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A problem solving approach to visceral learning

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NM words, however, they were presented separately. M words from the first night, that gave strong and consistent K-complexes, were paired with NM words that produced minimal K-complexes. During the second night, the paired M-NM groups were presented; however, during the later part of the night only NM words were given. Subjects received only NM words on the third night.

Preliminary results may indicate that subjects show an increase in number and quality of K-complexes on the third night rather than the first night of NM presentation.

20. Tharp, V. K., Moskowitz, H., & Burns, M. (Southern California Research Institute, Los Angeles) **Circadian effects on alcohol gaze nystagmus.** Lehti (1976) reported a highly significant correlation ($r = -.76$) between the angle of onset of alcohol gaze nystagmus (AGN) and the blood alcohol concentration (BAC). We have been able to confirm this observation in both between subject and within subject designs. Thus, visually determined angle of onset of AGN appears to be an excellent sobriety test for police to use. Many stops of intoxicated drivers occur after midnight, however, so circadian modulation of AGN could be very important.

Ten moderately heavy drinkers, between the ages of 22 and 30, volunteered as subjects. Each subject was tested under four conditions: 1) between 8 a.m. and 6 p.m. with no alcohol; 2) between 8 a.m. and 6 p.m. at a maintained BAC of .10%; 3) between 7 p.m. and 4 a.m. with no alcohol; and 4) between 7 p.m. and 4 a.m. at a maintained BAC of .10%. The order of the sessions was randomly selected, except for adjustments for 3 subjects who were unable to run the early a.m. alcohol shift on particular nights. Each session was separated by 3 days. Two observers independently scored the angle of onset hourly using a rotating fixation light mounted on a protractor with a chin rest. The maximum angle of lateral deviation was scored when no nystagmus was seen.

The data were divided into 4-hr segments and analyzed with a fully-repeated ANOVA with the factors of time and alcohol. Alcohol significantly decreased the angle of onset by approximately 15°. In addition, there was a significant alcohol by time interaction in that after midnight alcohol decreased the angle of onset by approximately 20°.

21a. Roberts, L. E., Williams, R. J., & Marlin, R. G. (McMaster University, Hamilton, Ontario) **A problem solving approach to visceral learning.** An earlier paper in this series depicted visceral learning as a problem in concept identification in which subjects seek information about the visceral target (Roberts, Williams, Farrell, & Marlin, 1979). Concepts pertaining to this target are based initially upon procedural details of training and are modified as feedback identifies instances of the desired response. Evidence for this view was sought by examining verbal reports for the information about target responding that is presumably the product of a concept identification process. Accurate self-report was observed when subjects were successfully trained to produce either: 1) an increase and decrease in heart rate, or 2) lateralized changes (L > R and R > L) in skin conductance. Control of the response in the absence of accurate self-report was not observed in either training condition.

The present paper describes an extended framework for the study of learning mechanisms. In this approach, a task statement is assumed to establish a problem space within which visceral learning proceeds. Major components of this space include: 1) a representation of task objectives, 2) initial concepts concerning effective strategies derived from the task statement and the subject's personal history, and 3) a processing system which is organized to acquire information about the response from feedback events. The processing system is seen as a construction which is determined uniquely for each learning procedure by processing requirements that are implicit in problem structure. The system organizes memory to receive information about the response and codes this information in a manner appropriate for production of the target in accordance with performance requirements of the task.

This analysis suggested that within-subject training for two visceral targets with a transfer requirement (as in Roberts et al., 1979) might have favored identification of differences rather than similarities between the targets and encoding in a manner appropriate for recall without feedback as a retrieval cue. Consequently accurate self-report was assessed as a function of forewarning of transfer when subjects were trained to produce a single target alone. The purpose was to determine whether a problem-solving approach might identify processing conditions that favor veridical self-report following training on a feedback task.

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21b. Roberts, L. E., & Keleher, B. (McMaster University, Hamilton, Ontario) **Task statement as a determinant of visceral control and discrimination.** Keleher and Roberts (1979) explored the state of the subject's knowledge of variations in skin conductance by assessing sudomotor discrimination following feedback training for this response. Only subjects given prior experience with feedback for skin conductance successfully identified increases in this response during the discrimination test. However, while successful discrimination indicated that knowledge of the response was present, the relationship of visceral control to discrimination was not significantly different from zero within groups that were given prior feedback training. This contrasted with evidence from earlier experiments in which knowledge of the response was assessed by verbal report (Roberts, Williams, Farrell, & Marlin, 1979). In that research, control of the visceral target in the absence of accurate self-report was not observed in any training condition.

Explanation of the relationship between discrimination and control apparently requires a better understanding of the processes involved in performance on these two tasks. One approach to this understanding derives from the idea that the task statement (verbal instructions, physical arrangement, procedural details, etc.) given to a subject at the outset of training establishes a problem space within which visceral learning and discrimination proceed. Experience with feedback in the Keleher and Roberts experiment may have provided information about dis-