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Differing Listening and Memory Skills Between the Sexes

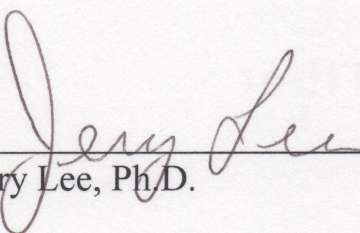
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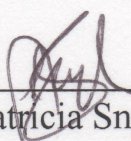
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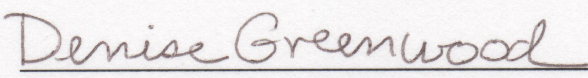
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DIFFERING LISTENING AND MEMORY SKILLS BETWEEN THE SEXES

Differing Listening and Memory Skills between the Sexes

Kimberly L. Thompson

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Abstract

Previous research has tested current stereotypes that suggest men and women do not listen to information that is not directly related to them. Researchers have looked at these stereotypes and tested if a presenter can affect an individual's ability to remember and interpret information. The current study investigated whether or not the presenter's gender had an effect on the participant's test score. The independent variables included gender of the participant and test score on the free recall task. The dependent variable was the sex of the presenter. Participants listened to an audio tutorial spoken by either a male or female. Following the tutorial, participants were asked to complete a short free recall test. Results indicated that there was no significance between test scores and gender of the speaker. Although not significant, participants scored higher when the presentation was given by a male.

Differing Listening and Memory Skills between the Sexes

Common stereotypes suggest that depending on the information being presented, individuals will listen to one sex vs. another. Researchers have looked at the race, sex, and speech style of presenters in order to determine if test performance changes in these different situations. Several studies have looked at speaker familiarity in order to determine if knowing a person will have an effect on memory. In addition, gender cues and information have been researched to determine if information pertaining to certain genders can affect the motivation to learn and understand information presented.

Interest in Information

Several stereotypes suggest that the ability to remember information can be affected by the person's interest in the information. Several researchers have taken this idea and used it to study if interest does have an effect on learning and memory. If interest does affect learning, perhaps there are new ways teachers can incorporate this finding into classrooms in an attempt to improve student performance.

With the increase in technology there are several ways to present information and many new ways to teach. With the introduction of PowerPoint into today's teaching, several researchers have questioned the effectiveness of lecturing and visual presentations on teaching and learning. In a study by Savoy, Proctor, and Salvendy (2009), the benefit of PowerPoint was studied. Researchers attempted to determine the best way to present information in order for maximum retention to occur. In order to study this, PowerPoint presentations and traditional lectures were used to compare test scores among students.

Sixty-two students participated in the study. Two lectures were presented during the experiment, one using the traditional lecture style and the other using a PowerPoint

presentation. The lectures covered material involving memory models and attention models. Traditional lectures used a professor and chalkboard presentation. The PowerPoint presentation used slides, but no animation was included. Most of the information was viewed on the slides and some information was verbally enforced by the professor (Savoy et al., 2009).

The experimenter measured the ability to recall information as the dependent variable. The experiment took place over a four week period during which lectures were given on Mondays and Wednesdays. The final week was used to give the quiz and a questionnaire. In order to eliminate the possibility of study effects, no prior warning was given to students about the. According to the first hypothesis, which stated that information presented in a PowerPoint would be difficult to recall, results were significant. Overall, participants scored 15% higher when taught using a traditional style lecture. This research suggests that verbal learning is more effective than visual learning (Savoy et al., 2009).

Aside from looking at different types of teaching methods, several researchers have looked at the role of social presence in learning and communication. Computer-mediated communication is a new form of technology that has been used in several capacities including teaching, studying, and basic communication. In the study by Yamada (2009), the relationship between social presence as determined by a media learner, and the output in communicative learning was tested. Synchronous computer-mediated learning includes videoconferencing (image and voice), audioconferencing (voice but no image), text chat with image (image but no voice), and plain text chat (no image and no voice) (Yamada, 2009).

Forty university students took part in the study and were randomly divided into four groups: videoconferencing, audioconferencing, text chat with images group, and plain text chat group. Participants did not know each other and were put into pairs and placed in a room with a laptop, webcam, and headset. The pairs were given a topic and had to take part in a 15 minute discussion with another individual. The same topic was used for all pairs. The groups had to either communicate through voice communication or in text chat. Groups were also video-recorded during their discussion. After the discussion, participants were asked to complete a questionnaire about presence of interlocutor and ease of communication (Yamada, 2009).

