

The Effect of Mood on Self-paced Study Time

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Abstract. The present study investigated the effect of mood on self-paced study time. Twenty-eight university students voluntarily participated in the experiment. Half of them listened to positive music and the other half listened to negative music for nine minutes. After self-assessment of mood, they made self-paced study for word-pairs. The results showed that negative and positive mood have not significant effect on self-paced study time.

1 Introduction

Metacognition includes monitoring process and control process [28]. Underlying much of the work on metacognition is a view of the person as an organism that actively monitors and regulates their cognitive processes towards the achievement of particular goals [20]. Allocation of self-paced study time is one of important components in control process [24]. Self-directed learning is central both to everyday memory performance and to achievement in education [5], [17], [29]. There are many factors influence the allocation of self-paced study time, such as the difficulty of item [8], [9], [10], the norm of study [12], [21], [27], the total time available [31], [33], judgments of interest for items [34], and reward benefits [12]. However, there was few research which had been done to investigate the effect of mood on the allocation of self-paced study time.

Mood is often described as diffuse and long-lasting affective states [25]. They are experienced without simultaneous awareness of their causes [4], [6], [9], [30], [35]. According to a recent integrative theory, the mood-behavior model (MBM) [15], moods do not have stable motivational implications, but they can influence behavior through two processes. The relevant process in the present context is the informational mood impact. It means that moods influence evaluative behavior-related judgments and appraisals. Moods can influence these appraisals in terms of mood congruency effects in that people are more optimistic in a positive mood than in a negative mood. These mood-influenced appraisals — which are explicable as the product of an information integration process in which mood, as a piece of information, is integrated with all other available information into a judgment [1], [2], [3], [15] — will result in behavioral adjustments.

The present research deals with the effect of different moods on allocation of self-paced study time. We predicted that negative mood may result the longer time for items because there are higher subjective demand and higher effort-related autonomic activity in negative context than in positive context [16].

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2 Method

2.1 Participants and Design

Twenty-eight university students with various majors (14 women and 14 men with an average age of 21.43 years) voluntarily attended the study and received a small amount of money. Participants were randomly divided into 2 groups. A 2 (mood valence: negative vs. positive) \times 2 (word-pairs difficulty: related vs. unrelated) mixed-model design in which mood valence was between-subject variable and word-pairs was within-subject variable. Both related word-pairs and unrelated word-pairs were used to increase the variability of difficulty across items. The gender was balanced between two mood valence conditions. Dependent variables were self-paced study time and recall performance.

2.2 Materials and Apparatus

Items consisted of 30 paired associates in which 15 were related pairs (e.g., star-sky), and 15 were unrelated (e.g., corn-map). Computers displayed all instructions and controlled all aspects of the word-pairs study procedure. The Computers also recorded participants' responses.

2.3 Procedure

The study was announced as a test about music and words. On arriving at the laboratory, participants were instructed to sit for ten minutes and read newspapers. The purpose was to make them habituate the environment of laboratory and keep calm.

2.3.1 Mood Induction

After the habituation period we introduced the mood introduction procedures. In accordance with the conceptualization of mood as a not object-related state, we did not mention that we were interested in participants' affective reactions and introduced the mood inductions as "tasks" in which we would test their knowledge about the music they would listen. In the music conditions participants received headphones and read "Task 1: Listening to pieces of music." Participants in the music-negative-mood condition listened to a sad China-qin piece (Hu jia shi ba pai, composed by Cai, Wen-ji) for nine minutes. Participants in the music-positive-mood condition listened to 3 easy listening pieces for nine minutes: "Laugh in sea" (composed by Huang Zhan), "Gong and drum for bumper" (composed by Peng Xiuwen & Cai Huiquan), and "Jiu Jiu Yan yang tian" (composed by Gao Ruxing). These pieces of music have been selected by specialists and rated by 30 graduate students.

After the mood inductions, participants received a questionnaire that contained several questions about the music (e.g., "Are you familiar with the pieces of music?" and "What music instruments are the pieces of music played by?"). Embedded into these questions was the mood manipulation check with the Positive Hedonic Tone (happy, joyful, contented, and cheerful) and Negative Hedonic Tone (sad, frustrated, depressed, and dissatisfied) scales of the UWIST Mood Adjective Checklist [23]. Participants rated the extent to which each of the eight adjectives reflected their momentary feeling state ("Right now, I'm feeling ..."). Scales ranged from 0 (not at all) to 6 (very much).

