

The Repetitive Element in the Diet

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DR. BROŽEK has expressed the hope that the symposium will answer two questions, (1) "What's cooking?" and (2) "Where do we go from here?" With this in mind, I should like to review a series of studies, all of which are concerned, directly or indirectly, with the problem of monotony as it is found in the human eating situation. The time and space allotted dictate the omission of detail and a brevity of style that invites communication failure. The risk is taken with the conviction that the objectives of the symposium are best realized by throwing into the hopper as many ideas as possible.

First, let me summarize the results of what might be termed our basic study of eating monotony, an experiment in which 79 college men subsisted for a period of 22 days on a repetitive diet consisting of but two alternate daily menus. Several hypotheses were examined in this experiment. They may be stated briefly as follows. *Monotony is positively related to the number of times a given food item has been consumed. In time, this effect dissipates very slowly or not at all. High initial acceptance slows the growth of monotony. The course of monotony is affected by certain personality factors. And finally, monotony is overtly*

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expressed in lowered food acceptance. It is readily apparent that monotony is being treated here as an intervening variable in the original Tolman sense,¹ related antecedently to the number of times a food item has been ingested, to its initial acceptance level, and to certain personality characteristics. Behavioral symptoms or consequences may be seen in rating scale changes,² in an increase in the amount of uneaten food, and in the refusal to eat.

The following findings lend considerable weight to the original hypotheses:

- (1) When a food item is repeatedly eaten, its palatability rating declines.
- (2) This decline is greater for ratings assigned by individuals who elect early to discontinue a repetitive diet.
- (3) The amount of food left uneaten is greater for individuals who elect early to discontinue a repetitive diet.
- (4) Following a decline in the palatability ratings assigned to items comprising a repetitive diet, no recovery to original rating levels comes about with the passage of three to six months' time.
- (5) Items of a repetitive diet having an initially high palatability rating show less decline in rating than those rated low initially.
- (6) With repeated ingestion, the amount eaten is greater for food items that are rated high initially.
- (7) Individuals who assign initially high palatability ratings to items of a repetitive diet will voluntarily persist longer in eating the diet.
- (8) Various items comprising a repetitive diet differ in palatability rating decline.
- (9) The Otis Test of Mental Abilities and the Minnesota Multiphasic Personality Inventory do not predict period of voluntary participation in repetitive eating.



(10) The amount of food left uneaten correlates significantly with palatability rating.

A second study, quite similar in design, is presently underway. The intent is to examine the generality of the above findings. Different menus are being employed and the study provides for comparative analyses among selected canned, frozen, and dehydrated items. Risking later contradiction, it appears at the moment that the original findings are independent of food item type and specification. There is also some reason to believe that dehydrated items are more susceptible to the monotony effect than the canned or frozen counterparts. It is unhappily true that the preparation of dehydrated items is, in part an art. Had the experimenters employed Escoffier as collaborator, the dehydrated items might have suffered less invidious comparison.

What has been herein termed the monotony effect possesses the characteristics of a habit, albeit a negative one. This line of thought introduces the question of where learning enters the picture. It also suggests that we may be concerned here with a narrow aspect of the much broader question of how, in general, we account for the cessation of eating. Certainly our knowledge of internal regulation does not fully explain this behavior.

Professors Richter and Young will surely attest to the fact that the induction of eating is in great part governed by external stimuli. The approach, seizure, and ingestion of food by the adult organism is largely a matter of conditioning, or if you wish, it is a learned response. Incidentally, if this position is pressed to its limit, there is generated the intriguing implication that despite the presence of food, the adult organism will starve to death in a constantly changing environment. It seems entirely proper to inquire if the cessation of eating is also governed, in part, by external stimuli. We postulate that a stimulus pattern consistently associated with the cessation of eating will take on the capacity to evoke stopping eating. It is an obvious implication of Guthrie's contiguity principle.³ It follows immediately from Hull's conditioned inhibition postulate.⁴ It might even be argued from strict reinforcement theory that the cessation of

eating more nearly coincides in time with primary reinforcement (the assimilation of nutrients) than does the seizure and ingestion of food. Thus the impulse to cease eating could be more strongly conditioned to the total stimulus situation than the impulse to start eating. This is viewed as a testable hypothesis, and at this writing an exploratory study has been conducted.

