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Department of Psychology

Examination paper for PSY1012/PSYPRO4112
Cognitive Psychology I

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ENGELSK

ENGLISH

Answer 2 of the following 3 questions:

1. Describe different properties of language and the processes that make the foundation for language comprehension.
2. What is the difference between a top-down and a bottom-up approach to perception?
3. How accurate can you expect your memory of events to be?
What processes influence accuracy?

BOKMÅL

To av tre oppgaver skal besvares:

1. Beskriv ulike egenskaper ved språk og de prosessene som ligger til grunn for språkforståelse.
2. Hva er forskjellen mellom en top-down og en bottom-up tilnærming til persepsjon?
3. Hvor nøyaktig kan du forvente at hukommelse for en hendelse skal være?
Hvilke prosesser påvirker nøyaktigheten?

NYNORSK

Svar på to av tre oppgåver:

1. Gi ei skildring av ulike eigenskapar ved språk og dei prosessane som ligg til grunn for språkforståing.
2. Kva er forskjellen mellom ei top-down og ei bottom-up tilnærming til persepsjon?
3. Kor nøyaktig kan du forvente at hukommelse for ei hending skal vere?
Kva prosessar påverkar nøyaktigheita?

Eksamensoppgave i PSY 1012 Kognitiv psykologi høst 2014

To av tre oppgaver skal besvares:

1. **Describe different properties of language and the processes that make the foundation for language comprehension. Beskriv ulike egenskaper ved språk og de prosessene som ligger til grunn for språkforståelse.**

The answer could contain a general description that language is communicative, arbitrary symbolic, regularly structured, structured at multiple levels, generative, productive and dynamic. The answer is expected to contain two fundamental aspects, that humans derive meaning from language for understanding and that we also that we transform meaning to express in linguistic output. Some or all of the building blocks may be addressed with linguistic terminology, from the smallest units through phonology, further through morphology, syntax and semantics and also discourse. The process of language comprehension would need to address speech perception, and could contain a description of the syntactic and semantic processes.

2. **Exam question Perception: Q: What is the difference between a top-down and a bottom-up approach to perception? Hva er forskjellen mellom en top-down og en bottom-up tilnærming til persepsjon?**

A: In order to receive information from the environment we are equipped with sense organs e.g. eye, ear, nose. Each sense organ is part of a sensory system which receives sensory inputs and transmits sensory information to the brain. A particular problem for psychologists is to explain the process by which the physical energy received by sense organs forms the basis of perceptual experience. Sensory inputs are somehow converted into perceptions of desks and computers, flowers and buildings, cars and planes; into sights, sounds, smells, taste and touch experiences. A major theoretical issue on which psychologists are divided is the extent to which perception relies directly on the information present in the stimulus. Some argue that perceptual processes are not direct, but depend on the perceiver's expectations and previous knowledge as well as the information available in the stimulus itself. Psychologists distinguish between two types of processes in perception: *bottom-up processing* and *top-down processing*.

Bottom-up processing is also known as data-driven processing, because perception begins with the stimulus itself. Processing is carried out in one direction from the retina to the visual cortex, with each successive stage in the visual pathway carrying out ever more complex analysis of the input. David Marr can be described here.

Top-down processing refers to the use of contextual information in pattern recognition. For example, understanding difficult handwriting is easier when reading complete sentences than when reading single and isolated words. This is because the meaning of the surrounding words provide a context to aid understanding.

Psychologist **Richard Gregory** argued that perception is a constructive process which relies on **top-down processing**. For Gregory (1970) perception is a hypothesis, for him, perception involves making inferences about what we see and trying to make a best guess. Prior knowledge and past experience, he argued, are crucial in perception. When we look at something, we develop a perceptual hypothesis, which is based on prior

knowledge. The hypotheses we develop are nearly always correct. However, on rare occasions, perceptual hypotheses can be disconfirmed by the data we perceive.

3. How accurate can you expect your memory of events to be? What processes influence accuracy? Hvor nøyaktig kan du forvente at hukommelse for en hendelse skal være? Hvilke prosesser påvirker nøyaktigheten?

Hvor nøyaktig kan du forvente at hukommelse for en hendelse skal være? Hvilke prosesser påvirker nøyaktigheten? How accurate can you expect your memory of events to be? What processes influence accuracy?

One way to approach this question is to elaborate on Schacter's seven sins of memory, listed on page 238 of the fifth edition (chapter on memory processes). These are:

1. Transience. Memory fades. Depending on how much time is available to answer the questions, students may elaborate on this to list phenomena involved forgetting, such as proactive interference, retroactive interference or decay.
2. Absent-mindedness. This is lack of attention. What I consider most relevant here are divided attention as an example of limited attentional capacity, selective attention, as an example of excluding information considered irrelevant at the time, and concrete examples such as change blindness. Topics such as filter bottleneck and attentional resource models I consider less relevant, unless they are used to explain selective or divided attention.
3. Blocking. Sternberg only offers examples such as the tip of the tongue phenomenon, without discussing underlying mechanisms. We therefore cannot expect any discussion of those mechanisms.
4. Misattribution. Information from one event is misattributed to another, or an inference is misattributed to a story or an experience. For example, people told that "Little Johnny's mother looked out of the kitchen window to see why he was making so much noise. She saw that he was banging a nail into the bird house he was building." People are later asked what tool the story said little Johnny had been using. Many report a hammer, even though the story did not mention the tool; a hammer is merely a plausible inference, that may have been inserted into a mental image that people constructed. Sternberg also provides examples from Loftus' research, where often information contained in a question is falsely attributed to the original event the question asks about.
5. Suggestibility. This is misattribution where the false information specifically comes from someone else's suggestion. Therefore Loftus' research also fits this category.
6. Bias. This is a quantitative distortion of memory. Because Sternberg does not discuss this further at this point, and other relevant information is not in the chapters that are penumbral, we can't expect anything more here.
7. Persistence. Some memories are far more accessible than people would like, such as in post-traumatic stress disorder. However, the phrasing of the exam question makes persistence irrelevant, so we can't expect anything on this, either.

A focus on Schacter's sins of memory requires the student to integrate information from different chapters of the book.

An alternative approach would be to focus on Loftus' research on eyewitness and autobiographical memory, and perhaps on the Roediger-McDermott memory illusion paradigm. A word list consisting of the 15 strongest associates of a core word is presented to subjects, but the core word is omitted. Yet this core word is often recognised or recalled in later tests. Sternberg attributes this to spreading activation.