Why study it?

It helps us understand human collaboration, which is one of the most difficult areas of HCI.

Mere presence effects

Simply being near others can lead to changed performance, e.g. Triplett's fishing observations.

How would fishermen in a group perform differently from individuals?

Mere presence effects

A: They catch more fish per fisherman!

But specifically, which aspects of performance change?

Mere presence

Stress, anxiety or stimulation increase physiological arousal, and arousal speeds up behavior.

The presence of others pushes these buttons...

But increased speed can also increase errors, so it can be bad on difficult tasks.

Mere presence

Increased arousal generally helps learning

But, it also heightens response to well-learned stimuli (Zajonic and Sales):

It says "alpha helix"
Mere presence

- Mere presence isn't quite the right idea.

- The presence of a blindfolded subject didn't increase arousal, and didn't affect performance.

- The presence of others evaluating or competing with us is what matters.

Mere presence - Design Implications

- Increasing the level of group “awareness” should increase mere presence effects:
  - Heightened arousal
  - Faster performance
  - Increased learning
  - More errors

- Examples:
  - High awareness - video conferencing, phone
  - Medium - Instant messaging
  - Low awareness - Email

Mere presence - Design Implications

- What would be a good medium for:
  - Routine discussions?
  - Brainstorming?
  - Working on difficult tasks, e.g. programming?

Attribution

- How do we attach meaning to other’s behavior, or our own?

- This is called attribution.

- E.g. is someone angry because something bad happened, or because they are hot-tempered?

Attribution: ourselves

- Lets start with ourselves, how good are we at figuring out our emotions?

- Schacter: it depends strongly on environmental and physiological factors, and others near us.

- The bottom line is that we can feel strong emotion, but struggle to recognize it as happiness or anger.

Attribution theory

- Attribution theory: was this behavior caused by personality, or environment?

- Fundamental attribution error:
  - When I explain my own behavior, I rely on external explanations.
  - When I explain others’ behavior, I’m more likely to attribute it to personality and disposition.
  - E.g. other drivers are either “lunatics” (faster than me) or “losers” (slower than me). Of course, they have the same model about you ☺
Attribution theory

How should you design communication systems to minimize attribution errors?

11/8/2004

Attribution theory – design implications

To reduce attribution errors, it's important to have as much context as possible.

E.g. room-scale video-conferencing, or ambient displays:

11/8/2004

Social Comparison

We need to make comparisons to make judgments about people. Three rules:

* Limitation: qualities must be observable and comparable to be attributed.
* Organization: we use categories to describe and think about people: friendly, studious, careless etc.
* Meaning: categories of personality must make sense, e.g. friendly and cooperative go together, friendly and hostile do not.

11/8/2004

Groups

Groups are a strong influence on our behavior.

A "reference" group is one we share a psychological connection with, e.g. a club or honor society we aspire to join.

We compare ourselves to reference groups to make self-assessments.

11/8/2004

Groups

Groups give us value in several ways:

They provide us norms for behavior (informational function)

They satisfy interpersonal needs (interpersonal function)

They provide us with concrete support, resources, help (material function)

11/8/2004

Groups and Motivation

Groups increase motivation in two ways

First, the social interaction with the group intensifies individual motivation, and sometimes generates new individual motives.

Second, the group can cause group goals and motives to be created. E.g. group maintenance is goal most groups have.

11/8/2004
**Group goals**

- Goals can be either short-term or long-term.
- Long-term goals are harder to manage and maintain and generally have less effect on group behavior.
- Short-term goals are strong force in motivating and reinforcing group performance.

**Group experiences**

- Previous experience affects goal-setting.
- Groups that have succeeded are more likely to raise goals, groups that have failed are unlikely to lower them.

**Group experiences - Design implications**

- Normative data can be very helpful - how am I doing compared to a typical colleague?
  * Compute normative data automatically
- Set short-term goals, mark off successes - challenge to do this efficiently
  * PERT charts or Calendars
  * Daily software builds
  * Extreme programming

**Summary**

- Mere presence influences speed of performance, through evaluation and competition.
- Attributions of behavior causes have an actor-observer effect.
- Social comparison is how we make judgements.
- Groups influence our perception of self and others through norms (reference groups).
- Groups influence behavior as well.

**Break**
The Psychology of Creativity

Conformity: the enemy of creativity

Organizations encourage conformity: IBM, Disney etc. part of "corporate identity".
* Note: IBM research and many other research labs reject their corporation's mainstream culture.

Conformity: the enemy of creativity

Pressure to conform affects judgment and perception:
* The emperor’s new clothes
* People in the minority will adopt majority opinion and even manufacture their own explanation of it.

Enhancing Creativity

Thinking outside the box (literally):

Draw a series of 4 straight lines through all the points below, without lifting pen from paper:

Why is this hard

Even without being told, we adopt expectations about what the solution should look like.

Based on conventions, and also what we believe the questioner expects.

Creativity and Groups

Since groups create pressure to conform, they often hamper creativity.
* This is called “groupthink”.
* Groups are usually less creative than the individuals.
* Email increases participation and reduces the effect of groupthink.

This contradicts our best experiences of group work.

What is missing?

Creativity and Dissent

Authentic dissenters – people who really disagree with the group – can enhance group creativity.

Their opinion needn’t be right – but they can free the group from stagnant thinking.

The originality of the minority stimulates the majority.
Dissent and authenticity

- The benefits of dissent are weakened if either:
  - The dissent is not real, but is enacted: such as by a deliberate "devil's advocate" in the group.
    (The devil's advocate can actually stifle dissent, because the majority know their opinion is manufactured.)
  - The group does not encourage dissent. Polite or pro-forma acceptance is not enough.

Brainstorming

- Based on IDEO's principles
  - world's best known Design firm.

Brainstorming Rules

1. Sharpen the Focus
2. Playful Rules
3. Number your Ideas
4. Build and Jump
5. The Space Remembers
6. Stretch Your Mental Muscles
7. Get Physical

Sharpen the Focus

- Posing the right problem is critical – neither too narrow, nor too fuzzy
- Not "bicycle cup-holders" but "helping cyclists to drink coffee without accidents".
- Focus outward (on the user's needs) not on the company's strengths.

Playful Rules

- Rules constrain choice and inhibit exploration.
- Making the rules playful or ironical can shape the discussion without limiting it.
- Examples: "encourage wild ideas," "be visual," "go for quantity."

Number your ideas

- Obvious but very useful
- Helps keep track of them when the brainstormer is successful (and a hundred or more ideas are in play).
- Allows ideas to take on an identity of their own.
Build and Jump

- Build to keep momentum on an idea:
  * “shock absorbers are a great idea; what are other ways to reduce coffee spillage on bumps?”

- Jump to regain momentum when a theme tapers out:
  * “OK, but what about hands-free solutions?”

The Space Remembers

- Covering whiteboards or papering walls with text is extremely useful in group work.

- It’s a very effective form of external (RAM!) memory for group members.

- Even better, its shared RAM, It’s a way for group members to share understanding.

Stretch your Mental Muscles

- Warmups: word games, puzzles

- Get immersed in the domain: go visit the toy shop, or the bicycle shop, phone shop etc...

- Bring some examples of the technology to the brainstomer.

Get Physical

- Do as well as talk.

- Sketching.

- Making models.

- Acting out.

Ways to kill a brainstormer

1. The boss gets to speak first
2. Everybody gets a turn
3. Experts only
4. Do it offsite
5. No silly stuff
6. Write down everything

Summary

- Principles of creativity:
- Groupthink ↔ dissent
- Brainstorming: rules to discourage groupthink, and encourage divergent thought.