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Renewal in the Cognitive and Emotional Domains: Comparing Novelty-Facilitated Extinction with Counterconditioning and Extinction

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Supplemental Materials: Raw data

Experiment 1 Raw Data Sheet

Every participant's ID, age, and gender were recorded (in columns A, B, and C, respectively). Prediction ratings between cues and outcomes were measured on an 11-point Likert scale ranging from 0 to 100 incremented in steps of 10. The scale was anchored at 0 (very unlikely) and 100 (very likely) indicating the prediction of how likely a cue was to be followed by an outcome in a specific context (A or B with A being the target training context and B being the context of interference training; hence, ABA or ABB) and showing the impact of counterconditioning (CC), extinction (Ext), and novelty-facilitated extinction (NFE) relative to a control condition (Ctr) of no potentially inferring event in the cognitive domain (row 3, columns D-CU). All participants served in each condition in each of three blocks of conditions, with the order of conditions within a block being randomized. Each condition consisted of a stimulus stream shown to each participant in which stimuli were randomly assigned (without replacement) to each participant and each condition. Cues (X, Y, or Z) were paired with outcomes (POS, NEG, or NEUT with respect to affective value). Each stream of trials consisted of Phase 1, establishing an association between the target cue X and an outcome in context A, and Phase 2, potentially impairing the expression of the Phase 1 target association through interfering training in context B. Each octet of conditions (a block of conditions) was presented three times. After prediction ratings were recorded, the valence ratings of various cues were pitted against each other (X vs. W, X vs. Y, and W vs. Y), where stimulus W was a cue presented as often as X but never paired with an outcome. Preferences for one cue over the other were recorded on a new 11-point Likert scale to assess the relative valence ratings of each stimulus in the different conditions (row 107, columns D-BW) ranging from +5 to +5 and anchored at +5 (a strong preference for one stimuli), 0 (no preference), and -5 (a strong preference for the other stimuli). Finally, the valences of the outcomes were measured to ensure that the valences of the IAPS images used had not been impacted in the study. These outcome valence ratings were measured on an 11-point Likert scale ranging from -5 to +5 and anchored at -5 (very unpleasant), 0 (neither pleasant nor unpleasant), and +5 (very pleasant). Each valence rating was recorded for each image (NEG, NEUT, and POS) in each condition (row 211, columns D-DS).

Unpublished experiment Raw Data Sheet

Following Experiment 1, an experiment was conducted using PROLIFIC participants. It differs from Experiment 1 in that the prediction ratings were only asked for cue X and outcome

NEG to avoid participants from discriminating between various outcomes during the ratings. The prediction ratings were measured on the same 11-point Likert scale used in Experiment 1 in which participants were asked the likelihood of a cue being followed by an outcome in contexts A (condition ABA) or B (condition ABB) for the counterconditioning (CC), extinction (Ext), novelty-facilitated extinction (NFE), and control (Ctr) conditions (column B, rows 6-21). Here, each octet of conditions was presented only twice, rather than three times as in Experiment 1. Because valence ratings of various cues were also requested to assess the impact of these interference treatments in the emotional domain, the order of testing was counterbalanced within-subjects in which half of the streams were concluding by asking for the prediction ratings first while the other half of the streams were concluded by asking for the valence ratings first (column A, rows 6-21). Participants who rated predictions followed by ratings of valences have their IDs highlighted in yellow (row 5), and these remain highlighted throughout the data sheet (rows 28, 45, 62, and 86). A similar 11-point Likert scale was used to measure the valence ratings of stimuli X, Y, and Z (as indicated in column B, rows 29-78) in the different conditions (as indicated in column C, rows 29-78) anchored at 0 (very unpleasant), 50 (neither pleasant nor unpleasant), and 100 (very pleasant) due to a programming error making it somewhat different from that used in Experiment 1. Once again, the order of testing is specified (column A, rows 29-78). The valences of each type of images used, aversive, neutral, and positive, were measured on the same scale as in Experiment 1 (column A, rows 87-208).

Recruitment on Prolific was set to require participants to be UK citizens, native English speakers, and between 18 and 50 years old. They were paid £7.50 for taking part in the study. We aimed to recruit a sample of 100 to allow for comparison with Experiment 1. In the end, 117 participants completed the task, but, as 14 failed the warmup and 4 indicated they were distracted during the experiment (see below), we were left with 99 participants (51 males, 48 females, mean age of 30.93 +/- 8.50, ranging from 18 years old to 50 years old).

The experiment was not reported in the main paper because we found subsequent programming errors that caused the following problems: (a) an outcome was assigned to two different conditions (one in the first block and another in the second block) for most participants. Moreover, the programming error also prevented the program from properly recording the condition to which an outcome had been assigned; (b) As in Experiment 1, the cues, outcomes, and contexts were assigned randomly to each condition at the beginning of the first octet of conditions, but due to a programming error, a new random assignment occurred at the beginning of the second block of conditions, effectively creating randomization with the possibility of replacement across octets; (c) a programming error resulted in cue valence ratings being assessed using a 11-point Likert scale. Specifically, participants were asked to assess the valences of X, Y, and W. Each stimulus was shown in the context in which it had been streamed. Above the image was the question, "How pleasant do you find this picture?" Below it was an 11-point Likert scale ranging from 0 to 100 by 10s, anchored at 0 ("Very unpleasant"), 50 ("Neither pleasant nor unpleasant"), and 100 ("Very pleasant").

Experiment 2 Raw Data Sheet

With only a couple errors in the program being fixed, Experiment 2 was essentially a replication of the unpublished PROLIFIC Experiment 2. Prediction ratings between cues and outcomes were measured on the same 11-point Likert scale as used in Experiments 1 and 2b.

Similarly, the IDs of the participants who were asked to predict the likelihood of an outcome following a cue before being asked the valence of the cue first were highlighted throughout the data sheet (rows 4 and 25), and this order is specified for both the prediction and cue valence ratings (column A, rows 5-20 and 26-75). The cue valence ratings differ from Experiment 2a in that they were measured on the same 11-point Likert scale as the outcome valence ratings ranging from -5 to +5 that was used in Experiment 1. However, the procedure remained the same in which the valences of cues X, Y, and Z (column B, rows 26-75) were measured in each condition and context (column C, rows 26-75). The valence ratings of the outcomes for each type of image used, aversive, neutral, and positive, were measured as in the prior experiments (column A, rows 82-201).