Intentional learning and incidental learning

Words: 2027

Introduction

This study focuses on the cognitive approach to psychology that studies the mental process of people. Memory is a major area of research in this perspective. In the study of learning, intentional learning is seen as more effective than incidental learning. Intentional learning is characterized by rehearsal whereas incidental learning is defined as "unplanned learning" which occurs simply due to exposure to stimuli.

Psychologists have long known about the role of rehearsal in memory formation. As early as 1949, Hebb found that rehearsal led to stronger neural connections which could explain the formation of memory. However, we all know that we learn things without having a lot of practice. And this is where incidental learning takes place.

Hyde & Jenkins (1973) conducted an experiment on incidental learning. Participants were allocated to one of two groups. Each participant was read a list of words and then asked to do one of five tasks: Rate the word for pleasantness; Estimate the frequency with which the word is used in the English language; Detect the occurrence of the letters 'e' and 'g' in the words; Decide the part of speech appropriate to each word; Decide whether the words fit into a particular sentence. The participants in the first group performed the tasks not knowing they were going to have to recall the words in the end. Whereas the second group performed the tasks knowing that they would have to recall the words. There was also a control group that was instructed to learn the words without carrying out the tasks. All three groups were then given a test of recall. Results were that the pleasantness rating and rating frequency of usage tasks produced the best recall as it involves semantic processing whereas the other tasks did not as incidental learners performed just as well as intentional learners in both tasks.

In this case it appears that knowing that you would have to recall the list, which we would expect would lead to rehearsal and better recall, was not the case unless semantic processing was involved. This may mean that simply knowing that you need to remember something is not enough and it is actually the way that one processes the information that makes a difference. In other words, it's not the effort, it's the processing. In this case, intentional and incidental learning may not be as different as one would think.

The aim of this study is to see whether there is a significant difference between intentional and incidental learning of a list of words among bilingual international high school students at a school in XXXX. The independent variable will be intention – that is, whether the participants are told that they will have to recall the words in the end. The dependent variable will be how many words that they recall out of the list of 15 words. We think that this is important because it may show that a lot of learning happens without a lot of rehearsal. This may show that it is more about how we interact with information in the classroom that leads to retention of information, rather than how much time is spent studying. It could lead to changes in how teachers run their classes.

H_0 = There is no significant difference in recall between participants who are intentional learners and participants who are incidental learners.

H_1 = Participants who are intentional learners will recall significantly more words from a list of 15 words than participants who are incidental learners.

Exploration

This experiment used an independent samples design. This design was used because it is important that the list of words is standardized in order to make sure that it was not the difference in the words that caused the difference in the number of words memorized. It is realized that there may be participant variability in the two groups, so it was important that when creating the list of words that the words be familiar to students. In order to make sure this was true, a pilot test was done with students one year younger than the participants in our sample. It was found that all students in the sample could recognize, recall and spell all of the words on the list.

In addition, it was important that the students could understand the questions that were asked. We gave the list of questions to the year 7 students to see if they could do the task. We wanted to use the original list of questions, but found that the tasks were too difficult. We decided to use only three tasks and instead of writing them as sentences, we wrote them as questions: Do you think that this is a positive word or a negative word?; How many e's and g's are there in this word?; Is this word a noun or a verb? When we changed the questions, we found that the year 7 students had no problem with the questionnaire.

There were 18 participants who were all in year 8 in an international school in XXXX. In order to simplify things, we used one English class with 18 students and then randomly allocated them to one of two conditions by pulling their names out of a hat. In the intentional condition, there were 5 boys and 4 girls. All of the participants were second language speakers, but they were no longer in ESL. In the second group there were 7 boys and 2 girls. 3 were native speakers and the rest were non-native speakers. 1 of the students was still in ESL classes.

Our procedure was as follows.

