

The Effects of 2-second Learning 12 weeks before on a Recognition Test -The Perspective of the Manner of Study (Incidental Learning Vs. Intentional Learning)-

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Abstract

Using the Indirect Recognition Procedure (Terasawa & Ohta 1993), we examined how performance in a recognition experiment (Session2) was affected by incidental learning 3 months earlier (Session1). In Session 1, participants judged on each presented word whether they had seen it before at a pace of 2-second/word. In Session2, each group of subjects was asked to study a list of words incidentally and then to recognize the words. The test list consisted of those words that had been presented in Session1 and new words. Kitagaki & Terasawa(2005) detected some effects of the encounters in Session1 on the False Alarms in Session 2 with a 3-month interval. On the basis of the results, we examined the effect of the manner of study (incidental vs. intentional) in Session1 on the long lasting effect of memory. Participants were separated into two groups (intentional, incidental). As a result of a two-factor mixed-design analysis of variance (ANOVA), significant effect of the number of repetitions in Session1 was detected on False Alarms, as well as marginally significant effects of interaction on Hits. These results suggest that the manner of study affects the recognition performance with a 3-month interval. In addition, a long-lasting phenomenon of memory was observed.

Objective □ □ □ □

We live through wide-ranging experiences every day; do we store them in some form or do they just slip away? For example, do those English words we learned three months ago in just two seconds remain with us forever?

Terasawa & Ohta (1993) and a series of other researches have uncovered the existence of a long-lasting learning effect, which does not involve conscious recollection. The method of measuring this long-term implicit memory is called the “Indirect Recognition Procedure.” This method has a long-term interval between the learning and the recognition test and analyzes how learning before the interval affects the result of the recognition test.

Among recent studies, Katsube & Terasawa (2004) used the indirect recognition process with an 11-week interval to examine the long-lasting effect of learning in English words on the language acquisition of students.

How intentional memorizing affects the performance of long-lasting phenomena of memory has not been examined in any other previous works.

In this study, we examined these phenomena on the basis of whether participants have awareness or not of the learning phase (in Session1) of 12 weeks before.

Materials and Methods

Experimental Design

The experiment was performed using same procedure and materials in both conditions of manner of study.

The experiment consisted of two sets of sessions with a 12-week interval between the two sessions. In the first session, learning was repeated 0-5 times (six different conditions) as intra-subject factors. The effect of randomly assigned learning item numbers on recognition test results in the second session was analyzed. Interaction was analyzed based on two-factor mixed-design analysis.

Participants

Twenty-four students of Okayama University in Japan
Incidental: 12 students, Intentional: 12 students

Materials

Six-letter English words listed in Terasawa *et al.* (2003) were selected. A total of 233 words with 1.5 – 3.5 points on the familiarity scale, which had been evaluated by more than ten freshmen at national universities, were used. These English words were randomly arranged and divided into twelve sets, each consisting of ten words. To reduce intra-material effects, these sets were counterbalanced and assigned a learning item number: T0, T1, T2, T3, T4, T5, D0, D1, D2, D3, D4 and D5 (T stands for “target” in the recognition test in the second session; D stands for “distractor”; and the numeric numbers stand for the number of the learning item).

The learning list for the first session was prepared containing the words randomly arranged to appear as many times as designated for each set, T1 – T5 (a total of 150 words in the list) and D1 – D5 (150 words).

The learning list for the second session consisted of the words designated as targets in the first session (T0 – T5) and additional 32 filler words (FILLERXT) in a random arrangement. To prevent the influence of the arrangement, five filler words were added each at the beginning and the end of both learning lists (FILLER 1 for the first session and FILLER 2 for the second session).

The test list for the second session included the target words listed in the second learning list, the distractors (D0 – D5) in the first session and 32 filler words (FILLERXD), and all of them were randomly arranged. FILLERXT and FILLERXD were only used for adjustment of the score.

In the first and second sessions, the words were randomized for every participant.

Procedure

The sessions were performed in groups. In the first session, the participants selected for the incidental learning were asked to mark each of the listed words in two seconds with “○” if they had seen the word and with “×” if they had not. The intentional learning group was asked to mark each of the listed word in two seconds with “○” while they memorized the word. This procedure served as incidental learning or intentional learning to be tested in the second session of the indirect recognition process.

In the second session, the participants went through another round of incidental, 2 second/word learning as in the first session. This learning session was immediately followed by the old-new recognition judgment at the pace of the individual participant for the words they had just learned during the second learning session.

Results

The results of the two-factor mixed-design analysis of variance (ANOVA) show marginally significant effects of interaction on Hits [$F(5,110) = 2.12, p < .1$, Fig.1]. Significant effect of the number of repetition in Session1 ms [$F(5,110) = 2.90, p < .05$, Fig.2].

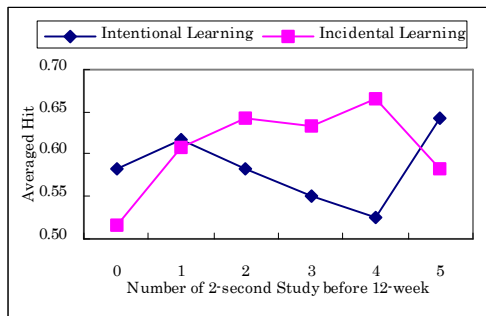


Figure 1: Averaged Hits for the number of studies 12 weeks before

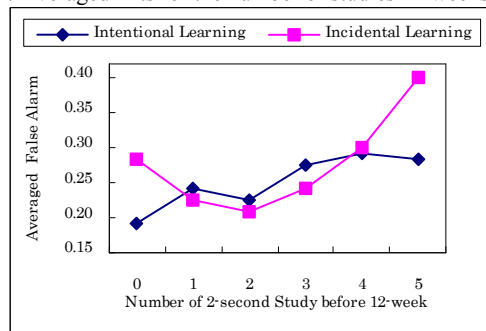


Figure 2: Averaged False Alarm for the number of studies 12 weeks before

Discussion

A Significant effect of the number of repetition in Session1 was detected on False Alarms, and a marginally significant effect of interaction on Hits was seen. These longitudinal effects of memory change according to the length of the interval (Terasawa, 1998). In future, we will include the factor of the interval and examine this manner of study in intra-subject design.

Together, our study showed that 2-second English word learning three month before was maintained for the long term at a level that does not require conscious recollection.

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