

Effect of different reference ages on the self-reference task: Memories of past and present self

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Abstract

In this study, two experiments examined whether memory of present self differed from memory of past self. In Experiment 1, participants chose words to describe their past and present selves and were subsequently asked to recall these words. The self-reference effect was exhibited when participants chose words to describe their present selves. In Experiment 2, the task-facilitation paradigm was used to compare memories of the two selves. The facilitation effect was exhibited only when participants chose words to describe their present selves. These results indicate that memories of the past and present self differ, necessitating a new distinction within the self-descriptive task.

All humans occasionally remember their previous selves and are interested in changes within themselves, e.g., "When I was a school child, I was shy; now I am social." Researchers have used various approaches to examine the self; in memory research, self has been examined using the self-reference effect.

The self-reference effect is exhibited in a study when individuals recall more material related to themselves than materials related to semantic or physical features. An operational definition of self reference is to provide explicit instructions for participants to refer to themselves. For example, a study phase may involve participants carrying out three orienting tasks: a self-

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reference task, a semantic task, and a physical task. A typical self-reference task is the type of self-descriptive task described by Klein (1989), during which participants rate how words describing personality traits apply to themselves. During the semantic task, participants rate the difficulty of defining words. During the physical task, participants count the number of vowels in words. After the study phase, participants are instructed to recall the words; participants tend to exhibit better recall of words they rated in the self-reference task than words used in the semantic and physical tasks.

Rogers, Kuiper, & Kirker (1977) was the first to study the self-reference effect. Rogers et al. (1977) used a level-of-processing paradigm to examine the self-reference effect, comparing performance during four orienting task conditions: a structural condition, a phonetic condition, a semantic condition, and a self-reference condition. During the structural condition, participants judged a word's font size; during the phonetic condition, participants judge whether two presented words rhymed; during the semantic condition, participants judged whether two words had the same meaning; and during the self-reference condition, participants judged whether words applied to themselves. After the study phase, participants were instructed to recall presented words; they recalled more words used during the self-reference condition than ones used in any of the other conditions. This performance pattern revealed the self-reference effect. Rogers et al. (1977) theorized that the self acts as a cognitive prototype, functioning as a cognitive reference point to allow a comparison of processes between 'self-reference' and 'other-reference.'

Many studies have examined various aspects of the self-reference effect; these include examinations of the evaluative aspect of the self-reference effect, attempts to explain the self-reference effect using elaboration or organization, examination of the self-reference effect in patients with depression, and comparisons among different self-reference tasks (e.g., Ferguson, Rule, & Carlson, 1983; Ganellen & Carver, 1985; Keenan & Baillet, 1980; McCaul & Maki, 1984), (b) attempt to explain the self-reference effect from elaboration or organization (e.g., Bower & Gilligan, 1979; Ingram, Smith, & Brehm, 1983; Keenan & Baillet, 1980; Klein & Kihlstrom, 1986; Markus, 1977), (c) examination of the self-reference effect in depression patients (e.g., Davis, 1979; Derry & Kuiper, 1981; Ingram et al.), (d) comparison among different self-reference tasks (e.g., Klein et al., 1989). Other many attempts to examine the self-reference effect has been carried out (e.g., Hull & Levy, 1979; Kendzierski, 1980; Lord, 1980).

These studies have generally only used the present self in their examinations. Self-descriptive tasks in particular have usually only involved the present self; i.e., requiring participants to rate words describing personality traits as they apply to themselves currently, not in the past. In sum, knowledge gathered from self-descriptive tasks is knowledge about the present self.

However, the self includes two components: past and present. We are able to recall our personality and self image when we were primary or junior high school students and are also aware of our present personality and self image. This fact suggests that self contains aspects of present and of past. This study applied self-reference techniques to examine whether a better understanding of self was reached when these two aspects of self exhibited different memories or the same memory.

Experiment 1

In Experiment 1, performance during a free recall task compared two conditions: a past self-reference task condition in which participants rated the degree to which words described their junior high school selves, and a present self-reference task condition in which participants rated the degree to which words described their present selves. Performance differences during these two conditions would indicate a difference between past and present self. The experiment also examined whether performance during the free recall task was affected by the length of time that had elapsed between the age referred to during the past self-reference task condition and the present age.

Method

Participants. Participants included 40 undergraduate and graduate students, who were divided in two groups of 20 individuals: a young group (18–19 years old; average age of 18.40) and an old group (22–25 years old; average age of 22.75).

Design. The self-reference task used a 2 (participants' present age: young condition or old condition) \times 2 (reference age during the self-reference task: past self-reference task condition or present self-reference task condition) mixed factorial design. The object of reference in the past self-reference task condition was each participant's self as a junior high school student; the within-subjects variable was each participant's reference age in the self-reference task; and the

between-subjects variable was each participant's age.

Materials. Words describing personality traits were selected from work by Aoki (1971); the 40 selected words were randomly divided into two sets.

