

Undergraduate Psychology Research Methods Journal

Volume 1 | Issue 11

Article 4

5-2010

See It! Hear It! Learn It!!

Mansi Brat
Lindenwood University

Follow this and additional works at: https://digitalcommons.lindenwood.edu/psych_journals



Part of the [Psychology Commons](#)

Recommended Citation

Brat, Mansi (2010) "See It! Hear It! Learn It!," *Undergraduate Psychology Research Methods Journal*: Vol. 1 : Iss. 11 , Article 4.

Available at: https://digitalcommons.lindenwood.edu/psych_journals/vol1/iss11/4

This Article is brought to you for free and open access by the Psychology, Sociology, and Public Health Department at Digital Commons@Lindenwood University. It has been accepted for inclusion in Undergraduate Psychology Research Methods Journal by an authorized editor of Digital Commons@Lindenwood University. For more information, please contact phuffman@lindenwood.edu.

See It! Hear It! Learn It!!Mansi Brat³

The purpose of the following study was to determine if quick and accurate learning can be accomplished by combining visual and auditory modalities amongst a group of participants. By using different modalities, the researcher aimed to demonstrate that helpful and effective learning study strategies can be generated. Thus such techniques involved the use of more than one sensory channel to impart learning. It was noted that the strategies could be very effective when a student had to learn words or paragraphs containing difficult words. Finally, the researcher wanted to determine whether the participants who were exposed to more than one learning modality performed better than those who were just exposed to one? Significant differences between the three groups of participants were found at the completion of the study. It was noted that the participants in the visual group depicted a mean of 14.2667 and a standard deviation of 4.51136; those in the auditory group depicted a mean of 14.0667 and a standard deviation of 3.12745; lastly those in the visual and auditory group depicted a mean of 16.0667 and a standard deviation of 2.43389. The implications of the study thus, revealed a significance level $>.05$.

The research for the current study dealt with how different learning modalities can be combined to foster better learning in individuals. Literature review from the past formed a discrete conception of the idea stated above. The researcher's hypothesis was to examine whether by combining visual and auditory modalities, an individual could perform better on

³Mansi Brat, Psychology Department, Lindenwood University.
Correspondence concerning this project should be directed to Mansi Brat, Lindenwood University, 209 S. Kingshighway, Saint Charles, MO, 63301, mb053@lionmail.lindenwood.edu, (636)-426-0719.

learning tasks than those who were exposed to only one modality, (i.e. either visual or auditory). Research findings from other sources indicated similar viewpoints. Felton (2008) talked about visual literacy- in other words, how pictorial representation has become part of an individual's communication and meaning-forming skills. When examining the article in detail, it was noted that creating images of various aspects and communicating through them has become a popular culture-phenomena, and the society is in itself producing a number of visual literate learners who are visual communicators too. Felton (2008) mentioned that visual learning not only enhances one's ability to comprehend various concepts but also encourages a student to produce and use substantial actions for improved learning. In addition, through continuous training and follow up, a student cannot only utilize the different interpretations of visual learning but can also master its language structure.

As a matter of fact, Felton (2008) stated that visual learning has been a concept of the past and was in use earlier, however, the practice of visual literacy for communication, was developed as a new formed skill over the past decade as a product of new communication technologies. In addition, Felton (2008) in his article developed the idea that seeing does not only involve submissive reception of a certain stimulus but also includes active creation of meaning of the particular stimuli. He also stated that just as writing is an essential tool to develop textual literacy, trying to create a meaning out of images or to have a critical viewpoint when assessing images is also an important component when learning visual literacy. Felton (2008) argued that although schools have fostered the learning skills in students through textual literacy, visual literacy is being adopted as a discipline in various higher education institutions. For example, as cited in Felton's (2008) article, the Spatial Perspectives on Analysis of Curriculum program is a good way to explain the concept of visual literacy. It helps teachers of academic

institutions teach spatial thinking in the areas of social and environmental sciences by using tools such as a 'virtual globe'. Even in other areas such psychology and education, visual images are used by college teachers to promote a student's capabilities and expertise (Felton, 2008).