We have fed 12 men a repetitive diet in an undeviating routine for a period of 24 days in an effort to build up a strong association between a relatively constant environmental situation and the act of ceasing to eat. On the twenty-fifth day, when the subject reported for supper, he found his place at the table looking much the way it had been when he had last finished eating that particular meal. We had carefully simulated the "look" of used dishes, cutlery, etc. to approximate the visual complex which had been repeatedly associated in the past with the cessation of eating and the condition commonly referred to as satiety. An apology and an excuse were offered the subject and he was invited to sit down in his customary place. Following a delay of two or three minutes, the "used" dishes were removed and replaced dish for dish with the familiar fare. This procedure was repeated on the succeeding evening. If the clinical intuition of an experimentalist may be trusted, the subjects experienced no suspicion of chicanery. No eyebrows were raised. All subjects seemed to accept fully the excuse that another group had been fed earlier.

The records of food intake for the two experimental suppers were pooled and compared with the records of intake for the corresponding "normal" suppers eaten on the immediately preceding and the immediately succeeding evenings (ABBA order). Confirming the hypothesis, food intake for the experimental suppers was mildly but significantly depressed with respect to both bulk and calories. We are now engaged in replicating this study with the pessimism of the man who wears both suspenders and a belt. The second replication may average our results to a zero difference.

Certain controls are lacking in this study and they should be discussed here. As opposed to



learned inhibition, the observed diminution may be attributed to the disturbance of the positive eating response. Perhaps the disruption in the usual routine simply weakened this habit much as the dog's conditioned salivary response is weakened with an incomplete presentation of the exciting stimulus. This was imperfectly controlled. Less disruption of routine was introduced at the control suppers. Also of some concern to this investigator is the absence of a control for "nausea." It may be objected that we are here observing a kind of revulsion arising from the sight of "dirty" dishes. To this point it can be said that the subjects had viewed this scene on many occasions although never immediately before eating. It is also true that the concept of "nausea" is in need of some semantic clarification. If the intended meaning is that of mild aversion to eating, perhaps we are merely employing a different term to describe learned inhibition. If the extreme sense of positive physiologic upset is intended, a control may be found in the results, for no subject showed the profound effect upon intake dictated by this interpretation. Better controls for both habit disruption and "nausea" are planned for the near future.

Finally, let me summarize a recently completed pilot study which stems from the somewhat idle question of what one means when he says, "I am hungry." Or, "not hungry." Or, "tol'ably hungry." Is the individual really sensation oriented in the Cannon-Carlson sense, or is his report strongly influenced by the contemplation of eating a particular food item or

items? We have asked a small group of subjects to rate their hunger on a five point scale immediately before eating a strange meal (unknown menu) and immediately before eating a familiar meal. These ratings have been correlated with actual food intake and with palatability ratings obtained following the meal. Although not statistically reliable, the results are encouraging enough to justify a systematic study. In the absence of foreknowledge of the menu, "hunger" correlates about equally with intake and with palatability. When the menu is known beforehand, the correlation with palatability is considerably higher.

It does not seem inappropriate to close this paper with a question or two. Is eating monotony a kind of cultural overlay? Is it peculiar to our western civilization and, possibly, the economy of plenty? One can readily find apparent instances of entire ethnic groups subsisting upon essentially repetitive or monotonous diets. Is eating monotony a particular expression of the broader tendency to seek, sooner or later, variation in an activity? An affirmative answer to these questions carries with it the conviction that ultimately the monotony effect will "fit" into learning theory.

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