The results of this study found that there are two forms of consciousness “consciousness of the proximity to face-to-face communication” and “consciousness of language learning” (Yamada, 2009, p. 830). An interaction between image and communication tool was also found which suggests that the use of image and voice together gives learners a greater reason to pay attention and learn. Finally, the researchers found that voice communication strongly affects the learners’ output. If voice communication is as important as this study suggests, it supports the notion that learning is affected by the voice of the presenter (Yamada, 2009).

Phonological processing is another area of speaking that has been researched. In one study, Rost and McMurray (2009) investigated if the variability of the speaker would have an effect on phonological processing. Lexical neighbors for example, a pair of words that differ by a single phoneme, appear to have an effect on a person’s ability to differentiate the word. In this study, therefore, researchers used acoustics to determine if greater lexical neighbor learning could improve learning.

This study used 33, 14-month-olds that were normally developing and had no history of ear infection. Due to certain circumstances, only 16 children, 9 boys and 7 girls, made up the experimental set. The stimuli consisted of three digital photos and two sound files. The first two photos were used as habituation stimuli and the third was used as a novel control stimulus. The sounds used in the sound file were /buk/ and /puk/ and were spoken in a female's voice. The stimulus was presented through speakers and was viewed on a flat-screen monitor. After reaching habituation, infants were tested in three trials—same trials, switch trials, and novel trials. Same trials were a habituation object paired with the same word. Switch trials were same objects paired with the opposite word. Novel trials were an object not before seen paired with one or two words (Rost & McMurray, 2009).

The results of this experiment were that in the single-speaker condition the child was unable to recognize the difference between the two words. The infants in the multiple speaker condition were able to discriminate between the words. These results suggest that the voice of a speaker has an effect on the ability to recognize what is being said (Rost & McMurray, 2009).

In other studies regarding learning and memory, current stereotypes such as the belief that men and women do not listen to information that is not directly related to them has sparked further research in the field. In order to test this, Oakhill and Petrides (2007) conducted an experiment in which children were asked to rate how likely they would be interested in reading about two different situations. This study compared the reading comprehension of children that read both situations of interest and not of interest.

Researchers believed that the differences in reading comprehension could have been a result of lack of motivation or misunderstanding of the information presented.

The researchers asked 32 participants, 16 girls and 16 boys between the ages of 9 and 10 years to read two passages, one about spiders and one about children returning home during the Second World War. Questions for each passage were given and the children were asked to answer them. Questions were given in the form of short answers, several line answers, longer answers, and multiple choice answers. Children were tested in classroom conditions over three consecutive weeks (Oakhill & Petrides, 2007).

The results of this study showed that boys performed better on the passage about spiders, which they stated they preferred to read, more than the war passage. Girls, however, reported that they had a preference for reading the war story. Girl performance was not related to their interest in the passage. The results of this study suggest that, for boys, interest in information can have an effect on understanding and comprehension of the information (Oakhill & Petrides, 2007).

Auditory presentations are widely used, and one of the most important parts in creating these presentations is considering the voice that should be used. In a study by Chattopadhyay, Dahl, Ritchie, and Shahin (2003), consumer response based on announcer advertising was tested. Style of delivery, voice attractiveness, and rate of speaking are all important factors when trying to determine who should be a speaker for an important event or to portray important information. It is believed that an attractive voice may have an effect on the response consumers have to a product. This study is another great way to determine if the sex of the presenter influences how people interpret the information presented to them.

In this study, 166 undergraduate students participated. Eight experimental conditions were used, and participants were tested in groups of 5 or fewer. The participants were asked to listen to a radio program and then evaluate it. The presentation consisted of a radio broadcast followed by a short advertisement. Participants were asked to complete a questionnaire after the presentation (Chattopadhyay et al., 2003).

The results of the study showed that increasing speech rate was a form of distraction to viewers but that syllable speed influences consumer responses. Overall the results of this study suggest that the voice and presentation of the presenter, whether male or female, is extremely important to the understanding and comprehension of the person listening (Chattopadhyay et al., 2003).