In a similar article, De la Iglesia, Buceta and Campos (2005) examined how using mental images as a learning modality can foster faster learning amongst people suffering from disabilities such as Down's syndrome and other intellectual disabilities. De la Iglesia, et al. (2005) mentioned that there have been several studies that have not only used images or drawings as an approach for better learning, which they describe as prose learning but the learning has even increased the reception and retention of people without disabilities. However, for people who require special educational needs, adopting such techniques has been a recent process (De la Iglesia, et al, 2005). In addition, the article suggested that people suffering from disorders such as the Down's syndrome have immense difficulty when retaining verbal information as compared to visual information, but for people with intellectual difficulties it is the other way around. For this reason, a study was conducted on similar terms using 22 children, of which 15 were boys and 7 girls, each suffering from Down's syndrome.

In De la Iglesia, et al.'s (2005) first experiment, the children were divided into three groups and all three groups were given a different task to complete. In the Auditory condition, the participants could only listen to the story that was being recited to answer related questions at the end of it. In the Drawing condition, the participants were shown pictures of the story in an appropriate sequence as they heard the story being recited, again to answer some questions at the end of it. In the Mental Image condition, the participants were given training to form mental images of a different story before the actual story was presented (De la Iglesia, et al, 2005). In the training session, the participants were taught how to form mental images of a story in the

correct sequence when one actually listens to a particular story. To ensure the validity of the training the participants were asked if they could form images of the story or not. Once they were able to do so, the researchers made sure that the process could be repeated in order to ensure re-learning.

On the other hand, the results showed significant differences. When recalling words the results varied tremendously between the auditory condition and drawing, and drawing and mental imagery. The level of recalling words was very high for the drawing condition than the other two (De la Iglesia, et al, ect 2005). Also, the level of recalling words was higher for the mental imagery group than the auditory group. In addition, when recalling ideas, the results varied for mental imagery strategy and the auditory condition and between auditory condition and drawing to a significant extent. When recalling ideas immediately, the level of recall was again very high for the drawings group than the auditory and mental imagery (De la Iglesia, et al. 2005).

In another article, Newcomer and Goodman (1975) basically stated that most children in school fail to follow the instructions given to them due to numerous modality deficits that come in their way while the information is being processed in the brain. Thus, to examine what learning modality best suits a child, the researchers conducted a study which revealed that when a child was exposed to a particular learning modality on the basis of his preference, i.e. those who preferred visual were presented with visual learning tasks and those who preferred auditory were given a auditory task, did not perform significantly better, while instructions were given to them or even while processing information (Newcomer & Goodman, 1975). However, it was noted that the use of visual modality increased the results of information processing amongst the individuals despite of the preferences made by the individual. Newcomer and Goodman (1975)

thus, concluded that superior performance could be observed when children of any group i.e. either high auditory, low auditory, high visual or low visual were given instructions through visual modalities, with the exception of those who were in the high visual group since the children of this group were able to process information displaying equal results when using either visual or auditory modality.

In Most and Greenbank's (2000) study, the literature stated that the ability of a participant to recognize emotional meanings depended on the sensory channel that he/she is exposed to. The researchers determined the discernment of emotions on the basis of auditory, visual and auditory-visual sensory modes. Participants of this study were from two groups; one that was suffering from learning disabilities and the other that was not. Its results demonstrated that the participants with learning disabilities and those without the disability achieved high scores when recognizing emotional cues through the auditory-visual sensory channel, as compared to the rest of the participants (Most & Greenbank, 2000).

However, in a contradicting study, however Budoff and Quinlan (1964) depicted a completely different approach about learning modalities. The researchers examined the effects of auditory (referred to as aural) and visual learning in primary grade children. For the purpose of the study, Budoff and Quinlan (1964) recruited 56 second-grade children, assuring that none were suffering from a deficiency that could cause hindrances in auditory or visual perception. Thereafter, the participants were first exposed to a visual task which included a list of paired words, and then to the auditory (aural) task in which a list of words was prerecorded on a magnetic tape. The stimulus of both tasks was presented in a way that the time taken for each trial was 80 seconds. In addition, there was a one hour interval between the exposures of the two tasks for maximum output from the participants (Budoff & Quinlan, 1964). The results

significantly noted that auditory learning was more effective amongst such children, in terms of accuracy and effectiveness; also the use of the particular approach consistently decreased as the child grew older.