1. After the participants were randomly allocated to groups, one group was moved to another classroom. Both conditions were tested at the same time to make sure that there was no contamination where members of one group could tell the members of the other group what was about to happen.
2. Participants signed informed consent forms (see app i).
3. The researcher then passed out the questionnaires (see app ii)
4. The researcher then read the directions (see app iii) that explained that a list of words would be read. For each word, there was a question on the questionnaire that they received. So, for word 1, they should answer question 1. In condition 1, they were told that they would have to remember the words at the end; in condition 2 they were not. Participants were asked if they had any questions about the directions.
5. The list of words were read out. Each word was read as "Number 1. Hamster." Then there was a 30 second pause so that the participants had time to answer the question. This was done for all 15 words.
6. When the list was completed, a blank sheet of paper was given to the participants.
7. The participants were then asked to recall as many words from the list as they could. They were given 2 minutes.
8. When the two minutes was completed, the experimenter said 'stop' and the sheets were collected. The participants were debriefed (see app iv).

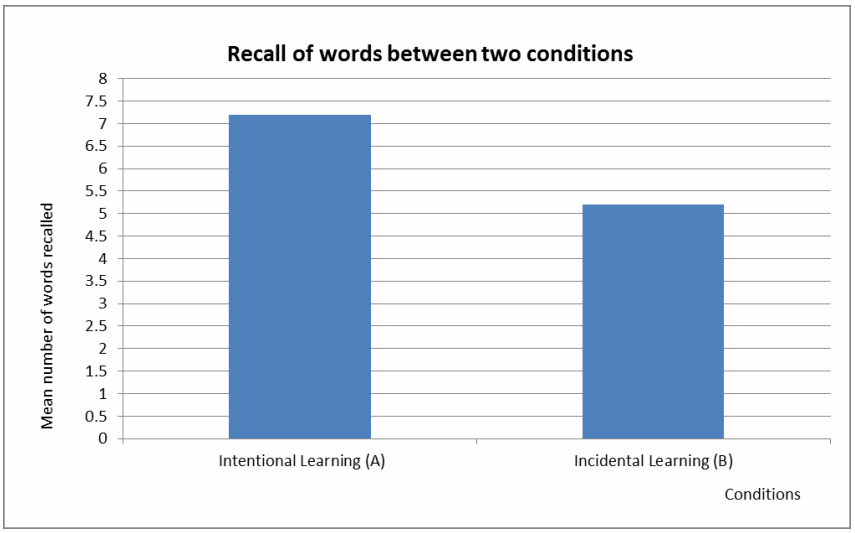
Analysis

In order to compare the results of the two groups, I calculated the mean and the standard deviation.

	Intentional learning	Incidental learning
Mean	7.15	5.12
Standard Deviation	1.8	4.00
Median	6	3
Range	5 - 12	2 - 13
Mode	6	2 & 5

The results show that the intentional learners recalled a higher number of words than the incidental learners. In addition, it can be seen by looking at the standard deviation that there appears to be a lot more variance in the scores in the incidental learning. In the intentional learning group, the median was six – that means, just as many participants scored above 6 as below six. The range of scores was between 5 and 12, with the most frequently received score being 6. In the incidental learning group, the data was much less clear. The range of scores was between 2 and 13. The median score was 3, meaning just a many participants scored 3 or above as scored 3 or below. There was also a bimodal distribution in the results with the most frequently received scores being 2 and 5, with three participants for each. Two participants scored 13 and the rest scored 5 or below. It appears that participant variability played a role in the results.

The following graph compares the means of the two groups.



A Mann-Whitney U test was used to determine whether there was a significant difference

between the two conditions. The test was a one-tailed test as we were predicting that the intentional learners would recall more words. The U value of 21 exceeded the critical value of 16 for $p < 0.05$ so we can reject the null hypothesis. It appears that the results of this study are not simply due to chance. We can conclude that when there was an intention to learn the list of words, participants were able to recall more words than when they did not have this intention.