Procedure. Experiment 1 involved three phases: study of materials, a distracter task to prevent rehearsals, and a free recall task.

During the study phase, each participant received a booklet listing personality-trait words and rating values. Participants rated the degree to which words described their past or present selves; i.e., they rated how well the words fit themselves. They rated fitness by circling numbers on their rating sheets using a scale of 1 (extremely good fit) to 7 (extremely bad fit). A rating of 4 indicated, "I cannot decide between a good/bad fit." After receiving instructions for the two self-reference tasks, participants practiced each self-reference task five times, after which they actually performed the two kinds of self-reference tasks. These tasks were randomly presented in a different order for each participant. Because this experiment used an incidental-learning paradigm, participants were not informed that they would subsequently be tested using a memory task. After completing the study phase, each participant performed the distracter task, which involved orally presenting four digits (e.g., 1234) and having participants respond by repeating the digits in reverse order (e.g., 4321). Participants performed the distracter task 20 times, after which they performed the free recall task, in which they had five minutes to recall the personality-trait words presented in the study phase.

Results and Discussion

Table 1 shows the mean percentage of correct recall. All analyses described in this paper used a significance level of $p < 0.05$.

A 2x2 (a two way) analysis of variance (ANOVA) was conducted on the percentage of correct recall and revealed a main effect of reference age during the self-reference task; recall was better in the present self-reference task condition than in the past self-reference task condition ($F(1, 38) = 4.38$, $p < .05$). Main effects of participant age and interaction between participant and reference ages in the self-reference task were not significant.

These results indicate that performance during the free recall task was facilitated when materials referred to the present self rather than the past self, suggesting a difference between memories of the past self and the present self.

The length of time elapsed between the past and present self did not affect

performance during the free recall task. This result can be explained in two ways. One explanation is that time elapsed between the past and present self does not influence the self-reference effect; another explanation is that age differences between the young and old group were too small (about four years) to affect results. The validity of these two explanations could be examined by manipulating the age difference between young and old conditions, but because the main purpose of this research was examination of memory differences between past and present self, this issue was not examined further here.

Participants reported on the way they rated during the past self-reference task; they indicated how well words described their past selves according their self image when they were junior high school students. That is, participants did not rate words according recollections of autobiographical experience.

Table 1 Mean percentages of correct recall

Reference age	Participant's age	
	Young	Old
Past self-reference task		
M	0.18	0.17
SD	0.09	0.07
Present self-reference task		
M	0.20	0.22
SD	0.10	0.09

Experiment 2

Experiment 1 identified a significant difference during the free recall task performance between the past self-reference task condition and the present self-reference task condition. This difference suggests that memories of the two types of self have different forms.

Experiment 2 examined this supposition using a different experimental paradigm from the free recall task. The goal of using this paradigm was to confirm the general applicability of the explanation that memories of the past and present self take different forms. Experiment 2 used the task-facilitation paradigm (Klein, 1989), which compares the execution times of two successive tasks.

The task-facilitation paradigm is based on the theory that when two tasks are performed successively, performance of the second task should require less time than the first task if both tasks share a reference object. Indirect priming supports this theory: generally, if the same two tasks are performed twice, performance of the second task will be more rapid and fluent than the first task.

The task-facilitation paradigm was used to compare reference objects between past and present self-reference tasks. If reference objects differed between past and present self-reference tasks, the rating time during a condition involving successive performance of the same task in one trial (the same-task condition) was shorter than during a condition involving successive performance of two different tasks in one trial (the different-task condition). If reference objects were the same in both past and present self-reference tasks, no difference was evident between rating times during the same-task and different-task conditions, while rating times of the second tasks were shorter than rating times of first tasks in both the same-task and different-task conditions.

Methods

Participants. Participants included 20 undergraduate and graduate students.

Design. The experiment used a 2 (order of task: first task condition or second task condition) \times 2 (difference of task: same-task condition or different-task condition) \times 2 (reference age in self-reference task: past self-reference task condition or present self-reference task condition) within-subjects factorial design.

Materials. Words for the materials were selected using the same procedure as in Experiment 1; the 80 selected words were randomly divided into four word sets (20 words \times four word sets).

Apparatus. A NEC PC-9801 computer controlled word presentation and recorded rating times for the first and second tasks.

Procedure. In the task-facilitation paradigm, participants performed two kinds of self-reference tasks in one trial. The first task began when the trial number was displayed for 170 ms at the center of the computer monitor. After the trial number disappeared, the screen was blank for 1700 ms, after which a self-reference task began. The center of the computer monitor displayed three lines: a kind of self-reference task, a word for rating, and a sequence of numbers for rating the value. The first line presented a word that indicated a kind of

self-reference task; the second line presented a personality trait word; and the third line presented numbers 1–7 in order. One of these numbers had a square white background that could be moved using the computer mouse; if participants moved their mouse right or left, the white background moved right or left. Participants moved the white background to their selected rating value and clicked their mouse to input this value.