Similar to studying the voice attractiveness of a broadcaster is a study which looks at the social agency theory. This theory suggests that social cues in messages can prime social conversation and can have an effect on the conversation produced. In a study by Mayer, Sobko, and Mautone (2003) researchers used two experiments to test the significance of the social agency theory and to determine if accents in a person's voice or computer based voices have an effect on retention.

Sixty-eight college students participated in the experiment which consisted of a participant questionnaire, retention test, four transfer test questions, and a speaker-rating survey (participants rated speakers on 15 dimensions). Participants were placed in either the male native-English speaker condition or the male speaker with a Russian accent condition. In experiment 2 the same procedures were using except a machine voice was added as a condition. Participants listened to a tutorial on how lightning works and then completed the questionnaires, tests, and surveys (Mayer et al., 2003).

Overall participants performed better in conditions where they listened to the native speaker with no accent rather than a speaker with an accent or a computer based voice. In the rater survey, students rated the speakers higher on social dimensions if they had the standard accent rather than the Russian accent or computer-based voice. Conclusions suggest that social cues such as the voice of the speaker can have an effect on learning and memory retention (Mayer et al., 2003).

Familiarity of Voices and Information

Another major area of study regarding learning and memory is the familiarity of the presenter and the information. Researchers have studied whether previous knowledge of the information and whether an amount of exposure to the information can affect a person's ability to retain the material. In addition, researchers have looked at whether familiarity of the presenter's voice can affect the learning and memory of an individual.

In a study by Cleary, Winfield, and Kostic (2007), auditory recognition was studied in order to determine if studied and unstudied words could be recognized without identification. Recognition without identification was defined by researchers as "the finding that when identification of recognition test items is hindered, participants can discriminate between unidentified studied and unidentified unstudied items" (p.1869). The purpose of this study was to determine if an effect could be found between auditory recognition without identification.

Participants included 29 students from Iowa State University. Stimuli were 120 words were used, all consisting of either two or three syllables. Words were spoken by a female voice. Words were presented by an auditory presentation program via a computer and 60 words were randomly chosen by the computer for each participant. Following the

presentation, a 15-item study list followed by a 30-item study list was given to the participants. A memory test followed. Results showed that participants identified significantly more studied words than unstudied. This result confirms that auditory priming is a good way to enforce learning (Cleary et al., 2007).

In addition to being able to recall information that pertains to the listener, researchers have studied whether the familiarity of a talker can have an effect on identification performance. In a study by Nygaard and Pisoni (1998) talker-specific learning was studied. The purpose of this study was to look at the process of perceptual learning and adaptation to individual talkers and to determine if talker identity has an effect on understanding specific parts of speech.

Sixty-six undergraduate and graduate students participated in this study. Four conditions including a trained experimental condition, trained control condition, and two untrained control conditions were used. Stimuli were presented in one of three sets and were selected from a database of 360 monosyllabic words spoken by 10 males and 10 females. Words were obtained from the Modified Rhyme Test and were recorded on an audiotape. Groups were required to complete nine training sessions over a two week period. During the training sessions, participants were asked to learn and be able to recognize the speaker's voice and be able to associate it with one of ten common names. A recognition task followed presentation of the words and finally a test phase was used in which listeners were asked to identify the speaker and associated names from each trial (Nygaard & Pisoni, 1998).

Results indicated that listeners showed a large individual difference in their ability to learn and identify the set of voices and words. Overall the results of the study showed

that the listeners who were given words produced by familiar talkers were able to identify the information better during the test phase than did listeners who were given words produced by an unfamiliar talker. These results suggest that gender-related speakers and cues have an effect on the learning and memory ability of the individual (Nygaard & Pisoni, 1998).

Source memory—the ability to recall where information was learned—is another important phenomenon that researchers have looked at in an attempt to study learning. In the current study by Senkfor and Van Petten (1998) researchers attempted to study source and item memory and its effects on event-related potentials. Event-related potentials or ERPs are, “small voltage fluctuations in the EEG that are time locked to sensory, motor, and cognitive events” (p.1006).