In terms of the current study, its rationale was to examine if quick and accurate learning could be accomplished by combining visual and auditory modalities. The main idea behind developing this study was to determine how learning can be enhanced by using different modalities, and also to what extent would it affect the retention or the recall ability of a participant. Thus, for the purpose of the study, the researcher created three kinds of learning tasks, namely a visual task, an auditory task and a visual and auditory task. In addition, the participants involved in the study were divided into three groups; each group was then given the assigned task to complete. It was hypothesized that the group of participants who were exposed to both auditory and visual learning techniques would be able to learn words more accurately and in a proper sequence, than the participants of other groups who were exposed to only one modality that is either visual or auditory.

Method

Participants

For the purpose of this study 45 undergraduate students were recruited from Lindenwood University's Participant Pool (LPP). A total of 13 men and 32 women were part of the study. The participants took part in the study to earn bonus points in introductory general education courses at Lindenwood University. The participants were thus, tested on the basis of using learning modalities, which were either visual, auditory or both, taking into consideration that no participant suffered from any conditions that could cause hindrances for him/her from performing in the study.

Materials

To ensure the basis of the study, the researcher used various materials to test the participants. The materials included a PowerPoint presentation of words (See Appendix A), each on a slide, which was shown to the participants on a laptop screen. The laptop was a CW series, model Sony Vaio. The researcher also used audio recordings of words, those listed on the PowerPoint slides, for an auditory presentation. The sounds were pre-recorded on an audio-recorder and played to the participants. The word selection was done on a random basis, however the auditory stimuli was recorded on the Microsoft Windows sound recorder software through Google translator.

Procedure

At first, each participant was asked to sign up for the experiment at the LPP office's sign up board, where he/she selected the timings of the experiment suitable to him/her. At this point, a participant knew what time to take the study and where the study would take place. Thereafter, when the participants arrived at the room where the study was scheduled to be conducted, they were given a packet which consisted of the following paperwork to complete- two informed consent forms (See Appendix B), a feedback letter (See Appendix C), and a demographic questionnaire (See Appendix D) and a document with the researcher's list of participants. Each of which he/she was asked to fill out. On completion of the forms, the participant was asked to keep the feedback letter and a copy of the informed consent form, while the researcher kept the demographic questionnaire as well as a copy of the informed consent form. The participant, at this time, i.e., prior to the beginning of the study was debriefed by the researcher, stating that he/she was permitted to leave the study anytime they felt uncomfortable about taking the task.

Once the participant had all the required information needed before the study could begin the researcher randomly assigned each participant to one of the either groups namely, the visual group; the auditory group or the visual and auditory group. Based on the assigned group, the participant was asked to take a particular learning task which the researcher assigned. For this study, the researcher designed three kinds of learning tasks for each group, accordingly. The learning trials included a visual learning task, an auditory learning task and a visual and auditory learning task.

The visual task was given to the participants of the visual group only. It consisted of a list of words which was shown on a Power Point slide show, with an interval of 10 seconds between each slide. The participants were asked to memorize the words as the slide show progressed, in the particular sequence he/she could see the words. The auditory task was given to participants of the auditory group only. It included the same list of words (which were used in the first task) pre-recorded on an audio-recorder and as recording was played the participants could hear the words, which they were again asked to memorize, in the sequence he/she could hear the words. In this task, the recording of each word was 10 seconds apart. The visual and auditory task which included a combination of the visual task and the auditory task was given to the participants of the visual and auditory group only. To maintain consistency, this task was combined in a way that the slide show of the words and the recordings of the same words played simultaneously i.e. each word appeared on the screen appeared at the same time its recording played. In this group too, the participants were asked to memorize the words in the sequence he/she saw and heard the words.

In addition, the participants of each group were exposed to the list of words twice, i.e. the PowerPoint slide show for the Visual group was shown twice. The recordings for the auditory

group were also played twice. The auditory and visual group was also presented with the same list of words; again twice i.e. the participants of this group could see the list words on the Power Point slide show and along with it could hear the audio recordings of the words simultaneously. In each of the three cases, after the participants were exposed to the same list of words twice, they were asked to write the words in the sequence they viewed or heard them, on the data collection sheet (See Appendix E) provided by the researcher. Thereafter, once the researcher had collected the data from each participant, the data was scored. For each correct response i.e. correct spelling and correct placing of the word, a participant received 2 points; for a partially correct spelling and correct placing of the word, a participant received 1 point. However, for a correctly/incorrectly spelled word but a wrong placing, a participant didn't receive any points. The scoring of the data was determined by the researcher, keeping in mind the ideology to enlist the accurate sequence of the words. Thus, the maximum score on each learning task for a particular group was a total of 20 points, while the minimum scores obtained from the results, were 6 points, 8 points and 12 points for the visual group, auditory group and visual and auditory group, respectively.

