Exam PSY1300/PSYC1230, v22

<u>**Norsk versjon**</u>

Bare tre (3) av de følgende fire (4) oppgaver skal besvares. Hold svarene korte! Svarene kan avgis på norsk, engelsk, svensk eller dansk.

Oppgave 1 – Læring: (a) Hvordan foregår klassisk betinging, og hva vil en korrekt gjennomført prosedyre resultere i? (b) Beskriv viktige elementer i operant betinging. (c) Forklar hva forsterkningsskjemaer er, og gi eksempler på hvordan forskjellige slike skjemaer påvirker adferd.

Oppgave 2 – Arbeidsminne: (a) Hva er forskjellen mellom arbeidsminne og korttidsminne? (b) Beskriv kort de 4 hovedkomponentene i Baddeleys arbeidsminnemodell og hvordan de interagerer. (c) Hva bestemmer mengden informasjon som kan holdes aktivert i fonologisk arbeidsminne ifølge Baddeley? Hvordan forholder det seg til George A. Miller's magiske nummer 7?

Oppgave 3 – Langtids hukommelse: Innkoding og gjenfinning: (a) Hvordan fungerer gjenfinning («retrieval») av episodisk hukommelse? (b) Hva er innkodingen spesifisitets prinsipp? Beskriv en studie som kan teste prinsippet. (c) Beskriv én (evidensbasert) metode for å forbedre minneytelsen, f.eks. når du vil huske en handleliste.

Oppgave 4 - Representasjon av kunnskap: (a) Hva er forskjellen mellom grunnet («grounded») og amodal konseptrepresentasjon («representation of concepts»)? Hva er kognisjon forutsatt at den er basert på grunnet representasjon? (b) Den funksjonelle ekvivalenshypotesen hevder at visuell forestillingsevne («visual imagery») og visuell persepsjon bygger på lignende prosesser. Beskriv en forskningsstudie som indikerer at visuell forestilling og visuell persepsjon faktisk er «lignende». (c) Beskriv en studie som viser at de to ikke er identiske.

Only three (3) of the following four (4) questions have to be answered. Keep the answers brief! The answers can be given in English, Norwegian, Swedish, or Danish.

Question 1 – Learning: (a) How does classical conditioning take place, and what will a correctly performed procedure result in? (b) Describe important elements in operant conditioning. (c) Explain what reinforcement schemes are and give examples of how different such schemas affect behaviour.

Question 2 – Working memory: (a) What is the difference between working memory and short-term memory? (b) Briefly describe the 4 main components of Baddeley's working memory model and how they interact. (c) What determines the amount of information that can be held activated in phonological working memory according to Baddeley? How does it relate to George A. Miller's magical number 7?

Question 3 – Long-term memory: encoding and retrieval: (a) How does retrieval of episodic memory work? (b) What is the encoding-specificity principle? Describe a study that could test it. (c) Describe one (evidence-based) method to improve memory performance, e.g. when memorizing a shopping list.

Question 4. Representation of knowledge: (a) What is the differences between grounded and amodal representation of concepts? What is "cognition" assuming it is based on grounded representation? (b) The "functional equivalence hypothesis" claims that visual imagery and visual perception rely on comparable processes. Describe a study that indicates that visual imagery and visual perception are indeed "comparable". (c) Describe a study which shows that they are not identical.

Exam PSY1300/PSYC1230, v22, grading instructions

The grading instructions are formulated for graders with good background knowledge in cognitive psychology. Accordingly, the instructions only highlight the key aspects, which should be discussed in an ideal answer to the given question. The provided instruction should not be seen as examples of ideal answers to the questions.

1. General grading instruction

Only 3 of 4 questions listed above had to be answered. Each question gives max. 5 points so that the total exam yields a maximum of 15 points. The instructions below provides guidelines for awarding points by subquestion. Maximal points per sub-question are indicated in brackets (see *Key points to be addressed in answer).* However, should an answer in one subquestion be particularly well formulated it might be used to compensate a "point loss" in another subquestion within the *same* question. Likewise, penalization is possible (i.e., for unstructured writing, or extensively long answers which are not to the point).