In this study, 12 men and 12 women ranging in age from 19 to 30 years participated as paid volunteers. The stimuli consisted of 1,088 concrete nouns which were recorded in either a male or female voice. EEGs were recorded and certain parts of the brain areas including the midline frontal, central, parietal, and lateral occipital were studied. In addition to measuring the EEG, horizontal eye movements were monitored (Senkfor & Van Petten, 1998).

The procedure in this study consisted of four sessions that lasted for about 2.5 hours each. The first session included an item study and recognition tests, the second session used a source study and recognition test. Participants were asked to study a set of 136 concrete nouns, half recorded in a male voice and the other half in a female voice. The participants were asked to construct a mental image of each object as well as decide if it was larger or smaller than a 10-in. X 10-in. square. The participants were able to

respond by pressing a key that said “larger” and “smaller”. Following these sessions, a recognition test was given and included the 136 words studied; however, half were in the same voice as studied and the other half were in a different voice. Participants were asked to determine if the words were old or new. The same study tasks from the first two sessions were used in sessions three and four, but participants were told that the speakers’ voices were going to be included in the recognition task (Senkfor & Van Petten, 1998).

The results of this study did not show any evidence that voice information is retrieved automatically when a word is recognized. In addition, measurements taken from ERPs, accuracy, and reaction time did not differ between the same voices versus a different voice heard during the study phase. These results seem to suggest that voices may not affect learning and memory ability. The results of this study do not support the hypothesis of the current study, but this information can be used to further test and understand the process of source and item memory (Senkfor & Van Petten, 1998).

Similar to the study by Senkfor and Van Petten, a study by Dodson, Holland, and Shimamura (1998) looked at source memory and recollection of information. In this study the researchers looked at the effect that specific and partial source information would have on the ability to recollect information presented to you.

Participants consisted of 42 paid volunteers who were assigned to either the different-gender or same-gender condition. The different-gender condition had participants listen to words spoken by two men and two women. The same-gender condition had participants listen to words spoken by four men. Participants first heard words spoken by four different voices depending on the condition they were placed in and later they were given a surprise memory test. Participants listened to the words and

were told to study the words and imagine hearing the person say the word again. The test phase consisted of identifying the speaker of the word and determining if the word had been heard earlier (Dodson et al., 1998).

The results of this study showed that full attention during the test resulted in participants remembering various amount of specific information about past events. Basically, the researchers concluded that the recollection of different kinds of source memories requires a different amount of attention. This information suggests that the amount of attention given to a source can have an effect on the individual's ability to remember as well as learn the information presented (Dodson et al., 1998).

The ability to recognize a spoken word is something that several researchers have studied in an attempt to determine what factors affect memory. In a study by Palmeri, Goldinger, and Pisoni (1993) researchers looked at recognition of memory for spoken words through the use of a continuous recognition memory task.

Participants included 200 undergraduate students who were tested in 5 different variability conditions. Groups of 5 or fewer were used and stimulus presentation took place through the use of a minicomputer and headphones. Lists of words spoken by a single talker or a multiple talker were presented and words were repeated a number of times during the presentation. Participants were asked to listen to the word and then had to judge if the word was new or old by pressing a button with the appropriate label (Palmeri et al., 1993).

Results of this study showed that an increase in the number of talkers did not affect the participant's ability to recognize the word. In addition, same-voice repetitions of words appeared to increase the accuracy of recognition in relation to different voice

repetitions. An interesting finding was that different-gender repetitions were recognized more accurately than same-gender repetitions, possibly suggesting that the sex of the speaker may have an effect on learning but in the opposite way that the current study hypothesizes (Palmeri et al., 1993).

Intentional and incidental learning was studied in a different experiment by Yonan and Sommers (2000). These researchers examined the impact of age differences on the ability to use voice information in different learning contexts in order to facilitate spoken word identification. According to findings from previous studies, listeners seem to retain voice information and use it to help with identification and recognition of previously heard words. The same word spoken by a man or a woman will have different acoustic properties which may have an effect on the listener's ability to recall or understand the word spoken. The following study investigated age and prior exposure to a person's voice and its effect on recognition of spoken words (Yonan & Sommers, 2000).

