

THE EFFECT OF FOOD DEPRIVATION ON CARDIAC RESPONSE AND SUBJECTIVE RATING DURING VISUAL ATTENTION

Arne Collen

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Abstract

Heart rate has been reported to decrease during attention to environmental events, assuming attention being uncomplicated by requirements of cognitive work and energetic motor activity. The explanatory association between cardiac deceleration and external attention is strengthened by the recent finding that the greater the attention-value of a stimulus, the greater the deceleration it produces. But attention to specific environmental events is a function of the perceiver's motivational state as well as of stimulus properties. Hence cardiac decelerations during the viewing of a class of objects should be greater when the subject is motivated to perceive them and less great when he is not so motivated.

Forty male college students served as subjects. Semantic differential ratings by an additional 101 students from the same subject pool permitted selection of 48 color pictorial stimulus slides divided into two series, each consisting of 12 appetizing pictures of food and 12 nonfood pictures. The slides in the two series were matched on attention-value ($\rho = .90$). Each slide was preceded by a control slide, matched for luminous flux, consisting of five yellow-amber dots on a gray background.

Subjects were shown one slide series when hungry and the other when satiated. Hunger conditions and slide series were counterbalanced and the contingency between conditions and slide viewing was apparently successfully disguised. Each slide was shown for 15 seconds, during which the subject's EKG was continuously recorded. Subjects then rated the slides on a 12 item semantic differential, including 4 Attention-Interest and 3 Pleasantness scales. Cardiac analyses were based upon the algebraic differences between mean heart rate during experimental and control slides.

Results showed (1) the pictorial slides, as compared to control slides, produced a significant deceleration ($p < .05$). (2) The higher a slide was rated on Attention-Interest, the more deceleration it produced ($p < .025$). (3) Subjects' ratings showed a striking difference between food and nonfood slides under hunger compared to satiation ($p < .001$), that is, subjects rated food slides as much more interesting and more pleasant than nonfood slides when hungry than satiated. (4) Subjects' heart rates showed no differences approaching significance between food and nonfood slides under hunger as compared to satiation conditions.

Interpretation of the failure to find greater cardiac decelerations to food pictures by hungry subjects draws on recent findings that more interesting pictorial stimuli produce greater deceleration, but more pleasant ones produce less deceleration. If the heart were responsive to the attention-value of an external stimulus alone, the results would be difficult to explain. Implications for theories of the Laceys and others are discussed.