GENERAL INSTRUCTIONS FOR THE EXAM

Written Exam Perceptual-Motor Learning

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Wednesday, 19th December 2012

1. On EACH response sheet, write your NAME and STUDENT NUMBER
2. The exam consists of 12 questions. Read the questions carefully. Notice, you will often be asked to provide an explanation of why you gave the answer you did, don't forget!
3. Answer the questions as clearly and concisely ('beknopt') as possible. Only answer the question, irrelevant digressions may lead to a subtraction of points.
4. For each question, the number of points that will be awarded for a correct answer is given between brackets.
5. The exam starts at 8.45 am and ends at 11.30 am.
6. The exam hall cannot be left before 9.15 am or after 11.00 am.
7. The answers will be provided on Blackboard after the exam.
8. Good luck!!

John

PS. Enjoy your holidays, but do not forget to submit your Essay!

Note: The answers are provisonal, alternative answer/explanations may also be (partly) correct.

Question 1
Variability during practice is hotly debated among researchers. In this respect, an important phenomenon is the contextual interference effect. Describe the contextual interference effect. In your answer, also refer to the retention test. (10)
Contextual interference refers to the phenomenon *that random order of in practicing different tasks (e.g., ACB ABC BAC etc) leads to worse performance during practice, but better performance during retention (i.e., enhanced learning) than practicing the tasks in blocks (eg. AAA BBB CCC etc).*

Question 2
Another method to increase variability during practice is differential learning. Would the proponents of differential learning encourage the use of feedback about the movement pattern (i.e., knowledge of performance)? Explain your answer. (10)
Differential learning strives to enhance variability of movement performance during practice, because they argue that what should be learned is not a typical, or optimal, movement pattern, but the capability to solve a movement problem (which always differs from one situation to the other, i.e.,is never identical). Feedback in the form of KP is provided with the aim to correct, shape or improve the movement pattern of the learner in such a way that it will resemble a typical, optimal movement pattern produced by an expert. This contradicts the aims of differential learning. Hence, proponents of differential learning would not promote the use of KP.

Question 3
The ecological approach to perception and action distinguishes attunement and calibration as processes of learning. Provide a brief description of both processes. (10)
Education of attention (or attunement, convergence) denotes a change from a less specifying (or less useful) to better specifying (or more useful) informational variable.
Calibration refers to an adjustment of the linkage between movement and informational variables (a change in the constants) without changing the movement or information variable.

Question 4
Dicks, Button and Davids (2010) report inter-individual differences in the visual control of intercepting a penalty kick in soccer. Do these differences better reflect differences in attunement or differences in calibration? Explain your answer. (10)
Dicks et al (2010) report that goalkeepers differ in when they initiate their dive (dependent on how agile or fast they are). These differences in timing allow for the pick up of different informational variables specifying where the ball will go. Hence, these differences point to differences in attunment.

Question 5
Dicks, van der Kamp, Withagen, and Koedijker (2012) argue in favour of an ecological approach to the learning of perception and action in sports. In doing so, they provide a critique of the information-processing or cognitive approaches that –according to Dicks et al.- allow for the investigation or training of perception in isolation from action. Explain why the

independence of perception and action logically follows from these representational approaches. (5)
These representational approaches presume that perception and action are supported by a series of successive sequential processing stages, including an input (perception), transformation (decision making), and output (action). Because these processing stages function largely independent of each other, you can study/train one in isolation (or without consideration) of the other two stages.

Question 6
The common coding approach can be considered a representational approach. Explain why. (5)
The common coding approach is a representational theory, because it postulates internal mental representations (in common coding 'parlance' these are called codes) that function as an intermediate between environment and organism to account for perception and action (i.e. interactions of the organism with its environment). In fact, by proposing event and action codes in addition to more traditional sensory and motor codes, the common coding approach posits in additional level of representation.

Question 7
Describe the motor familiarity hypothesis and explain how it can be derived from the common coding approach. (10)
The motor familiarity hypothesis holds that perception of actions performed by others is more accurate when the performed action is part of the observer's action repertoire. The reason for this is that there are common codes for perception and action (i.e., the event and action codes that partly overlap). Improving one of these codes (eg action code) thus automatically implies an improvement of the other code (eg event code).

Question 8
Aglioti, Cesari, Romani and Urgesi (2008) compared basketball athletes, coaches and reporters, and novices on a perceptual anticipation task in order to put the motor familiarity hypothesis to the test. Explain the authors' rationale for comparing these three groups of participants. (5)
Aglioti et al (2008) used this group because they the athletes would have the same visual experience as the coaches and journalist, but have more motor experiences. Novices on the other hand, would have both less visual and motor experience. Hence any difference in perceptual anticipation between the basketball athletes and the coaches and reporters can only be accounted for in terms of motor experience (and not visual experience).

Question 9
What would be an alternative experimental paradigm to test the motor familiarity approach? (5)
Self-other paradigm

Question 10
In the control-based learning theory, Willingham distinguishes three control principles. Describe the principle of disparate representations. (5)
The principle states that the different control processes (i.e. strategic, perceptual-motor integration, sequence, dynamics) are supported by different type of representations, i.e., they

encode the environmental/movement targets in different ways (i.e., allocentric, egocentric and muscle activation patterns).

Question 11
A golf trainer intends to reduce the likelihood that the performance of her pupils will decrease in situations of high pressure. Following the work from Masters she prefers an implicit to an explicit learning process. According to Masters, what is the process that underlies performance breakdown under pressure, and why would implicit learning reduce the likelihood of performance breakdown under pressure relative to explicit learning? (10)
According to Masters, the occurrence of decrements of performance in situations of high pressure (relative to non-pressure situations, such as practice) is a consequence of a process called reinvestment, the propensity to manipulate explicit knowledge in working memory to consciously guide actions. Reinvestment leads to a de-automatization of the movement, increasing the likelihood of errors. Because during implicit learning less explicit knowledge is accumulated, the likelihood to re-use or re-invest this knowledge is much lower, and hence, the chances of choking under pressure diminish for implicit learning compared to explicit learning.

Question 12
To reduce the likelihood of performance breakdowns under pressure, the golf trainer from Question 11 instructs her pupils during practice to focus attention on the motion of the clubhead. Based on the similarities and differences between, on the one hand, the dichotomy of explicit versus implicit learning and, on the other hand, the dichotomy of learning with an external versus an internal focus of attention, would you predict that her pupils will show performance decreases under high pressure in comparison to players that received explicit instructions and to players that received a dual task training? Explain your answer. (10)
During both internal and external focus of attention learning attention is directed toward task-relevant information. In other words, for both these types of learning the learner is likely to accumulate explicit knowledge (consciously) about the facts and rules of the movement/task, the only difference being in the nature (content) of this knowledge. This makes them both forms of explicit learning, where motor learning is achieved by consciously accumulating knowledge about the rules and facts of the movement and task. This contrasts with implicit learning, during which the accrual of knowledge is prevented as much as possible. According to the re-investment hypothesis, the likelihood of choking under pressure is a function of the amount of knowledge accumulated. Hence, external focus of attention learning is likely to lead to higher chances of choking under pressure than dual task learning (which is a form of implicit learning). Whether or not eternal focus of attention learning will lead a increased or decreased chance of choking under pressure relative to explicit learning is not a priori clear. In both cases explicit knowledge is accumulated, hence both would susceptible to choking under pressure, the degree to which may be dependent on the amount of knowledge that is obtained during learning. This is foremost an empirical question, i.e, it needs to be tested [Yet, work form Poolton et al. 2008, suggest external focus learning may indeed result in less explicit knowledge.]