2.3.2 Word-Pair Study

Once participants completed the questionnaire, they received instructions which presented on screen of computer:

We will study 30 word-pairs which will be presented on screen in turn. Each word-pair only will be presented once. When you think that you have remembered the word-pair, you can press space key to study the next word-pair. Please study attentively. After you study all of word-pairs, we will present the first word of every word-pair on screen in turn and ask you to write the correspondent word.

After participants understand the instructions, they began self-paced study. When a participant pressed the space key to begin a given trial, the first item was presented. The item remained on the screen until the participant again pressed the space keys, which result in the presentation of the next item. Study time for that item was operationalized as the time between the presentation of an item for study and the following participant-initiated key press.

Presentation of the last item selected for restudy was followed by a 30-s distractor task, which in turn was followed by paired-associate recall. For each recall trial, the cue of an item was presented, and participants were instructed to either write the correct response down on paper and then press the space key or directly press the space key if they felt that they did not remember the answer. Then the cue of the next item was presented on screen. The presentation order of items was randomized anew. After the final item was presented for recall, participants were debriefed and received their payment.

Before mood inductions, participants made a short practice in order to grasp the procedure of self-paced study for word-pairs.

3 Results

3.1 Mood Manipulation Checks

We created mood scores for each participant by summing the Positive Hedonic Tone scale values with the reverse-coded Negative Hedonic Tone scale values of the UWIST Mood Adjective Checklist (Cronbach's $\alpha = .86$). This way, higher values reflect a more positive mood. The mood manipulation procedure was checked by independent samples t-Test of the self-reported mood rating. The mood manipulation procedure was effective as there was significant effect of mood induction $t(1, 27) = 4.699, p < 0.01$.

3.2 Self-paced Study Time

For each participant, we computed the mean of study time (s) for related word-pairs and unrelated ones separately. Means across individual's mean of study time are reported in the top half of Table 1.

The effect of moods (negative vs. positive) and difficulty of items (related vs. unrelated) on study time were assessed by 2 (moods) \times 2 (difficulty of items) analysis of variance (ANOVA). The main effect of moods was not reliable, $F(1, 27) = 0.774, MSE = 4084772.71$. The main effect of difficulty of items was reliable, $F(1, 27) = 106.831, MSE = 4084772.71, p < 0.01$. Study time was reliably greater for unrelated

word-pairs than for related word-pairs. The interaction between mood and difficulty of items was not reliable, $F(1, 27) = 0.035$, $MSE = 0.853$.

3.3 Recall Performance

For each participant, the proportion of items that were correctly recalled was calculated separately for each item difficulty condition. Means across individual's proportion of correctly recalled items are reported in Table 1.

Table 1. Self-paced study time (s) and recall performance (%)

| | Related word-pairs | | Unrelated word-pairs | |
|-----------------------|--------------------|--------------|----------------------|---------------|
| | Positive | Negative | Positive | Negative |
| Self-paced study time | 4434 (2747) | 3998 (1065) | 8980 (3560) | 8346 (3852) |
| Recall performance | 86.2 (17.47) | 83.8 (14.13) | 51.93 (21.2) | 60.93 (24.67) |

Entries are mean across individual's self-paced study time (s) and the mean across individual's proportion of correct recall performance. Values in parentheses are standard errors of the means.

The effect of moods (negative vs. positive) and difficulty of items (related vs. unrelated) on recall performance were assessed by 2 (moods) \times 2 (difficulty of items) analysis of variance (ANOVA). The main effect of mood was not reliable, $F(1, 27) = 0.256$, $MSE = 13.687$. The main effect of difficulty of items was reliable, $F(1, 27) = 49.682$, $MSE = 5.176$, $p < 0.01$. Recall performance was reliably greater for unrelated word-pairs than for related word-pairs. The interaction between mood and difficulty of items was not reliable, $F(1, 27) = 1.987$, $p = 0.17$.

4 Discussion

The present study investigated mood states' impact on self-paced study time. But we did not find any reliable differences between negative and positive mood. There may be two reasons. First, there are great individual differences about the allocation of self-paced study time. We can see that the standard deviations are high. Second, although we use instructions to prevent the participants knowing our experimental goal, some participants may still guess the real purpose of the music, which can reduce mood's informational impact on subsequent self-paced study. This is because when people know the actual source of their moods, mood congruency effects disappear [7], [14], [18], [19], [31], [32]. We will explore the effect of mood on self-paced study time further by using within-design of mood and more strict control.

In additional, from our results we can see the difficulty of items have significant effect on self-paced study time. People spend more time on more difficult items, which is consistent with the previous studies [12], [21], [26].

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