After the first task was completed, participants began the second task; the interval between the first and second tasks was 170 ms. After the second task was completed, the next trial began; the interval between the end of one trial and the beginning of the next was 170 ms. Trials were repeated 40 times. Instructions for the past and present self-reference tasks were the same as in Experiment 1.

Table 2 Procedure of Experiment 2

Step	Presentation time	Duration to change next step
(1) Presentation of trial number	170 ms	After 1700 ms, go to (2)
(2) Start of the first task		
(3) End of the first task		After 170 ms, go to (4)
(4) Start of the second task		
(5) End of the second task		After 170 ms, go to (1)

Results

A $2 \times 2 \times 2$ ANOVA was conducted for mean rating times; this ANOVA illustrated the three-way interaction during the self-reference task for order of task, difference of task, and reference age ($F(1, 19) = 4.53, p < .05$).

Subsequent tests of simple main effects revealed two significant differences. When participants performed the present self-reference task in the same-task condition, the first task had a longer mean rating time than the second task ($F(1, 38) = 7.09, p < .05$). In the same-task condition, the past self-reference task condition had a shorter mean rating time than the present self-reference task condition in the first task condition ($F(1, 38) = 5.55, p < .05$).

Table 3 Mean rating time (ms) of each condition in Experiment 2

	Same		Different	
	Past	Present	Past	Present
The first task				
M	2953	3267	3146	3092
SD	486	675	694	473
The second task				
M	2981	2940	3143	3061
SD	559	602	531	716

Discussion

In the same-task condition, the present self-reference task condition seemed to have a facilitating effect: rating times during the second task were shorter than during the first task. Other conditions did not seem to have a facilitating or inhibitory effect on rating times during the second task.

The present self-reference task was the same as the self-reference tasks used in previous studies. Therefore, while results indicating that this task had a facilitating effect during the same-task condition are not a new finding, they support previous studies.

This study did result in one new finding: the past self-reference task condition did not provide the same facilitative effect that appeared in previous studies when the same kind of task was repeated. One reason for the disappearance of the facilitative effect might be that reference objects differed between past self-reference tasks; the facilitative effect was not observed in the same-task condition.

In the task-facilitation paradigm, the facilitative effect was only observed during the present self-reference task condition and did not occur during the past self-reference task condition. These results indicate that memories differ between the present self and the past self.

General Discussion

This research used the self-reference effect to examine memories of the past self and the present self. A free recall task and a task-facilitation paradigm were used during examinations; the free recall task identified significant differences between the past self-reference and present self-reference task

conditions. In the task-facilitation paradigm, a facilitative effect was observed only when the present self-reference task was performed twice in succession. Neither facilitative nor inhibitive effects were recognized in the past self-reference task condition. These results indicate that the two selves differ from each other; i.e., the two self-reference tasks require different memory retrievals of self.

Klein (1989) proposed two self-reference tasks: a self-descriptive task and an autobiographical task. The self-descriptive task requires subjects to judge whether a word is self descriptive, while the autobiographical task requires subjects to access autobiographical memories. Klein suggested that the two types of self-reference tasks act independently during each process. Results of this research suggest the necessity for a new classification within the self-descriptive task based on the distinction between the past and present self. The self-descriptive task should be divided in two parts: a past self-descriptive task and a present self-descriptive task.

In both experiments, results of the present self-reference task condition were consistent with previous research. However, results of the past self-reference task condition differed from previous findings: the past self-reference task condition did not exhibit a facilitative effect. Several reasons might explain why the facilitative effect did not appear during the past self-reference task condition.

First, it is possible that there is no single past self. If the past self is composed of more than two parts, it may require accessing a different memory during the first and second tasks. If this is so, the first task cannot facilitate the second task, so a facilitative effect will not appear. The narrow scope of this study allows the possibility of such an explanation. Some theories support the idea that the past self is not a single entity; the Pollyanna hypothesis assumes that the mind retains memories of happiness or pleasant contentment over time. The past self might focus on a happy memory and separate this memory from other memories; this kind of separation might cause the facilitative effect to disappear during the past self-reference task condition.

The second reason that might explain why the facilitative effect did not appear during the past self-reference task condition involves how participants would have more than two memories of their selves as junior high school students. Memory of self would likely differ from the first to third years of junior high school. The facilitative effect may not have appeared because

participants retrieved a different object during the past self-reference task.

The third reason is that because participants had only vague memories of their past selves, retrieval of past self during the first task may not have facilitated retrieval of past self during the second task.

The purpose of this research was to examine whether memories of the past and present self would be the same or different. Results indicate that memories of the past self and the present self are held in different forms, and that the past self has unique features. Previous studies have examined the past self from an autobiographical perspective; future studies will need to examine descriptive features of the past self to enhance understanding of memories concerning the self.

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