Emotions

Robert Plutchik's theory

Robert Plutchik's theory says that the eight basic emotions are:

1. Fear → feeling afraid. Other words are *terror* (strong fear), *shock*, *phobia*
2. Anger → feeling angry. A stronger word is *rage*.
3. Sadness → feeling sad. Other words are *sorrow*, *grief* (a stronger feeling, for example when someone has died) or *depression* (feeling sad for a long time). Some people think depression is a different emotion.
4. Joy → feeling happy. Other words are *happiness*, *gladness.*
5. Disgust → feeling something is wrong or dirty
6. Trust → a positive emotion; admiration is stronger; acceptance is weaker
7. Anticipation → in the sense of looking forward positively to something which is going to happen. Expectation is more neutral.
8. Surprise → how one feels when something unexpected happens
   https://simple.wikipedia.org/wiki/List_of_emotions

Field of CS

- **Affective computing** is the study and development of systems and devices that can recognize, interpret, process, and simulate human affects. It is an interdisciplinary field spanning computer science, psychology, and cognitive science. While the origins of the field may be traced as far back as to early philosophical inquiries into emotion, the more modern branch of computer science originated with Rosalind Picard's 1995 paper[on affective computing.[A motivation for the research is the ability to simulate empathy. The machine should interpret the emotional state of humans and adapt its behavior to them, giving an appropriate response for those emotions.

Emotions and the user experience

- HCI has traditionally been about designing efficient and effective systems
- Now more about how to design interactive systems that make people respond in certain ways
  - e.g. to be happy, to be trusting, to learn, to be motivated
- Emotional interaction is concerned with how we feel and react when interacting with technologies

Emotional interaction

- What makes us happy, sad, annoyed, anxious, frustrated, motivated, delirious and so on
  - translating this into different aspects of the user experience
- Why people become emotionally attached to certain products (e.g. virtual pets)
- Can social robots help reduce loneliness and improve wellbeing?
- How to change human behavior through the use of emotive feedback

Emotional design model

https://www.youtube.com/watch?v=G7MeRkDkRN4

Norman, Ortony and Revelle (2004) model of emotion
Emotion and behavior is couched in terms of different levels of the brain

Conscious - people generalize across events, or step back from the routine and immediate

Subconscious – controls our everyday behavior i.e. talking, typing, driving

Subconscious – i.e. we don't like bitter things, we like sweet things

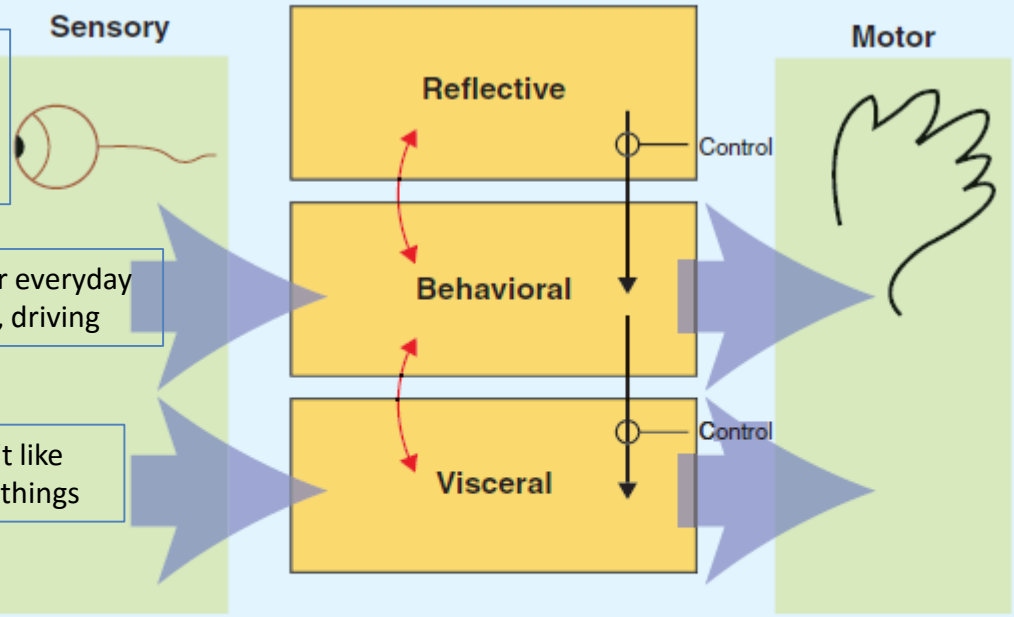

Figure 5.2 Ortony *et al*'s (2005) model of emotional design showing three levels: visceral, behavioral, and reflective

Source: The illustration and text are from Figure 1.1 of Norman, D. A. (2004). *Emotional Design: We love (or hate) everyday things*. New York: Basic Books. Reprinted with permission of the author.

