Eksamen PSY2301 – Høsten 2022 - Sensorveiledning

The candidates will have to answer 3 out of 4 tasks in 3 hours. The tasks are based on a list of questions which were given to the students after the lectures and are thus known to them before the exam. Students were told early in the semester that the tasks in the exam are very similar, but not identical, to these practice tasks. This means that we place higher demands on the students' answers than if they had not known the tasks in advance.

The questions have to be answered based on the relevant lecture slides (attached), podcasts/videos/læringsprogram/articles that were prepared by the lecturers, and the course book Wastell, C., & Howarth, S. (2021). Reasoning, judging, deciding: The science of thinking. Sage.
For an exemplar of the book, or if you have any questions, please contact
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Three out of four tasks must be answered, otherwise the student fails the exam. The tasks should be weighted evenly. If a task has been answered but the answer is insufficient (fail), an overall assessment must be made across the three tasks. Whether or not the exam is failed will then depend on how good the other two answers are. Students were told to only answer three tasks. They will not get extra points for answering four tasks. If four tasks are answered, only the first three tasks should be evaluated.

The tasks can be answered based on the curriculum (including the book, specified papers, podcasts/videos/læringsprogram by the lecturers) and lectures. The tasks are graded according to the extent to which relevant factors (see below) are included in the student's response, but also based on *the presentation of the response,* i.e., whether the response reflects understanding of the material and shows a clear line of thought.

When grading, please take into account the general requirements of the Department of Psychology for the various grades, as formulated here:
https://www.uio.no/studier/eksamen/karakterer/fagspesifikk-karakterbeskrivelse/sv-psi-201104.pdf

About the use of sources: The exam in PSY2301 is a school exam. It is quite common for students on the school exam to mention the names of researchers and refer to lecture scripts and curriculum. Students have been notified that in psychology, the so-called APA formatting rules are used when referring to a source, see e.g., this link:
https://i.ntnu.no/oppgaveskriving/apa-7
(links to external page.) However, there is no requirement for students to use APA format in the exam and responses are not downgraded for not including references to the researchers behind e.g., a described study/theory. It is much more important that students describe the studies/theories correctly and that the studies/theories are relevant to the respective task.

1. **I hvilken grad ignorerer vi grunnfrekvenser ved sannsynlighetsvurderinger, og hvordan kan vi hjelpe oss selv til å forstå betingede sannsynligheter?**

1. **To what extent do we ignore base-rates in probability assessments, and how can we help ourselves understand conditional probabilities?**

Betingede sannsynligheter er sannsynligheten for at en hendelse skal inntreffe gitt at en annen hendelse har skjedd, og er veldig vanlige i beslutningssituasjoner. Ofte når folk skal vurdere slike sannsynligheter gjør de en feil som kalles base-rate fallacy der man overvurderer den spesifikke informasjonen og undervurderer grunnfrekvensene. De vil kunne gi eksempler som advokat/ingeniør studien til Kahneman og Tversky, mammografi eksemplet, barn med briller/tv-titting, osv. Base rate fallacy har blitt diskutert i flere forelesninger. Her er oppgaven til K&T og definisjonene som de ble vist på forelesning:

Base-rate fallacy

You are presented with résumés: 30 from Engineers and 70 from Lawyers. You randomly draw out one résumé from these. **From the following description to which of the two groups does the person belong?**