In this study, 23 young adults between the ages of 18 and 24 years and 66 and 87 years were recruited as participants. Stimuli were 200 high-predictability (HP) and 200 low-predictability (LP) sentences. LP sentences had a final word that was not predictable based on the context of the sentence. HP sentences had a final word that was predictable based on the context of the sentence. The stimuli were recorded by 12 speakers, 6 men and 6 women. Training, discrimination, and perceptual identification phases were used. In the second experiment the procedure was the same as in the first except that the voices of the speakers changed during test periods. Participants were trained on the voices and

then asked to discriminate information presented by the different speakers (Yonan & Sommers, 2000).

The results of this study suggest that older individuals have a more difficult time with explicit memory for voices and voice recognition than do younger individuals. Older participants showed improvement when they listened to information presented by a familiar speaker. These results suggest that voice training and speaker familiarity has an effect on learning as well as the possible understanding of information (Yonan & Sommers, 2000).

Other studies of auditory word recognition have researched if words embedded in noise are recognizable. In a study by Jackson and Morton (1984) researchers investigated the ability to recognize words presented in noise. Men and women between the ages of 20 and 60 were participants in this study and were tested in groups of 7-12 individuals. A test session presenting a list of 200 words played through white noise was used. A control group in which the noise level was reduced was used (Jackson & Morton, 1984).

Participants were informed that the first experiment was going to be concerned with comprehension of words that they were going to see and hear. They were asked to categorize the words they were presented as either living or nonliving. If the word was living, they were not to press the button. Following this part of the experiment, participants were given a response sheet and were told to listen to the words and write down the word they heard as quickly as possible (Jackson & Morton, 1984).

The data collected suggest that there is some type of facilitation of auditory recognition when visual priming is used. Auditory priming, however, has a greater effect on recall abilities. Results also implicated that effects of auditory priming on word

recognition did not depend on the voice that was heard. Based on this research, it can be suggested the prior presentation of information can have an effect on learning (Jackson & Morton, 1984).

In a study by Pilloti, Bergman, Gallo, Sommers, & Roediger (2000) implicit and explicit memory tests were used to determine if there was sensitivity to the characteristics of the stimuli presented during a study period.

Participants were 228 students from an undergraduate university. Auditory and visual perception was tested using three phases: study, a 5 minute break, and a test. A total of 320 words with 2 or 3 syllables was used in the experiment and were spoken by either a male or female voice. A block of 50 words was presented to participants through headphones, and they were asked to rate the familiarity of the words on a 7-point scale. The implicit test consisted of a speech perception test in which participants had to identify degraded words or complete word stems or fragments. An explicit recognition test was also used and participants were asked to write down if the words they saw were new or old words (Pilloti et al., 2000).

Results of the study suggested that visual presentation produced less priming than auditory presentation. When voices were changed between study and test situations an effect on the implicit test results was seen, suggesting that words were learned in conjunction with the presenter's voice. The researchers concluded that explicit and implicit auditory memory tests appear to differ in their sensitivity to the encoding of the information during a study period (Pilloti et al., 2000).

Additionally, researchers have examined whether or not physical characteristics can affect the ability to encode and recall information. Memory for events can occur in

several forms including retrieving information through episodic memory and constructing information from related events. In a study by Fisher and Cuervo (1983) researchers explored how memory for physical characteristics of spoken words can affect the ability to comprehend messages.

Sixty men and female undergraduate students participated in this study. The subjects were told they would listen to a recording about a divorce hearing and that they were to determine who was responsible for the breaking up of the family. There were three conditions. Participants in the voice condition listened to both a male and female voice explain the family situation during the tape recording. The narrator condition used an author which held up a card saying who was speaking during the tape recording. The control condition used the same voices heard in the voice condition. Following the recording, participants were asked to complete a test in which they were given statements and had to identify which speaker made each statement (Fisher & Cuervo, 1983).

The results of the study showed that participants were able to recognize the gender of the speaker more accurately when they were placed in a structured situation such as the narrator or voice situation. These results suggest that information about the presenter has an effect on an individual's ability to recall information (Fisher & Cuervo, 1983).

In a study by Goh (2005), talker variability and memory recognition was studied. Previous studies suggest that voice contexts can have an effect on an individual's ability to recall information and recognize the speaker. Some researchers question whether studied voices and unstudied voices differ in the ability to recall information. Spoken words have symbolic and index properties that can affect a person's ability to interpret

and recall information. In this study the main interest is whether participants will be able to retain information about voices that were studied during an experiment.

