . . . . .

TELEPHONE NO. . . . . Best time to call you . . . . . .

AGE . . . . . OCCUPATION . . . . . SEX . . . . . .
CAN YOU COME:

WEEKDAYS . . . . . EVENINGS . . . . . WEEKENDS . . . . . .

Milgram experiment

3 roles:

Teacher (Participant)

Learner

Experimenter (Professor)

Teacher & learner in separated rooms

- Able to communicate, but not see each other

Teacher read word pairs, learner had to remember them

- If answer incorrect teacher had to administer electric shock to learner
- Teacher received real electric shock as proof

Milgram experiment

Teacher believed that learner received shocks (15V-400V)

BUT in reality:

- No shocks
- Not the learner who responded
  - Tape recorder integrated in the electro-shock generator

Experiment only stopped if:

- Teacher (really) wished to stop
- After giving 450 V three times (potentially lethal)

Milgram experiment

26 out of 40 (65%) of participants administered final 450 V shock (potentially lethal!)

Only 5 stopped before 300 volts

Even if teachers wanted to stop, only a few had resources to resist authority (experimenter)

None of the teachers who wanted to stop:

- Insisted that experiment should be terminated
- Checked learner´s health

Milgram experiment

- Very stressful for participants
  - Often protested, but still obeyed
  - Milgram: “There were powerful reactions of tension and emotional strain in a substantial proportion of the participants. Persons were observed to sweat, tremble, stutter, bite their lips…”
  - Ordinary people can become agents in a terrible destructive process (go watch / read about the Stanford prison experiment)



Milgram experiment

Many have questioned the ethics of the study

- Milgram defended his work
  - Participants were debriefed
  - Many reported positive experiences
  - Claimed benefits outweighed any harm

What do you think?

What ethical issues might you face?

- People will do what you tell them to do!

- The boss asks you to create an app that will violate people's privacy.
- You need to stop supporting a service that people have become dependent on.
- You're tempted to cut corners in design/testing to save money.
- You don't have permission to collect people's data but you do it anyway
  - Or trick them into giving you permission
- etc.

What ethical issues might you face?

- Thorough design
- Robust implementation
- Honesty in advertising
- Thorough risk analysis
- Thorough testing
- Proper training

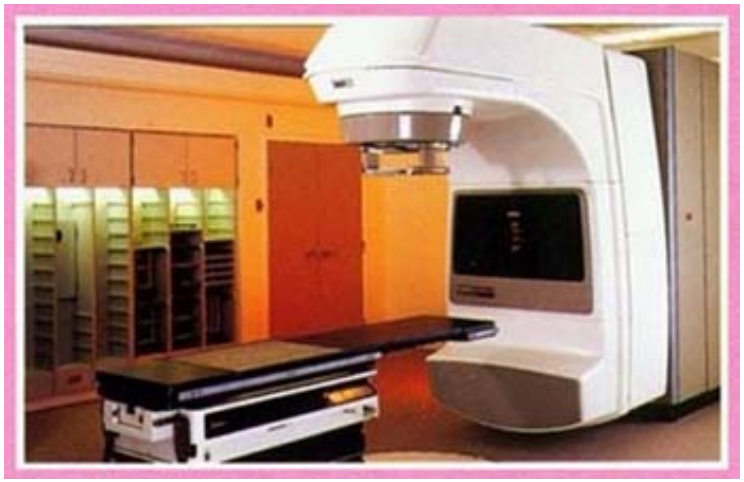
- Wait… how can design be an ethical issue?