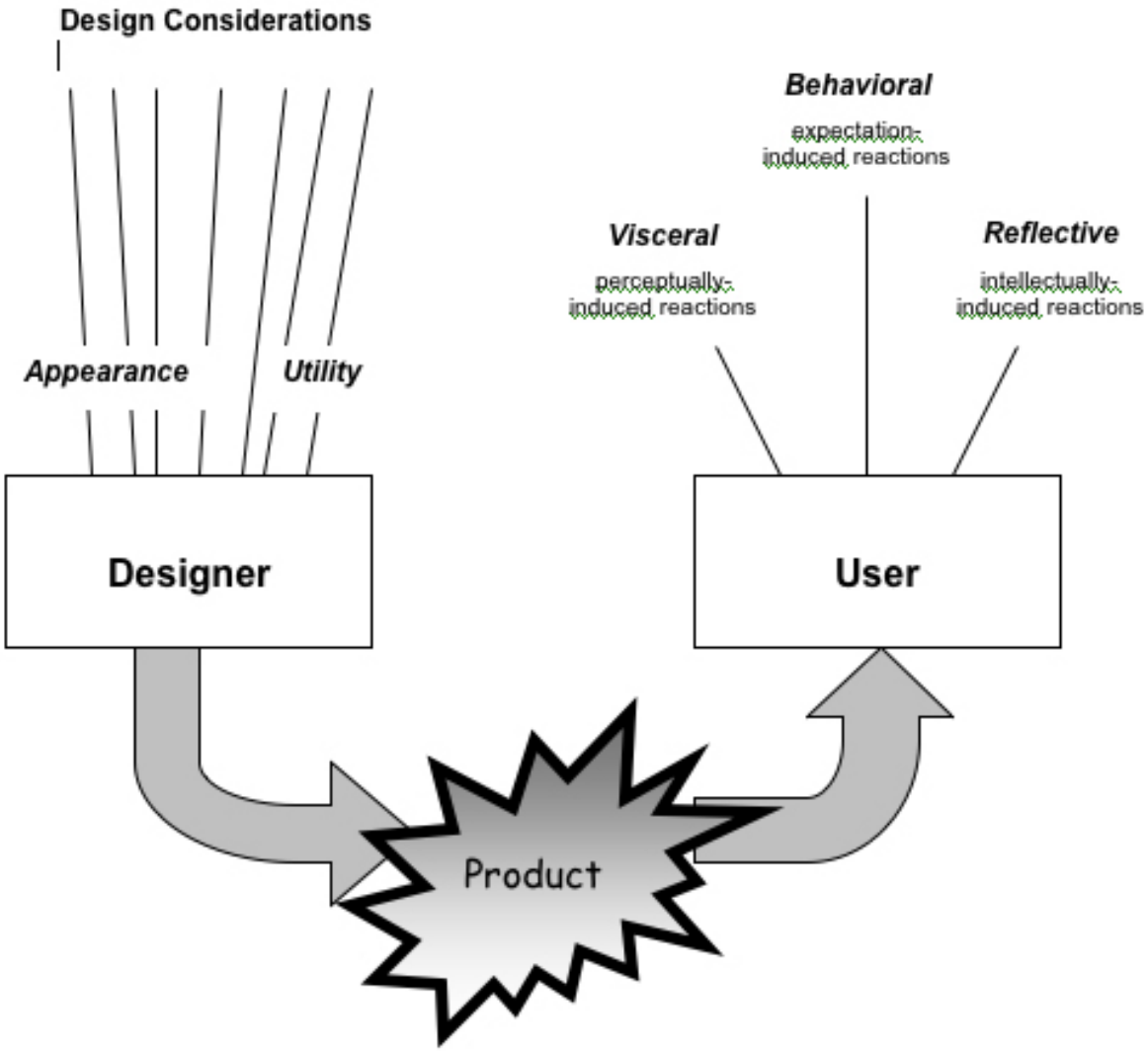

Figure 1. The Designer's View of the product differs from the User's view.
Many design considerations are considered by the designer. Here, we focus upon two: Appearance and Utility. In turn, the user has various reactions to the product. Here we focus on three fundamentally different kinds: Visceral (perceptually-induced), Behavioral (expectation-induced), and Reflective (intellectually induced). http://projectsfinal.interactionivrea.org/2004-2005/SYMPOSIUM%202005/communication%20material/DESIGNERS%20AND%20USERS_Norman.pdf