Points-to-grade conversion: 5 points (33%) will be the "pass threshold" and grades should accordingly be assigned as:

<div align="center">

0-4.99 pts = F,

5-6.99 pts = E,

7-8.99 pts = D,

9-11.99 pts = C,

12-13.99 pts = B,

14-15.00 pts = A.

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Cautious note: The exam will allow students to use the textbook, so please be aware of potential plagiarism. These answers should be counted as 0 points. Please contact me (rene.westerhausen@psykologi.uio.no) if you have any questions or notice any irregularities during grading. For example, in the past it has occurred that one question was too difficult, i.e. no candidate got 5 points in this question. In this case, as all the questions should be of approximately the same difficulty, the grading was adjusted accordingly (i.e., the question was weighted when summing up the total score). I encourage to use an excel table to track the points per question across all candidates. If you do so, please feel free to share it with me after grading so that I can assess difficulty of the questions and systematic inter-grader differences etc to be able to improve the objectivity of the instruction.

References:

- Gilhooly, K., Lyddy, F., Pollick, F., & Buratti, S. (2020, 2nd edition). Cognitive Psychology. London: McGraw Hill.
- Groome & Eysenck (2016). An introduction to applied cognitive psychology (2nd edition). Psychology Press
- Stangor, & Walinga (2014). Introduction to psychology. BCcampus. (chapters 8.1/8.2)

2. Questions and key points

2.1 Question 1 - Learning: (a) How does classical conditioning take place, and what will a correctly performed procedure result in? (b) Describe important elements in operant

conditioning. (c) Explain what reinforcement schedules are, and give examples of how different such schemas affect behaviour.

(a) Den ubetingede stimulus utløser en naturlig forekommende (ubetinget) respons. I Pavlovs klassiske studie var den ubetingede stimulus mat, og den ubetingede respons var salivering. Den betingede stimulus er en opprinnelig nøytral stimulus som gjentatte ganger blir presentert rett før eller samtidig med den ubetingede stimulus. Hvis betingingsprosedyren blir gjennomført riktig, er resultatet at den betingede stimulus alene kan utløse en betinget respons. Den betingede respons er I hovedsak lik den ubetingede responsen. I tillegg til å beskrive det ovenstående, som er essensen i det oppgaven spør om, er det ikke irrelevant om studenten nevner ting som ekstinksjon, generalisering og annen ordens betinging. En god beskrivelse av prosedyren og resultatet over skal imidlertid være tilstrekkelig til å få full pott. (Stangor & Walinga, 8.1.) **[max 1.5 poeng]**

(b) Essensen i operant betinging er at organismens adferd blir formet av sine konsekvenser. Det er rimelig å nevne at konsekvenser kan være positiv eller negativ forsterkning, samt positiv eller negativ straff (tabell 8.1 i Stangor & Walinga har gode beskrivelser). Det bør belønnes hvis studenten har med ett eller flere fenomener som forsterkningsskjemaer (reinforcement schedules), shaping eller sekundære forsterkere (secondary reinforcers, også kalt betingede forsterkere eller conditioned reinforcers). (Stangor & Walinga 8.2). **[max 1,5 poeng]**

(c) Et forsterkningsskjema er en regel som styrer fordelingen av forsterkere. Det enkleste eksemplet vil være en regel som sier at alle responser i en bestemt kategori blir forsterket. Pensum omtaler flere andre forsterkningsskjemaer: Fixed ratio, fixed interval, variable ratio og variable interval. Disse beskrives nærmere i tabell 8.2 hos Stangor & Walinga. (Det fins også mange andre forsterkningsskjemaer enn dem som nevnes i pensum.) I dyreforsøk med fixed interval-skjemaer, ser man typisk en tendens til responsraten går ned umiddelbart etter forsterkningen. Deretter vil responsraten normalt øke igjen etterhvert som tidspunktet for neste forsterkning nærmer seg. (Pensum bemerker at mange leser til eksamen på samme måte.) I et variable interval-skjema vil tidspunktet for forsterkning variere rundt gjennomsnittsintervallet, noe som gjør det umulig å predikere nøyaktig når en forsterker vil forekomme. Et eksempel kan være å sjekke meldinger på mobilen. Hvis forsterkning i form av nye meldinger forekommer gjennomsnittlig hvert 30. minutt, vil det kunne variere hvor lang tid det går mellom hver melding. Intervall-forsterkningskjemaer gir oftest en lav og jevn responsfrekvens. Adferdseffekt av flere forsterkningsskjemaer omtales i Stangor & Walinga, del 8.2. (Stangor & Walinga, 8.2) **[max 2 poeng]**