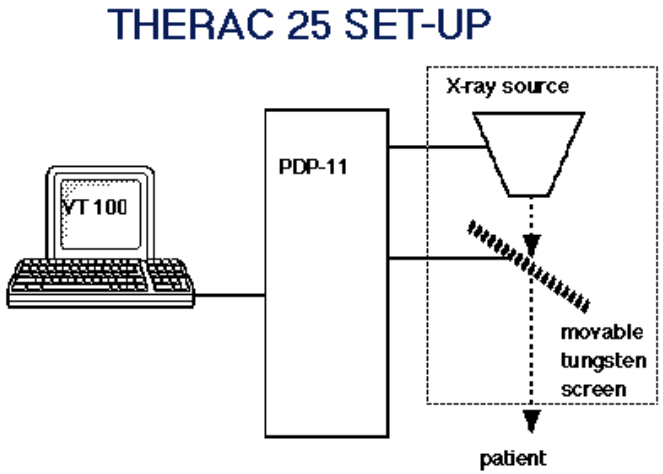
Example: Therac-25

Linear accelerator to deliver x-rays and electron beams for the treatment of cancer

Released in 1985

Third generation machine (Therac-6, Therac-20)





Therac-25: what happened?

- Normal radiation treatments: 6,000 rads over a 3 week period
- Under certain conditions Therac-25 was delivering 60,000 rads during one session.

Accidents

3 June 1985 – patient in Marietta GA received overdose

26 July 1985 – patient in Hamilton ONT severely burned. Died Nov 1985

December 1985 – patient in Yakima WA receives overdose

21 March 1986 – Tyler TX accident, patient died later

11 March 1986 – second Tyler accident, patient died 1 month later

17 January 1987 – Second Yakima WA accident

Therac-25: what went wrong?

Paradigm Shift

- Therac-25 replaced expensive hardware safety interlocks with software controls

Design

- Race condition caused focusing element to be incorrectly set
- No indication of actual hardware settings
- Error messages appeared the same regardless of how important
- Error messages were difficult to understand
- All error messages could be manually overridden

Therac-25: what went wrong?

Lack of experience and overconfidence in software controls

No user involvement in design or testing

Insufficient testing

Poor error messages

Lack of visibility of hardware settings

Lack of constraints

Affordance of overrides

Poor documentation

Summary of ethics

As designers, engineers, researchers you have great power

- People will do what you tell them

People will blame themselves

- For errors, mistakes
- When things go wrong
- For not giving you the results you want
- Participants might be reduced to tears, or worse…

With great power comes great responsibility

- IRB, ethics review, etc. helps but is only part of the story
- It's up to you to be responsible for your own conduct

Bias

What is bias?

Prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair.

- Expressed directly: “I like rich people more than poor people.”
- Expressed indirectly: E.g., Sitting further away from a poor person than a rich person.

Types of bias

- **Explicit**
  - Person is aware of his/her evaluation
  - Conscious bias
- **Implicit**
  - Person doesn't perceive or endorse evaluation
  - Subconscious bias
- **Sure, other people are biased, but not me…**
  - Lots of evidence that shows ALL people are biased, at least subconsciously
  - Even against their own group. i.e. women are biased against women, black people are biased against black people, etc.

Types of bias you should think about

Selection bias

Social desirability bias

Demand characteristics

Evaluator/Interviewer bias

Acquiescing

Extreme responding

…

Other subconscious biases

Selection bias

Selection of individuals, groups or data in a way that proper randomization is not achieved.

The sample obtained is not representative of the population intended to be analyzed.

e.g., most psychology experiments done with “WEIRD” people

- Western, educated, industrialized, rich and democratic
  - (i.e. US college students)
- Not representative of the entire world / population

Selection bias - examples

Online surveys on a website

- e.g. a website devoted to preventing harassment of women concluded that nearly all women were victims of harassment.

Online Reviews of restaurants, films, etc.

- May be biased towards negative because people are more likely to rant after having a bad time than they are to rave after a good or adequate time.

Self selection

- People who choose to participate are likely to be people who are already invested

Social desirability bias

Broadly conceived, 'social desirability' as a response determinant refers to the tendency of people to deny socially undesirable traits or qualities and to admit to socially desirable ones. Phillips and Clancy (1972)

Lots of research that shows:

- people will say they voted when they haven't
- will inflate their reported incomes
- will describe themselves in socially-sanctioned ways (such as saying they are happier than they are in their marriages)
- will edit politically "incorrect" responses (such as prejudice)
- etc.