Jack is a 45-year-old man. He is married and has four children. He is generally conservative, careful and ambitious. He shows no interest in political and social issues and spends most of his free time on his many hobbies which include home carpentry, sailing and maths puzzles.
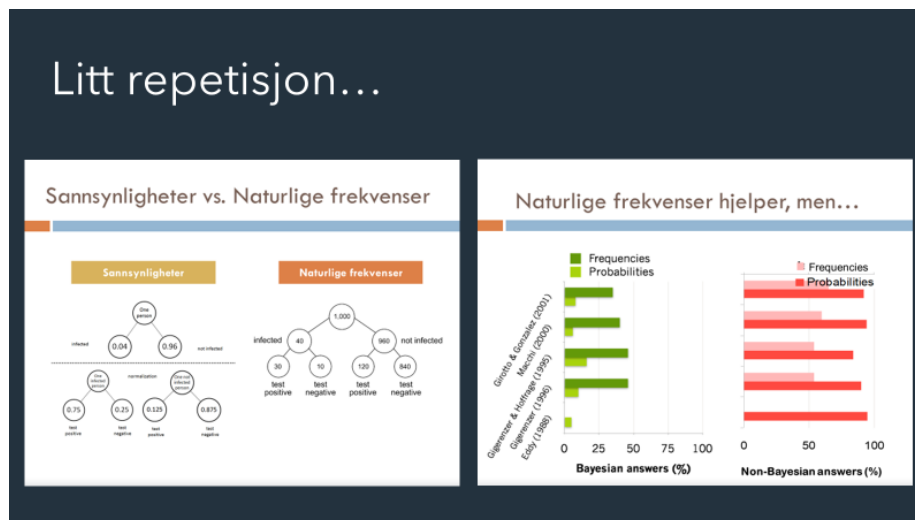
Base-rate fallacy

- Mangelfull integrering ny informasjon (tilfellespesifikk informasjon eller individuell informasjon) med eksisterende informasjon om grunnfrekvenser (base-rate).
- To typer:
  1. **Base-rate neglect:** Ignorerer grunnfrekvenser og overvekter tilfellespesifikk informasjon.
  2. **Base-rate domination:** Ignorerer tilfellespesifikk informasjon og overvekter grunnfrekvenser.

- Betingede sannsynligheter - kan løses med Bayes teorem.
- Veldig vanlige i alle slags beslutningssituasjoner.
- Selv eksperter tar feil…

$$P(A|B) = \frac{P(B|A) * P(A)}{P(B)}$$

Vi vil gjerne at de skal nevne at base-rate fallacy kan oppstå ved bruk av representativitetsheuristikken, de kan løses ved hjelp av Bayes teorem, men kan løses lettere ved bruk av «natural frequencies» (Gigerenzer).

Ekstra pluss for de som tar med studien som bruker spillekort som øker andelen riktige svar på slike oppgaver (se bilder under) og nevner the extended mind eller nevner at det er to typer base-rate fallacy. Vi forventer ikke at noen demonstrerer hvordan man løser betingede sannsynligheter med naturlige frekvenser, eller at de husker helt nøyaktige tall.

Figure 1. Sample of cards used in the high-interactivity condition in Experiments 1 and 2. See the online article for the color version of this figure.
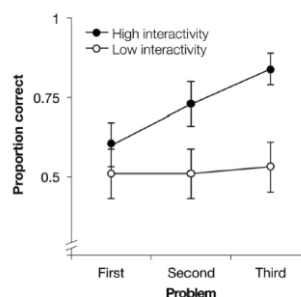
Figure 2. Proportion of Bayesian answers with natural frequency statements as a function of interactivity level (low, paper-and-pencil only vs. high, paper-and-pencil with cards), and problem trial (first, second, or third).

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2. Usikkerhet og sannsynligheter i ord og tall. Betyr ordene og tallene det samme?

2. Uncertainty and probabilities in words and numbers. Do the words and numbers mean the same thing?

Her er det en del studentene kan svare, dette har blitt dekket i to forelesninger og en artikkel på pensum (Teigen, 2023). Vi forventer at de forklarer forskjellen (slide 1) og lister opp noen egenskaper ved hver av dem (slide 2), men de blir ikke trukket hvis de ikke har med alt på slide 2.