Sixty-six participants, who were either paid or given course credit, were used in the study. Four lists of 90 words were used as stimuli and each word was spoken by 10 male speakers. Five different voice conditions were used and participants were asked to identify the word spoken and then determine if the voice of the speaker was a learned voice (Goh, 2005).

The results of this study show that participants were best able to identify the words when they were spoken by the same voice. Hit performance declined when voices changed between words. When new words were presented, participants made several false alarms. These results confirm the beliefs that studied voices can have an effect on memory performance (Goh, 2005).

Gender

Gender is a common area of study for several researchers. In regards to learning and memory, many studies have looked at whether the gender of the presenter can affect the learner. It is often suggested that people relate better to those who are similar to them or to information of interest to them; this information has led several researchers to investigate whether males learn better when taught by males and females learn better when taught by females.

There are several theories that suggest gender effects in learning among individuals. Gender schema theorists suggest that there is a memory bias toward sex-related information. This theory follows closely with the hypothesis of the current study. Gender schemata often tend to lead to biased judgments and memories for gender-related

information. If selective memory for gender schemata is true, then this information can have a great effect on the understanding of cognitive processing in children and adults. In a study by Cherney (2005), the researcher investigated if the presentation of stimuli and encoding conditions has an influence on schematic processing.

One hundred and sixty participants between the ages of 5 and 13 and adults were included in the study. Two forms of memory, incidental—later recall of the pictures, and intentional—memorization of the pictures, were tested. Stimuli used were 72 sex-stereotyped toy photographs which were masculine, feminine, or neutral in nature. Participants were asked to rate the gender of the toys on a 7-point scale. Each participant was placed in either the incidental memory condition or the intentional memory condition and was tested individually. In addition to the memory conditions, a static and dynamic object condition was used. The static condition consisted of a static photograph while the dynamic condition involved a moving target (Cherney, 2005).

After being placed in the proper conditions, participants were asked to label each picture shown. After seeing all pictures, a 3-minute filler task was used and then participants were asked to tell the experimenter which toys he/she remembered viewing. The results of this study showed that there was no interaction between modality and the sex of the participant. Also discovered was that recall in the intentional memory condition was better than in the incidental memory condition. This finding could possibly suggest that being aware of what is going to be asked of you is a good way to encourage learning (Cherney, 2005).

Several researchers have looked at the effect of gender stereotypes on memory and learning. In a study by Wood, Groves, Bruce, Willoughby, and Desmarais (2003) the

ability to recall stereotypic knowledge when asked to learn new information while using the elaborative interrogation strategy was investigated. “Elaborative interrogation is a “why” questioning strategy that promotes memory by encouraging learners to connect new to-be-learned information to existing knowledge” (Wood et al., 2003).

The purpose of this study is to compare males’ and females’ use of elaborative interrogation when learning new information about males and females. Results of this study are important to the current study because it looks at how gender stereotypes can serve as a schema which provides structure and organization for the information that we hold about men and women (Wood et al., 2003).

In this research, 120 undergraduate students were placed in one of four experimental conditions: man facts only, woman facts only, or one of two counterbalanced mixed gender sets. The sets contained 32 sentences each describing a person engaged in a certain activity. The first phase of the study was instruction and practice where they were introduced to the elaborative interrogation technique. Following the first phase, a practice phase occurred and followed by an experimental phase (Wood et al., 2003).

The results of this study showed that female gender facts do not appear to have an impact on memory performance, but they do impact the performance on an elaborative interrogation strategy. The learners’ gender also had a significant effect on memory and females appeared to outperform males when using the technique. These results support the idea that different types of learning techniques and a persons’ gender can have an effect on memory (Wood et al., 2003).

People believe that men and women speak differently, but what needs to be answered is whether or not these differences affect learning and understanding of spoken words. Several stereotypes exist today regarding communication abilities and styles of men and women. Gender and racial stereotypes suggest that there are differences in speech style which can affect the way men and women interact. In a study by Popp, Donovan, Crawford, Marsh, and Peele (2003) researchers studied whether gender, race, and speech styles were all related.