Demand characteristics

Subtle cues that make participants aware of what the experimenter expects to find or how participants are expected to behave.

Participants alter their behavior to conform to expectations.

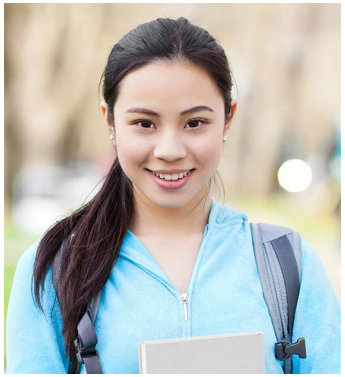
- People want to be “good participants”.
- People want to “help” the researcher.
- People want to contribute to research, science, society, etc.

Even if you try to hide the purpose of a study, people will guess the purpose and conform to what they guessed.

Interviewer bias

Results/data varies depending on the interviewer.





Variations in both how participants AND interviewers behave.

Acquiescing and extreme responding

Acquiescing: tendency to agree with all the questions.

- People like to be agreeable.
- Especially prevalent if survey/interview questions are "leading".
- *Did you have an enjoyable experience?*
- *Would you recommend my product to others?*

Extreme Responding: tendency to select most extreme options.

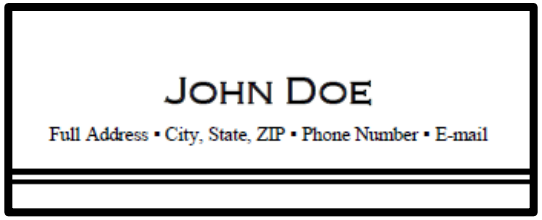
- General indifference
- Willingness to please
- Poor question wording

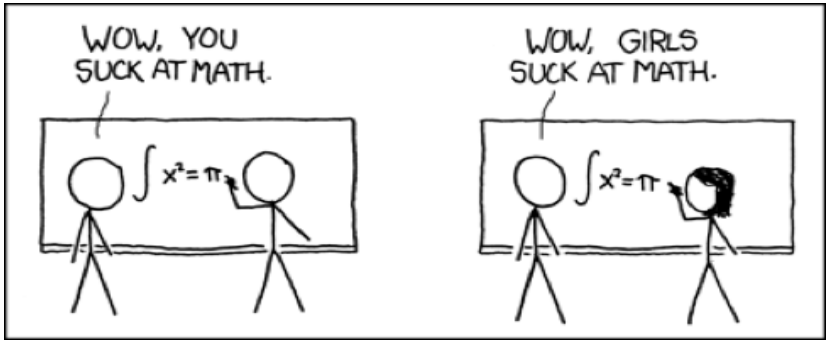
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
(1)	(2)	(3)	(4)	(5)

Other subconscious biases

Many… (perceived) wealth, education, tallness, etc.