After completion of the study, the participant was handed his/her participant receipt which was a proof that he/she was part of the study and was thereafter eligible to earn bonus points for the particular study through the LPP. In addition, the participants were also handed a candy by the researcher as a token of appreciation for being part of the study.

Results

The results of the study demonstrated significant differences between the three groups of participants, in accordance of the demographic information retrieved from them. However, when demonstrating what the researcher hypothesized, i.e. learning a list of 10 words through a

combination of both visual and auditory modalities would generate higher outcomes on a task than learning the same list using only one modality (either visual or auditory), a one-way analysis of variance, using the SPSS software was conducted to compare the overall performance of the individuals on the recall test by study method. The results revealed no statistically significant effect of study method, $F(2,42) = 1.514, p > .05$.

In addition, the means and the Standard deviations of the three groups were as follows; visual group depicted a mean of 14.2667 and a standard deviation of 4.51136; the auditory group depicted a mean of 14.0667 and a standard deviation of 3.12745; the visual and auditory group depicted a mean of 16.0667 and a standard deviation of 2.43389.

Discussion

Although the results of the study didn't report significance in terms of the study method, when examining the means of each group based on participant performances, there were slight differences amongst the three distinguished groups. In addition, even though the literature review from past research revealed significant results in similar studies; the results for the present research, however still did not coincide with what the researcher theorized the group of participants who are exposed to both auditory and visual learning techniques learnt words more accurately, than the participants in other groups who are exposed to only one modality that is either visual or auditory. This was also particularly observed after viewing the results from the one-way analysis as well as the data sheets that the researcher collected from the participants. Nevertheless, the Auditory and Visual group participants were the ones who got the most correct responses they were able to memorize and write the words in the correct sequence as asked by the researcher.

On the other hand, the researcher observed certain limitations while conducting the study. Since, there is evidence of similar research in the past; a larger group of participants could have yielded at least some significance in the current study. In addition, the area where the study was being conducted had other researchers present at the same time, conducting their respective studies, which made way to hindrances for the participants of this study. Each participant in this study was asked to do the learning task individually, with only the researcher present in the room and no other participants at a particular time; however the participants reported that they could not concentrate fully while memorizing as there were disturbances outside the room where the study was being conducted.

Other limitations that the researcher highlighted, those which interfered with the results of the study were that the words presented to participants were easy enough to learn as none of them complained about the level of difficulty, except for the participants who were in the auditory group and at times could not fully comprehend the words due to its ambiguity. On similar terms, for participants from an international background i.e. for those English was a second language, clearly understanding certain words in terms of the accent of the recorded voice could have been difficult. Also, the preference of using a particular learning modality by a participant could be another limitation, since the participants were assigned to their groups on a random basis and thereafter asked to perform on the learning task based on their group assignment. The researcher even observed that the recordings of the words that the participants were exposed through the audio-recorder were not extremely clear; even though they were consistent i.e. the words were recorded in a female's voice only. In addition, some participants perceived the study as being hard one when they were told that they would have to memorize a list of words and then write it in its sequence, even before judging the difficulty level. There

were some participants who feared their performance on the tasks assigned, while on the other hand there were those who did not follow the instructions given by the researcher, appropriately. Lastly, the researcher also observed that some participants did not take the study very seriously and didn't write the responses on the data sheet legibly.

Nevertheless, the overall indications of the study lead to the importance of multi-sensory approach that could be used as a helpful tool to impart learning, specifically amongst primary and secondary grade children and even amongst slow learners (dyslexic children). In addition, if the limitations of the study are amended, the results could yield significant results since, according to what the researcher observed while conducting the study, the participants using both the visual and auditory modalities were less anxious in terms of comfort level when compared to those who used only either visual or auditory.