This study used 170 undergraduate students ranging in age from 17 to 31 years. Participants were placed in one of four experimental conditions: black male target, black female target, white male target, or white female target. Participants were told that they were going to be studying art and literature. Filler questions pertaining to the accuracy and realism reflected in two pictures were used and participants were asked to create a dialogue for the pictures. Participants also had to describe physical characteristics of the target and then were asked to rate the targets speech on 36 different points. The final step included completing a self-report (Popp et al., 2003).

Results of this study showed that gender stereotypes tended to decrease over time. Women's speech was still believed to be less direct and more emotional than men's. Strong race effects were also found. Black Americans were scored as less socially appropriate in their speech and more offensive, direct, and argumentative. These results suggest that the race of a speaker can affect how a person interprets the information being presented. If the speaker is too direct the information can be interpreted in a negative fashion in turn affecting the understanding of the material (Popp et al., 2003).

Previous studies have looked at gender differences between remembering daily things such as grocery lists and directions. Some researchers suggest that individuals remember best things that relate to them such as women remembering household duties and men remembering things relating to hardware duties and direction giving. In a study by Colley, Ball, Kirby, Harvey, and Vingelen (2002) gender-linked differences in everyday memory performance was tested. Researchers hypothesized that differences between gender roles would have an effect on the memory abilities for tasks that were not directly related to people's gender roles. Although this hypothesis is a form of stereotyping, these beliefs have led to the increased number of research studies in this area.

According to researchers, "differences between men's and women's gender role socialization may result in variations in the amount of detail contained in the internal representations that guide information seeking and retrieval, and hence influence memory for gender-related information" (Colley et al., 2002, p. 577). In the current study, men and women were presented with a questionnaire about memory experiences. The questionnaire asked the participants to estimate how frequently they forgot information regarding everyday tasks, for example things they need from the grocery store but that are not written down on a list. Also, participants were asked to estimate the frequency of forgetting. Participants were required to recall a shopping list or directions and different tasks were given to males and females to determine if sex differences in the tasks existed (Colley et al., 2002).

Results of the study suggested that women were better at remembering names and shopping lists. Men, however, were better at remembering directions. In the experiment

with the shopping lists, recall varied depending on the label used to represent items. Gender cue labels appeared to affect whether or not the individual remembered the information. These results suggest that men and women often recall information pertaining to them better than information that does not pertain to them. According to the results of this study, gender-related cues can affect a learner's memory (Colley et al., 2002).

The current study investigates the importance that the sex of a presenter has on the overall understanding and comprehension of the information presented. In an attempt to control for knowledge of the task presented, an unfamiliar device was presented as a tutorial via an auditory presentation, and participants were given a memory task in order to measure if the sex of the presenter affected their overall ability to remember the information presented to them.

Method

Participants

Eighty-one (12 males and 69 females) Albright College students ranging in age from 18 to 24 were recruited from the following sources: the Albright College psychology participant pool, on campus organizations, and athletic teams. These students were enrolled in introductory level psychology courses and are receiving extra credit as an incentive for their participation. Participation was voluntary and informed consent was given by all participants. The study was approved by the Albright College Institutional Review Board.

Materials

An intake questionnaire was designed to obtain general demographic information about all participants including age, gender, and major. An audio tutorial describing the use of the GSR 2 Biofeedback Relaxation Model spoken by either a male or female was presented to the participant via a tape player. The instructions were obtained from the GSR 2 manual and describe the basic ways to use the machine. A memory task, prepared by the experimenter, asking questions about the proper use of the GSR 2, was given to participants.

Procedure

Participants were given a general consent form to complete prior to participation in the experiment. Participants were then asked to complete a demographic questionnaire, prepared by the experimenter. The design used was a 2x2 between subjects factorial in which participants were randomly assigned to either the male or female condition. Both males and females listened to either the male or female presentation of the audio tutorial. After listening to the tutorial, participants were given a short memory task in which they were asked to use free recall in order to answer questions pertaining to the presentation.

After completing the tasks, participants were debriefed regarding the true nature of the study. Their information was coded using a number system so that no results were connected with their names. Participants were thanked for their participation.

Results

Speaker gender did not affect participants' test scores. Speaker gender and participant gender also did not affect the participants test score. The means and standard deviations for gender and speaker gender can be seen in Table 1.

