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Paper:HCI

Q1:

a) The writer expresses lucidly how a new user will approach a product, how they make decisions based on design with how to proceed, and how they respond to feedback when decisions go wrong. Norman highlights experiences you'll have likely found in your own life. Keys and faucets with no directions on how to turn them or baffling doors that never seem to open the way you think they will. The human reaction is to blame yourself, but he cites these as examples of bad design – in the pursuit of pleasing aesthetics, designers forget to add basic signifiers on how to use their products.

b)

Deductive reasoning: conclusion guaranteed

Deductive reasoning starts with the assertion of a general rule and proceeds from there to a guaranteed specific conclusion. Deductive reasoning moves from the general rule to the specific application: In deductive reasoning, if the original assertions are true, then the conclusion must also be true. For example, math is deductive:

If x = 4
and if y = 1
Then 2x + y = 9

In this example, it is a *logical necessity* that 2x + y equals 9; 2x + y *must* equal 9. As a matter of fact, formal, symbolic logic uses a language that looks rather like the math equality above, complete with its own operators and syntax. But a deductive *syllogism* (think of it as a plain-English version of a math equality) can be expressed in ordinary language:

If entropy (disorder) in a system will increase unless energy is expended,
And if my living room is a system,
Then disorder will increase in my living room unless I clean it.

In the syllogism above, the first two statements, the *propositions* or *premises*, lead logically to the third statement, the *conclusion*.

Abductive reasoning: taking your best shot

Abductive reasoning typically begins with an incomplete set of observations and proceeds to the likeliest possible explanation for the set. Abductive reasoning yields the kind of daily decision-making that does its best with the information at hand, which often is incomplete.

A medical diagnosis is an application of abductive reasoning: given this set of symptoms, what is the diagnosis that would best explain most of them? Likewise, when jurors hear evidence in a criminal case, they must consider whether the prosecution or the defense has the best explanation to cover all the points of evidence. While there may be no certainty about their verdict, since there may exist additional evidence that was not admitted in the case, they make their best guess based on what they know.

Q2:

1. My car tire got punctured, and I want to repair it
2. Call the repairer
3. Call the repairer, change it yourself
4. Better change it yourself
5. I changed it myself
6. The car tire is repaired
7. Very good to change the tire

Q3:

a)

As nouns the difference between mistake and slip is that mistake is an error; a blunder while slip is (obsolete) mud, slime or slip can be a twig or shoot; a cutting or slip can be an act or instance of slipping.

As verbs the difference between mistake and slip is that mistake is to understand wrongly, taking one thing for another, or someone for someone else while slip is to lose one's traction on a slippery surface; to slide due to a lack of friction.

b)

Self-perception:

If you are like many people, you probably believe that you know what you feel and what the lie is. But, believe it or not, some studies have shown that people don't always know exactly how they feel. Instead, they use their own behavior to guess about what they are feeling. **Self-perception theory** says that, 'When people are unsure about their feelings and motivations, they will use their own behavior to infer what they feel.'

What does that have to do with the scenario above? When we lie to someone else, we sometimes begin to believe our own lies. We look at our own behavior - in this case the lie - and make an inference. So, in the example above, lying about your feelings could cause you to believe your own lie! You are using your behavior to figure out how you feel about something. You might be surprised at how often this happens.

Object-perception:

Although our eyes receive incomplete and ambiguous information, our perceptual system is usually able to successfully construct a stable representation of the world. In the case of ambiguous figures, however, perception is unstable, spontaneously alternating between equally possible outcomes. The present study compared EEG responses to ambiguous figures and their unambiguous variants. We found that slight figural changes, which turn ambiguous figures into unambiguous ones, lead to a dramatic difference in an ERP ("event-related potential") component at around 400 Ms. this result was obtained across two different categories of figures, namely the geometric Necker cube stimulus and the semantic Old/Young Woman face stimulus. Our results fit well into the Bayesian inference concept, which models the evaluation of a perceptual interpretation's reliability for subsequent action planning. This process seems to be unconscious and the late EEG signature may be a correlate of the outcome.

Q4:

a)

The three stages of perception process are:

1. Selective attention: this has to do with any moment we focus our awareness on only limited of all that we experience.
2. Organization and arrangements: this is concern with how the mind organizes a cluster of sensation into gestalt (whole).

3. Perceptual distortion and errors: this is the accuracy of interpersonal perception and the judgements made about other people.

b)

In terms of predictive coding, perception of our environment is transformed into 'bottom-up' signals, whereas recognition is the 'top-down' signal, representing the predictions we experienced earlier and added to our model of the world to make sense of and classify the perceived data.

The predictions are associated with GABA signals and gamma waves from the PFC towards 'lower' structures. If these predictions do not match the perceived data there will be a prediction error (encoded by dopamine) sent back (upwards) to update the predictions for future retrievals.

These predictions can imply cognitive biases: If the predictions are stronger - or the errors are less strong - one might 'experience' things that are not part of the 'reality' as others perceive it, because the prediction 'overwrites' the perception signals.

Q5:

a)

Goal: 3d shape

Problem domain: shaping

Task: using illustrator to make 3d shape

b)

The Gulf of Execution:

The gulf of execution is the degree to which the interaction possibilities of an artifact, a computer system or likewise correspond to the intentions of the person and what that person *perceives* is possible to do with the artifact/application/etc. In other words, the gulf of execution is the difference between the intentions of the users and what the system allows them to do or how well the system supports those actions (Norman 1988). For example, if a person only wants to record a movie currently being shown with her VCR, she imagines that it requires hitting a 'record' button. But if the necessary action sequence involves specifying the time of recording and selection of a channel there is a gulf of execution: A gap between the psychological language (or mental model) of the user's goals and the very physical action-object language of the controls of the VCR via which it is operated. In the language of the user, the goal of recording the current movie can be achieved by the action sequence "Hit the record button," but in the language of the VCR the correct action sequence is:

1) Hit the record button.
2) Specify time of recording via the controls X, Y, and Z.

3) Select channel via the channel-up-down control.
4) Press the OK button.

Thus, to measure or determine the gulf of execution, we may ask how well the action possibilities of the system/artifact match the intended actions of the user.

In the rhetoric of the GOMS model (see this), bridging the gulf of execution means that the user must form intentions, specify action sequences, execute actions, and select the right interface mechanisms (GOMS stands for **G**oals, **O**perators, **M**ethods and **S**election Rules).

The Gulf of Evaluation:

The gulf of evaluation is the degree to which the system/artifact provide representations that can be directly perceived and interpreted in terms of the expectations and intentions of the user (Norman 1988). Or put differently, the gulf of evaluation is the difficulty of assessing the state of the system and how well the artifact supports the discovery and interpretation of that state (Norman 1991). "The gulf is small when the system provides information about its state in a form that is easy to get, is easy to interpret, and matches the way the person thinks of the system" (Norman 1988: p. 51).

Thus, if the system does not "present itself" in a way that lets the user derive which sequence of actions will lead to the intended goal or system state, or derive whether previous actions have moved the user closer to her goal, there is a large gulf of evaluation. In this case, the person must exert a considerable amount of effort and expend significant attentional ressources to interpret the state of the system and derive how well her expectations have been met. In the VCR example from above, the design of the controls of the VCR should thus 'suggest' how to be used and be easily interpretable (e.g. when recording, the 'record' control should signal that is is activated or a display should).