- Race
- Gender





Subconscious bias affects **everything**, e.g.,

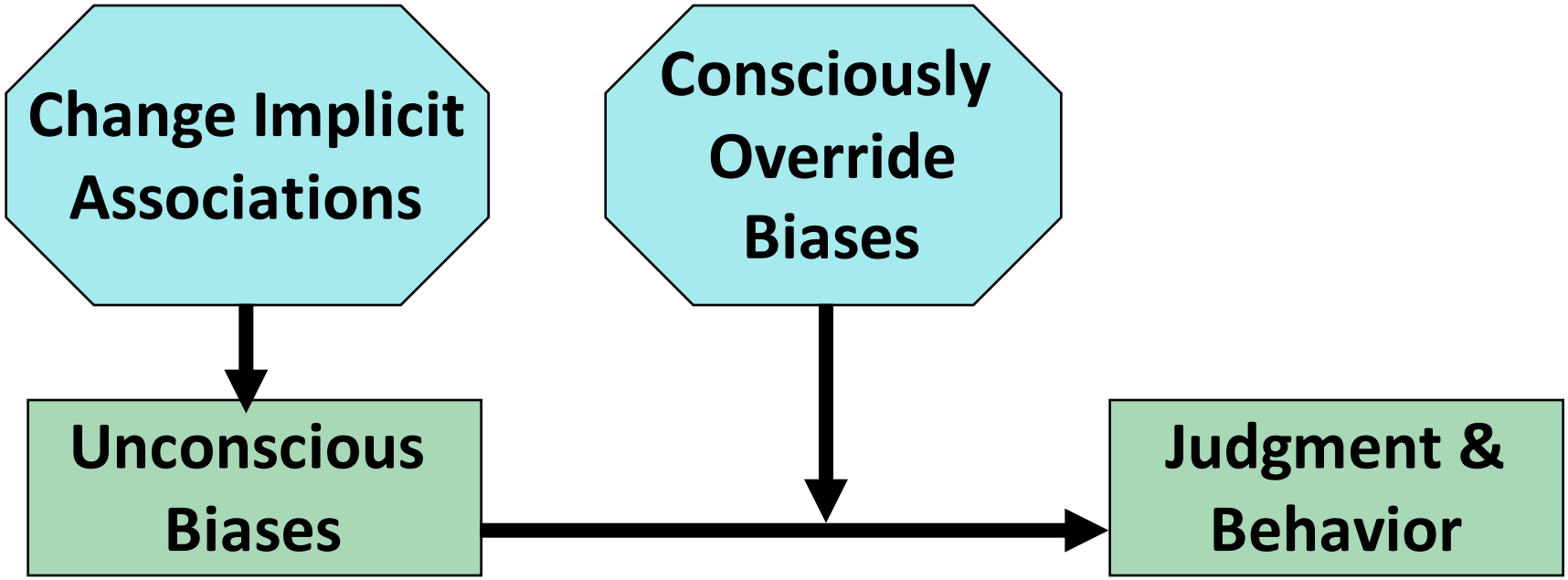
- Jobs, employment, recruiting, salary
- Course evaluations, performance evaluations
- Negotiations – mortgages, car sales, etc.
- Law enforcement
- And so on…

What can you do about bias?

So, you can't believe anything that participants say.

- Should you just give up?

A Two Strategy Solution



1. Overriding Unconscious Bias

Be **aware** of the potential for bias

Be **motivated** to control bias

Take the **time** to consider individual characteristics and avoid stereotyped evaluations

Examples: when writing evaluations, avoid:

Using first names for women or minority faculty and titles for men *Joan* was an asset to our dept." –vs.- "*Dr. Smith* was an asset..."

Gendered adjectives: "Dr. Sarah Gray is *caring, compassionate*" –vs.– Dr. Joel Gray has been very *successful*"

Potentially negative language: "S/he requires only minimal supervision" or "S/he is totally intolerant of shoddy research"

Faint praise: "S/he worked hard on projects that s/he was assigned" or "S/he has never had temper tantrums"

Unnecessarily invoking a stereotype: "She is not overly emotional"; or "S/he is extremely productive, especially as someone who attended inner city schools and a large state university"

2. Change implicit assumptions

Education

- Seminars and classes on implicit bias
- Media articles
- Books
  - e.g., Blink, Thinking Fast and Slow

Exposure

- Hang out with people different from you
- Attend and promote diversity events
- Make sure your teams etc. are diverse
- etc.

Take-Away Points

Implicit bias is distinct from conscious motivation

We all have these biases due to cultural exposure

They can affect behavior: we need to work to override them

They can be changed over time with education and exposure

Most important: Recognize and accept that you (and everyone) are biased! Pay attention to when bias may affect your life, work, choices, etc.

Next time…

- Design theory… I think… hopefully