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Research report

Non-competitive liking for brands. No blocking in evaluative conditioning

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ABSTRACT

In the first experiment, we demonstrated evaluative conditioning using a novel across-modality procedure in which pictorial abstract brand logos acted as conditioned stimulus (CSs) and self-selected foods of different hedonic valence functioned as unconditioned stimuli (USs). We then investigated whether this form of learning of likes discriminates against redundant CSs using a blocking paradigm in the second experiment. The strength of evaluative conditioning accruing to the target CSs during compound training was unaffected by whether the other element of the compound was pretrained with a hedonic US. The observation that contingency learning about the target CS was blocked by the pretraining suggests that learning of likes and predictive learning are mediated by different processes.

Introduction

Food intake is influenced by the hedonic evaluation of both the to-be-eaten food and food-associated stimuli. In other words, people do not only eat the food they like, but are also biased by affective cues related to the foods. The affective potency of such cues is largely learned through experience and one form of experiential learning comprises evaluative conditioning. Evaluative conditioning is the process of learning to like (or dislike) objects and features of the environment as a result of their association with attractive (or aversive) events. For instance, when potential homebuyers visit a property in California, some agents apparently bake bread in the house before the client arrives, thereby filling the rooms with highly pleasant scents from the oven, in the hope that the liking will transfer to the property itself. Such examples of evaluative conditioning depend on successful pairing of two stimuli—the initially neutral conditioned stimulus (CS), the property, and a hedonic unconditioned stimulus (US), the smell of baking bread. Although such evaluative conditioning resembles standard Pavlovian conditioning procedurally, a number of authors (e.g. Baeyens & De Houwer, 1995; Martin & Levey, 1978) have argued that different learning processes mediated these forms of conditioning. The purpose of the present studies was to investigate whether evaluative conditioning is sensitive to one of the major determinants of Pavlovian conditioning, blocking.

A cardinal feature of Pavlovian conditioning is that only surprising or unexpected USs support learning, which is most succinctly illustrated by the blocking effect (Kamin, 1969). Blocking is observed when the amount learned about a cue is attenuated or blocked by the presence of another cue that has been pretrained as a predictor of the same outcome. This cue competition effect can be illustrated by imagining drinking a novel and refreshingly palatable soft drink, Mezzo (US), which has a distinctive logo on the bottle (target CS), which itself has a shape that is similar to that of an established, attractive soft drink (pretrained CS), for example Pepsi. If blocking were to take place, then the presence of the Pepsi-shaped bottle would predict the positive affective reaction to the drink US and therefore block the acquisition of liking (evaluative conditioning) to the novel Mezzo logo.

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Although blocking has been demonstrated in a number of human conditioning paradigms, such as electrodermal (Hinchy, Lovibond, & Terhorst, 1995), and eyeblink conditioning (Martin & Levey, 1991), the evidence for blocking in evaluative conditioning is mixed. When Dickinson and Brown (2007) pretrained the color of a drink as a predictor of whether it would taste sweet or soapy, the amount of evaluative conditioning to a flavor added to the drink was unaffected by whether its taste was predicted by its color. In other words, prior color-taste learning failed to block flavor-taste learning. By contrast, in a procedure in which visual icon CSs were paired with fruit juice USs, Tobler, O'Doherty, Dolan, and Schultz (2006) reported blocking of the conditioning of a positive evaluation of the icons. Although there are many procedural differences between these two studies, one of the most notable concerns the modality of the CSs and USs. Tobler et al. (2006) used an across-modality procedure, in which the CSs were visual and the USs were gustatory, whereas Dickinson & Brown (2007) used a flavor–flavor, within-modality procedure. Given this difference, the purpose of the present study was to re-examine whether blocking occurs in across-modality evaluative conditioning of the type envisaged by the hypothetical competition between the shape and logo of soft drink bottle.

Therefore, like Tobler et al. (2006), we employed visual CSs and gustatory USs. However, as our procedure differed from that employed by Tobler et al. in a number of respects, Experiment 1 established that this procedure supported evaluative conditioning to the visual CSs before Experiment 2 investigated whether this form of conditioning was subject to blocking.