Numeriske og verbale sannsynligheter

- Usikre hendelser kan beskrives numerisk eller verbalt
  - Numerisk: tall mellom $0-1$ eller i prosent $(0-100\%)$
  - Verbalt: En sjanse, sannsynlig, usannsynlig, nesten sikkert, etc.
- Vi foretrekker å **produsere** verbale sannsynligheter og **få oppgitt** numeriske sannsynligheter

Numeriske og verbale sannsynligheter

Verbale sannsynligheter

- Lettere å produsere
- Enklere å forstå
- Vage – mindre forpliktende
- Mindre tvetydige – positive og negative begreper (form for framing)
- Men, folks tolkninger av disse begrepene er veldig variable

Numeriske sannsynligheter

- Mer presise
- Lettere å bruke i utregninger
- Vanskeligere å generere
- Ikke alltid så lette å forstå
  - Mr. Jones – 20% vs. 20 ut av 100
  - Betingede sannsynligheter

Studentene har blitt vist tabellen med Barry under som viser hva som skjer når deltagere blir bedt om å oversette varbale sannsynligheter for bi-virkninger (til venstre). Kolonnen i midten er standarden, altså det de verbale sannsynlighetene skal bety, mens kolonnen helt til høyre er deltagernes oversettelser. De trenger ikke huske helt nøyaktige tall, men at de får frem at det er veldig stor forskjell mellom hva de verbale sannsynlighetene er ment å bety og hvordan de tolkes.

| Verbal description (EC)	Assigned frequency (EC)	Subj. estimates (Berry et al., 2003)
Very common	Above 10%	65%
Common	1-10%	45%
Uncommon	0.1-1%	18%
Rare	0.01-0.1%	8%
Very rare	< 0.01%	4%

Karl Halvor viste også disse eksemplene på hva verbale sannsynligheter betyr ifølge EFSA, IPCC, og NATO:

Verbale sannsynlighetsskalaer anbefalt av EFSA (European Food Safety Authority),

IPCC (Intergovernmental Panel on Climate Change), og NATO

| EFSA (2018)		IPCC (2010)		NATO (2016)	
Probability term	Subjective probability range	Term	Likelihood of outcome	Verbal statement	Numerical assessments
Almost certain	99-100%	Virtually certain	99-100%		
Extremely likely	95-99%				
Very likely	90-95%	Very likely	90-100%	Highly likely	More than 90%
Likely	66-90%	Likely	66-100%	Likely	60-90%
About as likely as not	33-66%	About as likely as not	33-66%	Even chance	40-60%
Unlikely	10-33%	Unlikely	0-33%	Unlikely	10-40%
Very unlikely	5-10%	Very unlikely	0-10%	Highly unlikely	Less than 10%
Extremely unlikely	1-5%				
Almost impossible	0-1%	Exceptionally unlikely	0-1%		

Her er slik de tolkes av deltagere:

What do you think is meant by these expressions? (Budescu, Broomell & Por, 2010)
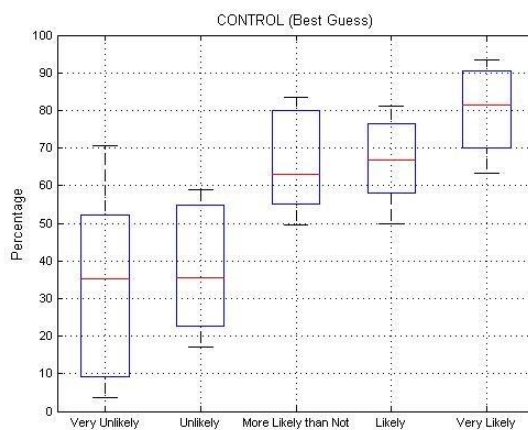
Det er også et poeng at variasjonen mellom individer er stor, så verbale sannsynligheter kan tolkes veldig forskjellig – ikke bare forskjellig fra hva de betyr, men mellom personer. Andre ting vi kan se for oss at de svarer er at verbale sannsynligheter er en slags framing som har en direksjonalitet som tall mangler, og affekt heuristikken i risikovurderinger (som kan føre til overvurdering av sannsynligheter). Ekstra poeng hvis de tar frem en alternativ måte å spørre på fra sliden under. Når deltagerne blir spurt om hva disse verbale sannsynlighetene betyr i timer (og ikke prosenter) så gir de rimelige svar, for eksempel for «unlikely» valgte 57.7% av deltagerne antall timer over maximum på 3.5 h, og 30.8% valgte det øverste (3.5 h) – dette er i tråd med slik usannsynlig brukes (skal bety ca. 5 % ifølge tabellen deltagerne så).

