Reading English Words Aloud: Will it help or will it not?

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Abstract

There have been several studies that would like to explore on the effectiveness of reading English words aloud in recall of information. Numerous researchers have hypothesized that reading English words aloud would help an individual accurately distinguish information from a set of unfamiliar words that were not read aloud. The researchers in this study replicated the study conducted by Ozubko and MacLeod's (2010) to see whether reading words aloud would help in accurately distinguishing the right words for each category. In two experiments, the researchers presented their participants with two lists of words, one critically mixed (CML) that had half of the words needed to be read aloud and a pure list (PL) that had either all words read silently or aloud. The researchers then found similar results to that of Ozubko and MacLeod's (2010) study where production effect can still occur regardless if the word is read silently or aloud.

Keywords: reading aloud, reading silently, production effect

Introduction

Mnemonics are strategies and techniques used to increase or aid memory. It may be verbal, visual, kinesthetic or auditory that relates or associates relevant information being processed to constructs that will allow retention and recall later on. The use of mnemonics is used when ESL learners need to recall important words they have read. Only relatively small encoding techniques or mnemonics related to memory are known and applied; Rehearsal, possibly being the most used and most popular increase memory retention by intuition (Ozubko &MacLeod, 2010). Imagery and semantic elaboration are also one of the few mnemonics related to memory.

A phenomenon has been set on reading words aloud for the past 40 years (Conway & Gathercole, 1987; Dodson & Schacter, 2001; Gathercole & Conway, 1988; MacDonald & MacLeod, 1998). Later on, the phenomenon or mnemonic strategy of reading aloud was called production effect wherein words are shown openly or explicitly given (Ozubko &MacLeod, 2010). Another phenomenon is introduced and is compared to production effect; it is known as the generation effect. The generation effect refers to the readers themselves being part of the production process of words that they will have to read as oppose to having an external source give the words to them; this way, the words read are better recalled and remembered by the reader (deWinstanley & Bjork, 2004).

Generation Effect

In 1978 Slamecka and Graf reported a thorough set of experiments demonstrating that producing a word from a cue leads to considerably better memory for that word than does simply reading the word. This is also the phenomenon whereby items that are self-generated by individuals are better remembered than are items that are provided to them (McElroy & Slamecka, 1982; Slamecka & Fevreiski, 1983; Slamecka & Graf, 1978). This phenomenon is called the "generation effect". It has become one of the most widely used manipulations in memory research, leading to their article becoming a citation classic (Slamecka, 1992).

Despite numerous investigations establishing the presence of the generation effect, the specific mechanisms by which this effect works remain unclear. In an attempt to elucidate the basis of the generation effect, researchers have studied the limits under which the generation effect would or would not occur. Some researchers argued that meaningful semantic processing must be present, otherwise there would be incomplete generation, and recall would not be effective (Slamecka & Fevreiski, 1983). McElroy and Slamecka (1982) also emphasizes the importance of semantic processing, a failure of the generation effect occurs when the generation of the semantic attributes of a word are not associated with self-access to the correct lexical item. Support for this theory was evidenced when the generation effect was not present when nonwords were used (Gardiner & Hampton, 1985; Gardiner & Rowley, 1984; McElroy & Slamecka, 1982) or was not present with words of very low frequency (Nairne, Pusen, & Widner, 1985). Although semantic processing appears necessary for the generation effect to occur, the level of semantic involvement required is unclear, given evidence that the generation effect has also been shown with numbers and calculations (Gardiner & Rowley, 1984). Other researchers have argued that the generation effect occurs only because the generated items are distinguished from other items (Begg & Snyder, 1989). Others call the generation effect too general and may be applied not only to reading but also to mathematical problems, trivia questions, and reading comprehension (deWinstanley & Bjork, 2004). However, the memorial advantage of generation may or may not appear at certain times. For example, McNamara and Healy (1995a, 1995b, 2000) generation effect does not aid to memory recall in arithmetic problems unless retrieval techniques are used. Accounts of generation effect also show that, it is assumed that the only time generation effect occurs is if, the nature of the task leads the participants or readers to focus on their processing of information which later on leads to sensitive and effective retention of information. When there is not a good relation between the types of information and processing, there shouldn't be a generation effect; thus saying that generation effect falls on the relation between the encoding process and retrieval process (deWinstanley & Bjork, 2004). Although there has been much research in the attempt to understand the limits under which the generation effect would and would not occur, the precise underlying mechanism by which this effect occurs is still unknown.

Production Effect

The production effect is thoroughly delineated by MacLeod et al. (2008) in a series of experiments. The production effect according to Hourihan and MacLeod (2010) refers to the fact that, relative to reading a word silently, reading a word aloud during study improves explicit memory. Production effect benefits memory even for non words,

indicating that an item need not have a preexisting lexical entry to benefit from production. Intriguingly, words do not even have to be read aloud to show a production benefit: Mouthing words without vocalizing results in the same benefit in explicit memory. Like the generation effect, the production effect seems to arise from the distinctiveness of the produced words relative to the read words (MacLeod, et al., 2008). Produced or generated words stand out at the time of test, either because they are stronger—a one-process account—or because the extra information about having been generated or produced is useful in recollection—a two-process account (Dobbins, Kroll, Yonelinas, & Liu, 1998).