Claims from model

- Our emotional state changes how we think
  - when frightened or angry we focus narrowly and body responds by tensing muscles and sweating
    - more likely to be less tolerant
  - when happy we are less focused and the body relaxes
    - more likely to overlook minor problems and be more creative

Expressive interfaces

- Provide reassuring feedback that can be both informative and fun
- But can also be intrusive, causing people to get annoyed and even angry
- Color, icons, sounds, graphical elements and animations are used to make the 'look and feel' of an interface appealing
  - conveys an emotional state
- In turn this can affect the usability of an interface
  - people are prepared to put up with certain aspects of an interface (e.g. slow download rate) if the end result is appealing and aesthetic

Clippy

- Why was Clippy disliked by so many?
- Was it annoying, distracting, patronising or other?
- What sort of user liked Clippy?

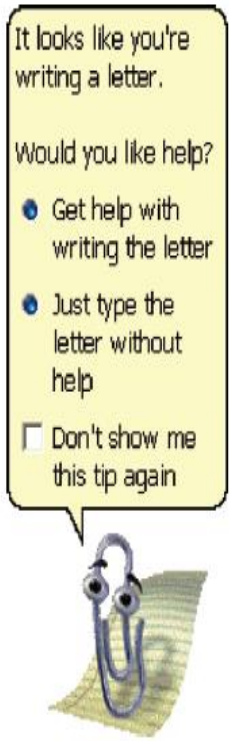

Figure 5.7 Microsoft's agent Clippy

Source: Microsoft product screenshot reproduced with permission from Microsoft Corporation.

Frustrating interfaces

- Many causes:
  - When an application doesn't work properly or crashes
  - When a system doesn't do what the user wants it to do
  - When a user's expectations are not met
  - When a system does not provide sufficient information to enable the user to know what to do
  - When error messages pop up that are vague, obtuse or condemning
  - When the appearance of an interface is garish, noisy, gimmicky or patronizing
  - When a system requires users to carry out too many steps to perform a task, only to discover a mistake was made earlier and they need to start all over again

Error messages

"The application Word Wonder has unexpectedly quit due to a type 2 error."

Why not instead:

"the application has *expectedly* quit due to poor coding in the operating system"

- Shneiderman's guidelines for error messages include:
  - avoid using terms like FATAL, INVALID, BAD
  - Audio warnings
  - Avoid UPPERCASE and long code numbers
  - Messages should be precise rather than vague
  - Provide context-sensitive help

More helpful error message

"The requested page **/helpme** is not available on the web server.

If you followed a link or bookmark to get to this page, please let us know, so that we can fix the problem. Please include the URL of the referring page as well as the URL of the missing page.

Otherwise check that you have typed the address of the web page correctly.

The Web site you seek
Cannot be located, but
Countless more exist."

Should computers say they're sorry?

- Reeves and Naas (1996) argue that computers should be made to apologize
- Should emulate human etiquette
- Would users be as forgiving of computers saying sorry as people are of each other when saying sorry?
- How sincere would they think the computer was being? For example, after a system crash:
  - "I'm really sorry I crashed. I'll try not to do it again"
- How else should computers communicate with users?

Detecting emotions and emotional technology

- Sensing technologies used to measure GSR, facial expressions, gestures, body movement
- Aim is to predict user's emotions and aspects of their behavior –
- E.g. what is someone most likely to buy online when feeling sad, bored or happy

Facial Coding

- Measures a user's emotions as they interact with a computer or tablet
- Analyses images captured by a webcam of their face
- Uses this to gauge how engaged the user is when looking at movies, online shopping sites and ads
- 6 core expressions - sadness, happiness, disgust, fear, surprise and anger

How to use the emotional data?