Verbale sannsynligheter i praksis:
Levetid for computerbatterier

- A sample of computers of the brand "Comfor" were tested to check how long the batteries last before they need to be recharged. The figure below shows how many batteries lasted how many hours (duration is rounded to the nearest half hour).
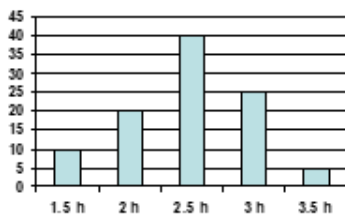
- Based on these results, what is natural to say? Complete the sentences below in a way that seems natural in this context

- (a) The battery in a Comfor computer will last for _____ hours.

- (b) The battery in a Comfor computer can last for _____ hours.

- (c) It is certain that it will last for …… hours

- (d) It is possible that it will last for ….. hours

- (e) It is a chance that it will last for ….. hours

- (f) It is unlikely it will last for .. hours

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3. Diskuter analogisk problemløsning og anvendelsen av analogisk problemløsning.

3. Discuss analogical problem solving and its application.

For the first question, students have to define what an analogy is (structural similarity) and discuss the problem of transfer (spontaneous transfer versus informed transfer), best with the example of Gick and Holyoak's study. Applications include education (e.g., physics) and conflict resolution.

Her er en lenke til læringsmaterialet som foreleser benyttet. Vi forventer ikke at du ser på den, men har inkludert den tilfelle det er nyttig. Det tar 10 min og du kan velge å bare se delen om analogisk problemløsning.

https://rise.articulate.com/share/lFbVYsxNRHgRWPixUEiO-aTmKNgaorMU#/

4. Beskriv de sentrale aspektene ved Greenes dual-prosess modell for moralske bedømminger og forklar hvordan modellen forklarer forskjellene i beslutninger mellom den personlige/gangbroen (personal/footbridge) og den upersonlige/tilskuer (impersonal/bystander) versjonen av tralle-dilemmaet (trolley dilemma).

4. Describe the central aspects of Greene's dual-process model of moral judgment and explain how the model explains the differences in decisions the differences in decisions between the personal/footbridge and the impersonal/bystander version of the trolley dilemma.

The student's response needs to elaborate on the following three components for an excellent result:

1. **The student describes Greene's dual-process model:** Greene's model is based on a dual-process view of human thinking and suggests that moral judgments/decisions are based on two types of processes:
    a. Intuitive /emotional (type 1) processes
    b. Controlled/deliberative (type 2) processes
2. **The student describes the differences in decisions between the personal/footbridge and the impersonal/bystander version of the trolley dilemma that are typically found:** When studying decisions in the trolley dilemma, the typical finding (e.g., Hauser et al., 2007) is that in the impersonal/bystander version of the dilemma (pulling a switch to change the track of the trolley) individuals typically prefer to sacrifice one person to save many persons (i.e., consequentialist/utilitarian choice), while in the personal/footbridge version (pushing a large person of the bridge to stop the trolley) of the dilemma, individuals typically prefer to not sacrifice one person to save many (i.e., deontological choice). *Students need to broadly describe the differences in decisions by <u>either</u> describing the preferences (e.g., sacrifice one to save many), referring to the choice categories (consequentialist/utilitarian vs. deontological), or describing the content of the different choices (e.g., pushing a large person from a bridge). They don't need to describe the content of the dilemmas. They can get extra points if their response is more comprehensive.*
3. **The student explains how Greene's model explains these differences:**
    a. The personal/footbridge version of the trolley dilemma elicits strong emotional responses (towards killing a person by pushing the person from the footbridge). These emotional responses (Type 1) overwhelm deliberate reasoning processes (Type 2). Consequently, individuals to prefer the deontological choice ("don't kill").
    b. The impersonal/bystander version of the dilemma elicits weaker emotional responses (Type 1) and deliberate reasoning processes (Type 2) dominate. Consequently, individuals prefer the utilitarian/consequentialist choice ("saving many is better than saving few").