Frequency Theory

Hopkins and Edwards (1972) tested the key assumption of the frequency theory which states that recognition will take place if words are pronounced than unpronounced because pronouncing the word would increase it's familiarity and item's frequency. To prove this, Hopkins and Edwards conducted a study wherein there are two recognitions tests; Experiment 1 is two-alternative forced choice and Experiment 2, yes/ no. In these 2 experiments, 3 groups had participants that studied a list of 100-words, one pronounced, one read silently and one mixed list of words; 50 read aloud and 50 read silently. The experiment found no between- subjects benefit in reading words aloud. But in the mixed list where 50 words were read aloud and 50 read silently, words that were read aloud were recognized easily than those read silently (MacLeod et. al., 2010). This stayed consistent with the other recognition test wherein within subject-benefit reading aloud rose at about 10%.

Distinctiveness

Hopkins and Edwards (1972) argued with Conway and Gathercole (1987) that the advantage of reading words aloud occurs in the encoding itself, leading to the suggestion of enhanced distinctiveness. Being distinct means that a word must be unique with respect to other words in order to be recalled or remembered and must be item-based. Murdock's (1960) theory states that "the concept of distinctiveness refers to the relationship between a given stimulus and one or more comparison stimuli, and if there are no comparisons stimuli the concept of distinctiveness is simply not applicable." In other words, if distinctiveness is crucial, and without unique responses to the items, there would be no production effect (MacLeod, et. al., 2010).
In results, a word read aloud allows time elapsed for distinctiveness and processing record to occur. Therefore at the time of retrieval, the word is recognized and recalled.

The present study investigates if there is a difference in the amount of information being recalled with regards to the way it is being read. More specifically, it was tested if there a significant difference in the amount of information being recalled when it is read aloud than read silently. Participants were exposed to a "Critical Mixed List" (half read aloud, half read silent) and others to "Pure List" (either all aloud or all silent). The outcome measured were the accuracy of the discrimination of words. This study hypothesizes that there is a difference in the amount of information being recalled with regards to the way it is being read. It is also hypothesized that there is a significant difference in the amount of information being recalled when it is read aloud than read

silently. This study is a replication of Ozubko and MacLeod (2010) where the researchers would like to find whether or not the results would differ in an Asian setting.

Method

Research Design

The experimental design used in the present study was a between groups design. This design avoids the carryover effects that can plague a within subjects designs. The participants in this design are exposed to two different types of treatment: Reading aloud and reading silent. Two samples were analyzed for each experiment. In each sample, a critical mixed list is presented followed by a pure list (purely reading silent or aloud).

Participants

The group conducted the study at a private university in Manila, Philippines. There were two samples in the study with a total of 60 participants. Each sample is composed of 30 participants with 15 participants for each condition. The ages of the students ranged from 18-21 years old. The participants were college freshmen who were enrolled in the college of education.

Materials

The word pool used in this study are the same taken from MacDonald and MacLeod's (1998) study. The words were then randomized using to form lists of 32 words to be used in the experiments. The researchers also used a PowerPoint presentation to flash each word for 2 sec. with a 0.5-s interstimulus interval.

The researchers also made use of a 64-item test that was completed after the PowerPoint presentation was shown. The 64-item test consisted of the 64 words presented in the PowerPoint presentation. The test was designed where participants checked the words that were presented to them.

Procedure

The researchers were able to gather two samples each had 15 respondents each. The first sample went through two experiments with Critical Mixed List (CML) and Pure List (PL). In the CML, half of the words are needed to be read aloud and in a PL where all words were read silently or aloud. In the first experiment, the CML was flashed first, and then followed by the PL which was read *aloud*. On the other hand, the second experiment for the first sample was presented with the PL first which was read *silently*, and this was followed by the CML.

The second sample also went through two experiments. The first experiment presented the participants with the CML followed by the PL which was read *silently*. On the other hand, the second experiment presented the PL which was read *aloud*, followed by the CML.

After the presentation of the lists for each experiment for the two samples, the researchers provided a test after the activity was conducted. The participants were given a sheet of paper where they checked the words that were presented to them. The test was used to measure if the participants were able to identify which list each word came from (CML or PL).

At the end of the experiment, the participants were debriefed about the purpose of the study.

The one-way Analysis of Variance (one-way ANOVA) was used to test if there was a significant difference between the reading aloud and reading silent for the total sample. The t-test for two independent samples was used for each experiment to test mean differences whether words read aloud are recalled better compared to words read silently. Effect size for the on-e way ANOVA was computed using the Eta Coefficient while effect size for the t-test for mean differences were obtained using Cohen's *d*.

