

Evaluative Processing of Food Images: The Role for Viewing in Preference Formation

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(食物画像の処理：嗜好における視覚の役割)

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論 文 内 容 の 要 旨

Evaluative processing is one of the most basic and pervasive types of human information-processing. The present thesis aims to investigate the cognitive mechanisms underlying evaluative processing. More specifically, the aim of the current work is to elucidate the role of viewing in preference formation.

Previous research has suggested that viewing plays an important, possibly even causal, role in developing a liking or a preference for any visual item. Particularly, the work of Shimojo and colleagues (2003) established the existence of the so-called “gaze cascade” phenomenon. This phenomenon was confirmed by a wealth of research using many different types of visual stimuli. By this phenomenon, it is known that the gaze tends to exhibit a bias toward a visual item that will be chosen later. Thus, the gaze is thought to express and promote the preference formation. Viewing an item longer would lead to developing a stronger liking for it.

However, the gaze cascade research is exclusively based on forced-choice tasks in which subjects are required to indicate a preference for one among two or more simultaneously presented items. As such, it is possible that the purported relation between viewing and liking is limited to relative evaluation, in which one item needs to be compared directly to another.

Moreover, when visual items are in direct competition, it is possible that any gaze bias is due to movement preparation toward one item rather than another, independent of any evaluative aspect. Therefore, in order to establish that viewing really does express and promote preference formation in general, it is necessary to test the relationship in conditions of absolute evaluation, with single images, avoiding any confound between liking and movement preparation.

The current study was designed to study the relation between viewing and liking using single visual items – in this case, naturalistic food images. The evaluative processing of single exposed naturalistic food images was examined in a 2 x 2 design, conducted completely within subjects, varying both the type of exposure (self-paced versus time-controlled) and the type of evaluation (non-exclusive versus exclusive).

The manipulation of the type of exposure was used to examine the role of self-determination of viewing time. The manipulation of the type of evaluation was used to examine the role of opportunity costs in evaluative processing.

The results of the first set of experiments showed significant relationships between viewing and

liking only in self-paced conditions, when subjects could determine the viewing time. Moreover, in these self-paced conditions, the actual relationships changed depending on the type of evaluation. In exclusive evaluation (with a limit on the number of items that can receive a positive evaluation), the “yes” choices were associated with longer viewing times. In contrast, in non-exclusive evaluation (without a limit), the relationship between viewing and liking was characterized by an inverted-U shape, with the shortest viewing times for the most positive evaluations.

The second set of experiments was conducted as a follow-up to disambiguate two alternative explanations for the differing patterns that were observed with the exclusive versus non-exclusive tasks in the first set of experiments. According to one explanation, the difference was due to the nature of the task. Exclusive tasks would lead to longer viewing times for positive evaluations because they involve an extra commitment with respect to potential opportunity costs (i.e., the cost associated with no longer being able to choose other options). Non-exclusive tasks do not have opportunity costs, so positive evaluations can be based on very brief viewing times.

According to the alternative explanation, the differing patterns were due to the number of response options in the first study (five options in non-exclusive tasks versus two options in exclusive tasks). By this interpretation, the exclusive tasks did not afford an opportunity to observe an inverted U-shape because there were only two options, forcing people to extreme options.

To disambiguate the two explanations, the second study used three response options for both exclusive tasks (put it, wish list, or leave it) and non-exclusive tasks (rating from 1 to 3). The results showed similar patterns with inverted U-shapes in the exclusive as well as the non-exclusive tasks, suggesting that extreme evaluations are associated with short viewing times, whereas moderate evaluations are associated with longer viewing times.

Taken together, the two studies proved that the relationship between viewing and evaluative processing is more complicated than suggested in earlier studies using forced-choice procedures. The self-determination and the framing of response options have a crucial impact on the relationship between viewing and evaluative processing. Future research can benefit from the current paradigm to examine the generalizability and the underlying neural mechanisms of the present phenomena.

Key-words: gaze duration, viewing time, self-paced versus time-controlled, non-exclusive versus exclusive, evaluative processing, naturalistic food images