2.2 Question 2 – Working Memory. (a) What is the difference between working memory and short-term memory? (b) Briefly describe the 4 main components of Baddeley's working memory model and how they interact. (c) What determines the amount of information that can be held activated in phonological working memory according to Baddeley? How does it relate to George A.. Miller's magical number 7?

(a) Multiple answers possible: they might be used as synonyms, or the term short-term memory emphasizes more the storage component, while working memory more the processing aspects. Important here is that the answer shows that the student has thought about the relation **[1 point]**

(b) Here the 4 main components (phonological loop, visual spatial sketchpad, episodic buffer and central executive) should be described. The main function of each subcomponent and potential subprocesses should be mentioned. The answer also should include that PL, VSS,

EB are considered the "slave systems" in support of the central executive. (Gilhooly et al., p. 197ff) **[2 points]**

(c) The answer should indicate that the amount is determined by the subvocal rehearsal ability/speed of the inner voice within the PL. Rehearsal, i.e. sub-vocal (inner) articulation, revives the memory trace; and the time it takes to rehearse determines memory span. Here the word-length (or comparable) effect might be mentioned. This contradicts the idea of that we have a fixed maximum number of items we can "keep up" in working memory, as e.g. expressed by G. A. Miller's magical number 7. (Gilhooly et al., p. 197ff) **[max 2 points]**

2.3 Question 3 – Long-term memory: encoding and retrieval: (a) How does retrieval of episodic memory work? (b) What is the encoding-specificity principle? Describe a study that could test it. (c) Describe one (evidence-based) method to improve memory performance, e.g. when memorizing a shopping list.

(a) A good answer describes the "cue dependency" (ideally term named) of memory retrieval and discusses the interaction of "retrieval cue" the encoded "memory trace" for a successful retrieval. Bonus if pointed out that the retrieval process is a "reconstruction" of the episode (see Groom, 138-142) **[max 1.5 points]**

(b) Encoding specificity principle: Retrieval is enhanced when the cues available (during retrieval) match the features present/stored during encoding. Example could be any describing context- or state-dependent retrieval effects, like e.g. the diving study (see Gilhooley, p. 266; or Groome p.140/141) **[max 1.5 points]**

(c) Any answer that draws upon empirical effect discussed in the literature. For example, level of processing theory, dual-coding theory, spacing effect, or generation effect. Alternatively, on of the classical mnemonic techniques might be described here, eg. Method of loci. The selected method should be explicitly named, well-described and applied (various places in literature: e.g. Groome, p. 125ff, Gilhooly, p. 263/264) **[max 2 points].**

2.4 Question 4 - Representation of knowledge: (a) What is the differences between grounded and amodal representation of concepts? What is "cognition" assuming it is based on grounded representation? (b) The "functional equivalence hypothesis" claims that visual imagery and visual perception rely on comparable processes. Describe a study that indicates that visual imagery and visual perception are indeed "comparable". (c) Describe a study which shows that they are not identical.

(a) Grounded representations are representations that involve sensory-motor codes; i.e. concepts are represented by sensory information; Amodal representations are representations that are abstract and do not involve any sensory codes; i.e. concepts are represented by symbols unrelated to sensory information. From a grounded rep perspective: Cognition is based on simulation of previous perceptual experience, i.e an re-enactment of perceptual, motor and introspective states acquired during experience of the world (Gilhooly, p.307/308) **[max 2 points].**

(b) any study showing a relation between perceptual distance and imagery-related responses, e.g. mental rotation or mental scanning tasks (various examples can be found in chapter 9 of Gilhooley, p. 312ff) **[max 1.5 points].**

(c) the rabbit-duck illusion study (Gilhooly, p.318) – shows that the image can be "flipped" in perception but not as "imagined" picture **[max 1.5 points].**