Experiment 1

A problem with employing gustatory USs is that participants vary greatly in their liking for such stimuli. In an attempt to minimize such variation, we developed a novel procedure in which the participants selected their own highly-palatable hedonic foods to act as USs. At the time of recruitment, the participants were asked to identify their most liked foods in a number of categories and the two that were most liked were chosen to act as the hedonic USs. During conditioning, the opportunity to consume each of these hedonic foods were then signaled by a different CS, which were visual logos (H), before the participants were finally asked to rate their liking for the CSs.

The second change concerned the control CS against which evaluative conditioning is assessed. Tobler et al. (2006) compared the ratings for a CS paired with a hedonic US to one paired with no US. However, this control confounds the hedonic value of the outcome associated with each CS with whether or not the CS is associated with any US. To minimize this confound, we assessed evaluative conditioning by contrasting the change in the liking for the H logos from the initial, preconditioning ratings with those for another pair of neutral CSs (N logos) that signaled neutral USs during conditioning. Evaluative conditioning would have occurred if the positive change in liking was greater for the H logos than for the N logos.

The use of the neutral CS control also allowed us to address a further concern. In addition to assessing evaluative conditioning, we also measured contingency learning by asking the participants to predict on each trial which specific food was associated with each logo CS. The importance of assessing contingency learning lies with the interpretation of any difference in the post-conditioning evaluative ratings for the H and N logos. An interpretation of such a difference in terms of evaluative conditioning attributes the effect to the hedonic valence of the US rather than to a difference in the ability of the particular USs to engage learning processes per se. An assessment of contingency learning therefore allowed us to assess the extent to which any evaluative conditioning was mediated by the impact of the US valence on general learning.

Finally, Tobler et al. (2006) also reported an implicit, reaction time (RT) measure of conditioning by asking their participants register by spatially differentiated responses the location of the CS during training and found faster responding to CSs associated with a hedonic US. As this implicit measure goes someway to validating the explicit evaluative ratings, we also included a spatial RT measure during the assessment of evaluative status of the CSs.

Method

Participants, stimuli and apparatus

Adult volunteers, mainly undergraduates (females: 3; males: 7), were recruited from the Cambridge area and were asked to have a light morning or afternoon meal and then to fast for at least 4 h before the experimental session. Participants were tested individually in an experimental room in which they sat at a table facing a computer screen (PC with a 1280×1024 display; Fig. 1). The program controlling the experiment was written in VB.NET 2008. The volunteers were paid for their participation at the end of the session.

Abstract brand logos (CSs). Four abstract pictures selected from a set constructed by Kuwayama (1973) served as CSs. This source contains a collection of commercial brand logos that are likely to be unfamiliar to the general population and that are utilized in marketing research (Henderson & Cote, 1998). The original black and white images of different shape categories were digitally colored for this experiment to enhance the discriminability of individual images. The CSs were 400 by 400 pixels in size and presented in either the top left- or right-hand side of the screen. The assignment of the pictures to the roles of the H and N logos were counterbalanced across participants.

Food unconditioned stimuli (USs). The hedonic USs were established using a web-based questionnaire during initial recruitment of participants (see http://research.psychol.cam.ac.uk/~kl278/experiments/recruitment.php?StudyID=4). The participants specified six of their most favorite foods from different food categories and then ranked the list, allowing us to pick the two most liked foods to act as hedonic USs. Examples of the hedonic USs are Belgian chocolates, strawberries or different cheeses. The neutral USs, oats and miniwheats, were picked from a pilot study as dry and bland foods that the participants generally rated as moderately disliked. The unit sizes are visible in Fig. 1, as well as the total

Fig. 1. Food US placements with US indicator arrows. Both the hedonic and neutral foods were placed on each side of the computer that presented the brand logo CSs. The arrows were used as US indicators to point to the participants, which food they need to self-administer with a given brand logo. The arrows also represented the four different foods on the surfaces when the participant had to predict, which food a given brand CS was followed by—to measure contingency knowledge.