- If user screws up their face when an ad pops up -> feel disgust
- If start smiling -> they are feeling happy
- Website can adapt its ad, movie storyline or content to match user's emotional state
- Eye-tracking, finger pulse, speech and words/phrases also analysed when tweeting or posting to Facebook

Persuasive technologies and behavioral change

- Interacive computing systems deliberately designed to change people's attitudes and behaviors (Fogg, 2003)
- A diversity of techniques now used to change what they do or think
  - Pop-up ads, warning messages, reminders, prompts, personalized messages, recommendations, Amazon 1-click
  - Commonly referred to as nudging

How effective?

- Is the use of novel forms of interactive technologies (e.g., the combination of sensors and dynamically updated information) that monitor, nag, or send personalized messages intermittently to a person more effective at changing a person's behavior than non-interactive methods, such as the placement of warning signs, labels, or ads in prominent positions?

Tracking devices

- Mobile apps designed to help people monitor and change their behaviour (e.g. fitness, sleeping, weight)
- Can compare with online leader boards and charts, to show how they have done in relation to their peers and friends
- Also apps that encourage reflection that in turn increase well-being and happiness

Anthropomorphism

- Attributing human-like qualities to inanimate objects (e.g. cars, computers)
- Well known phenomenon in advertising
  - Dancing butter, drinks, breakfast cereals
- Much exploited in human-computer interaction
  - Make user experience more enjoyable, more motivating, make people feel at ease, reduce anxiety

Which do you prefer?

1. As a welcome message

- “Hello Chris! Nice to see you again. Welcome back. Now what were we doing last time? Oh yes, exercise 5. Let’s start again.”

- “User 24, commence exercise 5.”

Which do you prefer?

2. Feedback when get something wrong

1. *"Now Chris, that's not right. You can do better than that. Try again."*
2. *"Incorrect. Try again."*

Is there a difference as to what you prefer depending on type of message? Why?

Evidence to support anthropomorphism

- Reeves and Naas (1996) found that computers that flatter and praise users in education software programs -> positive impact on them

"Your question makes an important and useful distinction. Great job!"

- Students were more willing to continue with exercises with this kind of feedback

Criticism of anthropomorphism

- Deceptive, make people feel anxious, inferior or stupid
- People tend not to like screen characters that wave their fingers at the user and say:
  - Now Chris, that's not right. You can do better than that.Try again."
- Many prefer the more impersonal:
  - "Incorrect. Try again."
- Studies have shown that personalized feedback is considered to be less honest and makes users feel less responsible for their actions (e.g. Quintanar, 1982)

Virtual characters

- Appearing on our screens in the form of:
  - Sales agents, characters in videogames, learning companions, wizards, pets, newsreaders
- Provides a persona that is welcoming, has personality and makes user feel involved with them

Disadvantages

- Can lead people into false sense of belief, enticing them to confide personal secrets with chatterbots
- Annoying and frustrating
  - e.g. Clippy
- May not be trustworthy
  - virtual shop assistants?

Virtual agents

- What do the virtual agents do?
- Do they elicit an emotional response in you?
- Do you trust them?
- What is the style of interaction?
- What facial expression do they have?
- Are they believable, pushy, helpful?
- Would it be different if they were male? If so, how?

What makes a virtual agent believable?

- Believability refers to the extent to which users come to believe an agent's intentions and personality
- Appearance is very important
  - Are simple cartoon-like characters or more realistic characters, resembling the human form more believable?
- Behaviour is very important
  - How an agent moves, gestures and refers to objects on the screen
  - Exaggeration of facial expressions and gestures to show underlying emotions (c.f. animation industry)

Implications

- Should we create products that adapt according to people's different emotional states?
  - When people are feeling angry should an interface be more attentive and informative than when they are happy?
- Is Norman right?
  - designers "can get away with more" for products intended to be used during leisure time than those designed for serious tasks

Summary

- Emotional aspects of interaction design concerned with how to facilitate certain states (e.g. pleasure) or avoid reactions (e.g. frustration)
- Well-designed interfaces can elicit good feelings in people
- Aesthetically pleasing interfaces can be a pleasure to use
- Expressive interfaces can provide reassuring feedback to users
- Badly designed interfaces make people frustrated, annoyed, or angry
- Emotional technologies can be designed to persuade people to change their behaviors or attitudes
- Anthropomorphism is the attribution of human qualities to objects
- Virtual agents and robot pets have been developed to make people feel motivated, reassured, and in a good mood