References

- Budoff, M. & Quinlan, D. (1964). Auditory and visual learning in primary grade children. *Child Development, 35*, 583-586.
- De la Iglesia, J. Carmen F., Buceta, M. J. & Campos, A. (2005). Prose learning in children and adults with down syndrome: the use of visual and mental image strategies to improve recall. *Journal of Intellectual & Developmental Disability, 30*(4), 199-206.
- Felten, P. (2008). Visual literacy. *Academic Journal, 40* (6), 60-64.
- Most, T. & Greenbank, A. (2000). Auditory, visual, and auditory-visual perception of emotions by adolescents with and without learning disabilities, and their relationship to social skills. *Learning Disabilities Research & Practice, 15*(4), 171-178.

Newcomer, P.L. & Goodman, L. (1975). Effect of modality of instruction on the learning of meaningful and nonmeaningful material by auditory and visual learners. *The Journal of Special Education*, 9(3), 261-268.

Appendix A

List of words used in the study for both visual and auditory versions-

1. Agreement
2. Conscious
3. Stumble
4. Fiction
5. Obstinate
6. Rebellious
7. Photosynthesis
8. Orphan
9. Superficial
10. Empathy

Appendix B

Informed Consent Form

I, _____ (print name), understand that I will be taking part in a research project that requires me to learn a sequence of different words that are presented to me by the researcher. I am aware that I will be asked to recall the words that were narrated to me in the same sequence that they were presented. I am also aware that I may be observed by the researcher to determine how easily I am able to recall the list of words. Also, to the best of my knowledge, I am not experiencing any hearing or vision problems that could affect my ability to take part in this study. I understand that my participation in this study is strictly voluntary and that I may choose to withdraw from the study at any time without any penalty or prejudice. I should not incur any penalty or prejudice because I cannot complete the study. I understand that the information obtained from my responses will be analyzed only as part of aggregate data and that all identifying information will be absent from the data in order to ensure anonymity. I am also aware that my responses will be kept confidential and that data obtained from this study will only be available for research and educational purposes. I understand that any questions I may have regarding this study shall be answered by the researcher(s) involved to my satisfaction. Finally, I verify that I am at least 18 years of age and am legally able to give consent or that I am under the age of 18 but have on file with the LPP office, a completed parental consent form that allows me to give consent as a minor.

(Signature of participant)

Date: _____

(Signature of researchers obtaining consent)

Date: _____

Student Researcher's Name and Contact:

Mansi Brat

mb053@lionmail.lindenwood.edu

(636) 426-0719

Supervisor:

Dr. Michiko Nohara-LeClair

mnoharleclair@lindenwood.edu

(636) 949-4371

Appendix C

Feedback Letter

Thank you for participating in my study. My goal was to find out whether combining learning techniques makes learning or memorizing easier. My research consisted of three groups of participants; group 1- was the visual group, group 2- the auditory group and group 3- the visual and the auditory group. The hypothesis of my study states that the group of participants who are exposed to both auditory and visual learning techniques would be able to learn words more accurately, also retain them for a longer period of time than the participants in other groups who are exposed to only one modality that is either visual or auditory since, the mentioned technique involves the use of more than one sensory channel to impart learning.

Please note that we are not interested in your individual results; rather, we are only interested in the results of a large group of participants, of which you are now a part of. No identifying information about you will be associated with any of the findings.

If you have any questions or concerns regarding any portion of this study, please do not hesitate to bring them up now or in the future. Our contact information is found at the bottom of this letter. If you are interested in obtaining a summary of the findings of this study at a later date, please contact us and we will make it available to you at the completion of this project.

Thank you again for your valuable contribution to this study.

Sincerely,

Principal Investigator:

Mansi Brat
mb053@lionmail.lindenwood.edu
636-426-0719

Supervisor:

Dr. Michiko Nohara-LeClair
mnohara-leclair@lindenwood.edu
636-949-4371

Appendix D

Demographic Information

Please fill out the required information in this questionnaire:

1. Age: _____

2. Gender: _____

3. Class Rank: _____

4. Are you aware of any visual, auditory or other conditions you may have, that may interfere with your performance on the task today? Please select one:

YES

NO

I DON'T KNOW

Appendix E

DATA COLLECTION SHEET

Please fill in the blanks as per the sequence of words that you were exposed to by the researcher:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____