Evaluation

It can be seen from our results that we were able to draw the same conclusions as Hyde & Jenkins in their original research. However, our results may be a bit simpler than the original ones since we did not analyse whether the difference in the questions made a difference in which words were memorized, we only focused on the overall ability to recall words. When looking at our data, it appears that in the non-intention the semantic words were recalled more often, but we also asked the semantic question for the first 5 words. It could also be that the reason they were recalled was the primacy effect, so we do not think that this is an important part of our findings. We also changed the style of the questionnaire from asking participants to rank information to answering a question with only two possible answers. This may have also affected the scores as it is difficult to know the amount of effort that the participants put into really answering the questions.

It was a strength of our procedure that we carried out a pilot test to make sure that the words and the questions were ok with this grade level. We did not have any blanks on the questionnaires and participants did not have many questions about the instructions.

In the results you can see that participant variability may have affected the results. This is one of the limitations of an independent sample design. By replicating the study we may find that this effect disappears with other groups. It could also indicate that there is far more to the learning than an experiment such as this one can uncover. By separating students into two categories and assuming that the differences in the conditions actually is a clear difference, a large amount of interaction is missed. The cognitive processes which make up memory are far more complex than a simple experiment can reveal. Some of the areas which could be influential are outlined below.

One of the limitations of our study was that we had different researchers reading the list in each room. This could have made a difference as students in our school have different pronunciations. In a future replication, we would record the list to make sure that we could guarantee that each group heard exactly the same pronunciation and that the time between words was accurate.

Another limitation of our sample is that the majority of our participants were bilingual. This may have actually affected the results. The incidental group had more native speakers, yet scored worse. Since the data is anonymous, we do not know which participants received the highest scores. However, overall the bilingual group did better. Does this mean that they process words more because they are bilingual? We would want to make sure in a future study that both groups were either bilingual or not, in order to examine this variable.

Our study also only looked at very common nouns and verbs. It is a question whether more abstract words would be more difficult to remember. One of the things that we cannot control is whether the word produces an image in the minds of the participants. This may affect their ability to recall the list of words. In we were to carry out further research, we would want to see if the types of words would affect the ability to recall.

Finally, although it appears that intention does have an effect on our ability to learn, the relationship is not that straightforward or linear with one set of circumstances leading to another. There are so many variables that may have affected whether or not learning takes place, it is almost impossible to control them all or draw a clear conclusion. Further replications which try to

control those variables may give us a better understanding, but attempting to understand the contribution of each of the variables to learning under different circumstances, might lead to a rounder, more holistic understanding of the process as a whole.

Works cited

Crane, John, and Jette Hannibal. *IB Diploma Programme: Psychology coarse Companion.* Oxford University Press, p 87.

Hyde & Jenkins (1973). Journal of Verbal Learning and Verbal Behaviour, 12, 471 – 180.

Levels of Processing Theory. <http://cranepsych.edublogs.org/files/2009/06/Levels_of_Processing.pdf>Web. 6 Nov. 2011.

Appendix I. Internal Assessment Proposal

Study to be replicated: Hyde & Jenkins (1973)

Materials required: A standardized list of 15 words. A questionnaire which asks one question for each word asked. Pencils for the participants. A stop watch.

Procedure: Both groups will be given a questionnaire. They will be asked for each word, to answer the corresponding question. So, for word 1, they need to answer question 1. One group will be told that at the end of the list of 15 words, they are going to be asked to remember as many words as possible. The second group will not be told this.

Ethical considerations: Participants will be under 18 years old, so parental consent will be received from the members of the class before we carry out the experiment. The participants will also have to sign the form. They will not write their names on the questionnaires in order to make sure that their data stays confidential. We do not believe that there is any chance of undue stress or harm for the students as this does not count in their grade. We will also debrief the students both right after the experiment to let them know what we were looking for, and then when we have our results to let them know what we found. They may withdraw their results if they want to.

Feedback on the proposal: I need to do a pilot test of the word list and my questionnaire to make sure that they are understandable. I need to figure out how I am going to randomly allocate them to conditions. Even though one of the questions is semantic and the rest are not, I am not going to focus on this. I am going to only report on whether intentional learning made a difference.

_____

Teacher signature