Results

In the first analysis, all participants were combined for both experiments to test whether participants can recognize which set of method does each word belongs (CML or PL). The One- Way Analysis of Variance was used to test whether the reading aloud or silently differed. In the second analysis, the means between reading aloud and reading silently was differentiated (using t-test for 2 independent samples) on word recognition for the first experiment. In the last analysis, the means between reading aloud and reading silently was again differentiated on word recognition for the second experiment.

Table 1
One-Way ANOVA Summary Table

Source of Variation	*SS*	*df*	*MS*	*F*
Between Groups	10.61	1	10.61	598.65*
Within Groups	.33	3	.11	
Total	.99	56	.02	

The analysis using the one-way ANOVA showed that there is a significant difference between reading a text silently and reading it aloud. Significant effects of reading aloud was on recognition of words (F=598.65, p= .00). The words that were read aloud significantly had the highest mean score (M=.3, SD=.15) as compared with words read silently (M=.20, SD=.16). Large effect size was also obtained for word recognition (η=.97).

Table 2
Mean Comparison of Reading and Aloud and Silent for Experiment 1

	Experiment 1 (sample 1)			Experiment 1 (sample 2)		
	M	*SD*	*P*	*M*	*SD*	*p*
Reading Aloud	.51	.13	.04	.27	.12	.03
Reading Silent	.23	.18		.35	.07	

When the analysis between reading aloud and reading silent were compared for each sample for experiment 1, the means also showed significant difference using t-test for two independent samples. The effect size for this analysis was large (*d*=.1.8). For the second sample, when the same comparison of means was conducted, significant difference were also obtained which also yielded a large effect size (*d*=.81).

Table 3
Mean Comparison of Reading and Aloud and Silent for Experiment 2

	Experiment 2 (sample 1)			Experiment 2 (sample 2)		
	M	*SD*	*p*	*M*	*SD*	*p*
Reading Aloud	.45	.22	.37	.44	.12	.21
Reading Silent	.38	.19		.37	.18	

The same mean comparison was conducted for the second experiment. The words that were read aloud and read silently were compared using t-test for two independent samples. Unlike in the first experiment, the significance tests done for the second experiment did not yield significant results. There were no mean differences found between the words read aloud and read silently on the word recognition for both the two samples. Although large and medium effect sizes were still obtained on word recognition with Cohen's d value of .63 and .45 respectively for samples 1 and 2.

Discussion

The present study hypothesized that there is a significant difference when recognizing English words that are read aloud and words read silently. The overall analyses using the one-way ANOVA and the first experiment support the results in previous studies (Ozubko & MacLeod, 2010). Reading a text aloud is again evidenced to be more effective on word recognition than reading words silently which further support studies done about generation effect. The information gets is processed effectively in memory by reading aloud. This leads to an interpretation that even when small samples are obtained, production effect is proven and can occur in situations where words are read aloud.

However, the findings of the study did not hold consistent results when the experiment was repeated in another similar sample. The findings where the mean scores are higher for read aloud English words did not turn to be the same for the second experiment. Although it can be argued that the means are still higher for the reading aloud group. Although significance was not achieved in the second experiment, the effect sizes remained to be large to moderate. In the first experiment, the reading aloud condition was presented first followed by reading silently. In the second experiment, the opposite order was presented to control for possible sequencing effect. These findings reveal that reading aloud works better and produces higher English word recognition when presented first to participants. This indicates that participants effectively recognize words when reading aloud is presented as a form of primacy effect. Primacy effect occurs when stimulus such as words are presented as the first cue in experiments. The stimuli that are presented first results to having more superior recall of information in memory.

The present study highlights not only the effectiveness of reading aloud as explained by the generation effect but how effective reading aloud can be when primed as the initial mnemonic device presented. This result supports the explanation of Dobbins, Kroll, Yonelinas, and Liu (1998) about the generation of information with an extra process. This extra process comes in the form of the order as to when reading aloud is used. This notion extends theory on generation and production effect. The existing knowledge established for the generation effect is that items that are self-generated by individuals are remembered. But the present study elaborated that remembering is better when the item generation is presented as the primary stimuli.

The theoretical extension for the generation effect has further implication in classrooms where reading aloud is used. Perhaps when teachers use reading aloud activities as part of an initial set of strategies in teaching, the effects in terms of recall would be better. To make the strategy useful and effective for students, the teachers have the primary role of training students how to do reading aloud effectively. Reading aloud as a self-generating strategy for thinking should be taught as part of an initial orientation especially in English classes where this strategy often used. It needs to be emphasized to students that reading aloud is not merely passive reading but they are free to evoke their insights about particular reactions and metacognitive thinking on the contents of what they are reading. When the use of the strategy is set, English reading teachers can further establish the appropriate timing as to when reading aloud can be implemented guided with the findings of the study.

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