

Eksamensoppgaver PSY1012/PSYPRO4112 – kognitiv psykologi 1

Besvar to av de tre følgende oppgavene:

1. Hva er forskjellen mellom en top-down og en bottom-up-tilnærming til persepsjon?
2. Hvordan oppfatter mennesker ord i språket?
3. Beskriv de ulike systemene i langtidshukommelsen og hvordan de virker. For hver av dem, forklar hva konsekvensene ville bli hvis noen manglet dette hukommelsessystemet. Merk at kun noen av disse teoretisk mulige spesifikke hukommelsesavvikene er observert i virkeligheten. For dem som ikke synes å forekomme, bør du slutte deg til hvordan de ville arte seg. Dette handler dermed like mye om hva du tror som hva du vet.

Sensorveiledning til spørsmål 1:

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 provides 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

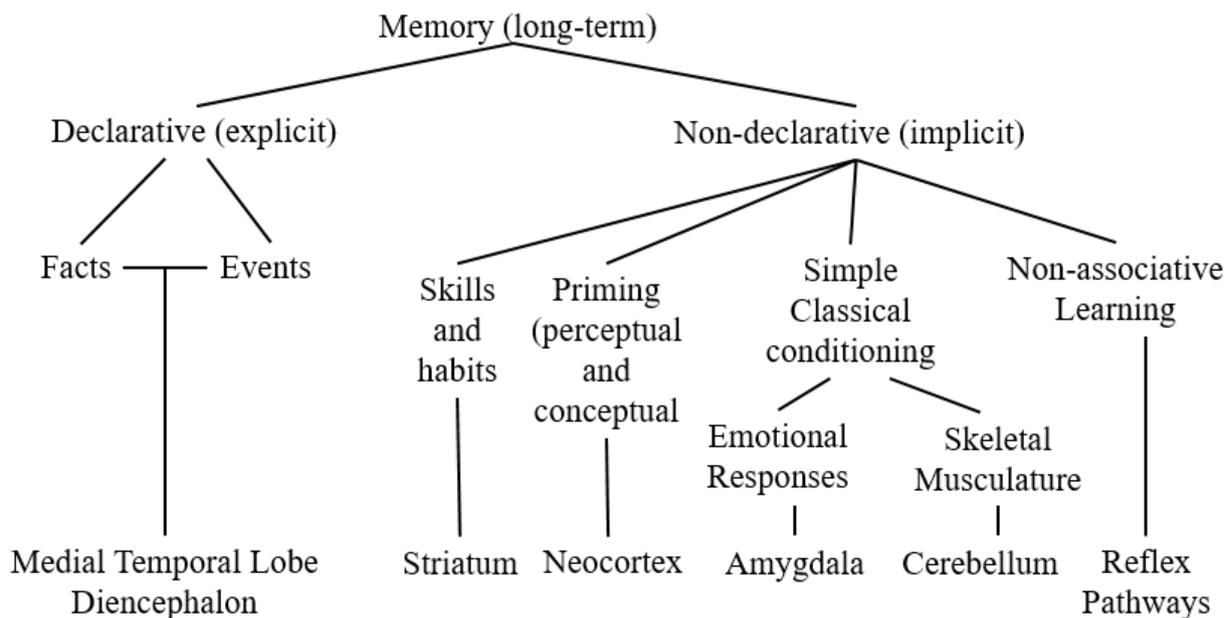
knowledge. The hypotheses we develop are nearly always correct. However, on rare occasions, perceptual hypotheses can be disconfirmed by the data we perceive.

Sensorveiledning til spørsmål 2:

Language can be described in different ways, but some of the commonalities between different languages that they are communicative, rule-based and creative. The different levels in studying language may be mentioned, like phonetic, morphemic level etc. The units we are most aware of in language are words, the units that contain and transfers meaning from one person to another. Understanding words is vital to good language processing, as is being able to put words together to form sentences. The process of perceiving words requires the perception of smaller units but meaning will always affect the perception of sounds/phonemes in oral language as well as letters in written language. The phonemic restoration effect shows this by demonstrating how our perception covers lacking sounds based on meaning of a word. Contextual meaning also plays a role in perceiving written letters in written language. The word superiority effect demonstrates that a letter is more easily recognised when part of a word compared to when it is part of a non-word or when appearing alone. Lexical effects are highly relevant for answering the question, as are knowledge about how syntax and semantics guide word processing.

Sensorveiledning til spørsmål 3:

Inspired by early research on amnesia, the first division traditionally is into explicit or declarative memory and implicit or non-declarative memory. Declarative memory is then further subdivided into episodic memory, which is memory for specific events, and semantic memory, which is memory for facts. The Goldstein & van Hooff book divides non-declarative memory only into procedural memory, conditioning and priming, omitting non-associative learning and not further subdividing conditioning.



Amnesia is a severe loss of episodic memory. Retrograde amnesia is the loss of memory from before the event that caused amnesia. Anterograde amnesia is an impairment in the acquisition of new information. Retrograde without anterograde amnesia can be caused by concussion. Anterograde amnesia may be caused by damage to the hippocampus and other medial temporal lobe structures. The loss of episodic memory, or mental time travel into the past, leads to severe practical difficulties, such as inability to remember what daily activities have been completed (buying food, switching off the stove, brushing teeth). Although the penum does not mention this, the better students may realise that an impairment of episodic memory implies an impairment of prospective memory: if I want to remember an appointment, I must imagine the future appointment and what I must do when in a possible future. That involves mental time travel into the future, which is impaired as much as mental time travel into the past. On the other hand, losing episodic memory should also come with reduced regret, because regret involves imagining alternative pasts, which is mental time travel into the past.

The books differ a bit in how they discuss impairments of semantic memory. Sternberg mentions agnosias in the chapter on perception. Agnosias come in many different forms. Thus impairments in the semantic part of declarative memory can be specific to sensory modality and to specific classes of items, while there is no report of such specificity regarding impairments of episodic memory. Goldstein and van Hooff do not mention agnosias, but in chapter 9 briefly refer to patients with category-specific semantic deficits. Thus both sources mention the specificity of semantic memory. Students can then work out that semantic memory impairments would involve inability to recognize things, possibly restricted to specific subsets, while still being able to describe those same things and remember events involving those things. Reasoning would be impaired by ignorance of what things are.

The penum does not discuss selective impairments in any of the non-declarative memory systems. Here, the students can only work out reasonable predictions.

Priming makes information related to recent experience more easily retrievable. Priming can be thought of as updating estimates of the base rates of events. An absence of priming should lead to reduced top-down processing of that kind. Further, to the extent that availability for retrieval also results in a feeling of familiarity, an absence of priming should reduce those.

Whereas priming is learning about single events, classical conditioning involves learning the probabilistic relationships between events, often resulting in a gut feeling or emotional response without explicit knowledge of the source of the feeling. A selective impairment of classical conditioning should be associated with the loss of such emotional responses to events. Classical conditioning can be thought of as updating estimates of the *conditional* probabilities of events: given that event A has been observed, how likely is event B now?

Procedural or skills learning, or instrumental conditioning, is important to learning new responses without having to devote a lot of attention to them. In the absence of pro