The statistical test used was a two way ANOVA for between subjects design. Test scores when compared to the participants gender was not statistically significant, $F(1, 81) = .36, p = .55$. Test scores when compared to the speakers gender were not statistically significant, $F(1, 81) = 2.05, p = .16$. There was no significance or interaction between participant gender and speaker gender, $F(1, 81) = .16, p = .69$. Although not significant, participants performed better on the memory task when the information was presented by a male voice.

Discussion

Past literature has reported mixed results when researching memory and voices. Several studies have focused on specific aspects of speech such as morphemes and accents and how they affect learning and comprehension. Other studies have looked at speaker familiarity and how it affects understanding of materials. The current study attempted to be more specific in its investigation and looked at whether or not a speaker's gender can affect the listener's ability to interpret and remember information. The current study found no significance for speaker gender and participant gender related to test scores. In the current study, however, participants performed better on the memory task when the tutorial was presented by a male speaker.

The results of this study are inconsistent with the findings in the study by Nygaard and Pisoni (1998) who discovered that gender-related speakers and cues have an effect on

learning and an individual's memory ability. This study showed that participants who were taught information by a certain speaker were not as likely to recognize that information when presented by a different speaker. These results suggest speaker familiarity can affect learning. A problem with the inconsistent findings between the current study and research by Nygaard and Pisoni (1998) could have to do with the length and type of task presented. The tutorial was very short and could have affected the participant's ability to find a familiar connection with the speaker. In addition to the length of the presentation, the type of material presented was not a familiar task and could have led to students not paying full attention to the information.

The current study assessed the effects of a speaker's gender on memory ability of the participant being tested in a free recall task. Results showed that there was no significance between speaker gender and test results. Results did show that participants performed better when the information was presented by a male. These results can be explained by a study from Rost and McMurray (2009) who researched phonological processing in the area of speaking and comprehension. The results of this study suggest that the voice of the speaker can have an affect on the ability to recognize information presented audibly. These results and the findings of the current study suggest that certain voices can lead to understanding or comprehending of information better.

Another study that can be used to explain better performance by males is the study by Chattopadhyay, Dahl, Ritchie, & Shahin (2003). In this study researchers looked at the voice of an announcer and its effects on the presentation of information. The results of this study showed that factors such as voice attractiveness and speech rate have a significant effect on the comprehension of information. The results of the current

study can be related to the results of this study and can lead to assumptions that the male voice was more attractive, resulting in better test performance from students in the male experimental group.

Gender differences have been studied in several capacities when looking at voices and learning. In the study by Colley, Ball, Kirby, Harvey, & Vingelen (2002) researchers looked at the differences in memory ability when tasks were given different gender categories. The results of this study were consistent with common beliefs that men and women remember information that is related to them or have gender related cues. In the current study, gender related cues were not used in the presentation; however, the results dealing with male performance could be due to a connection with the participants and the male presenter. Perhaps the participants are used to having a male professor and are able to relate to them better than to a female professor.

Source memory and attention is another area of concern for researchers interested in studying learning and memory. In the study by Dodson, Holland, & Shimamura (1998) researchers looked at whether full or partial attention had an effect on memory as well as the type of instructions given to the participant regarding the experiment. The results of this study, although inconsistent with the current study's findings, showed that attention affected ability to remember. In addition, the more information the participants were given regarding what they were going to have to do the better they performed. In the current study, participants were told that they would be given a free recall memory task. The results could be inconsistent because the participants were not told about the nature of the information they were going to be tested on.

The connection between speakers, information presentation, and memory ability has been studied in various ways throughout the years. The current study's findings show that there is no significance between the gender of participants and their test scores nor is there significance between the gender of the speaker and the participants' test scores. Several things may have confounded these results.

There were several limitations and confounds that may have affected the results of this study. The way in which the study was designed and executed may have left room for errors. The rate of presentation in both the male and female groups could have affected the participant's ability to understand the material. The information was also presented through an audio tape and may not have been clear enough for participants to fully attend and understand. Familiarity of the speaker's voice could have affected the participant's performance as well. Speakers were students from Albright's campus and may have been recognizable to some of the participants, therefore causing a problem with their results. In addition to presentation issues, the material presented was an unfamiliar procedure that may not have been of interest to most of the participants; therefore, lack of interest as well as understanding in the material could have an effect on how much the participant paid attention.

Several studies have focused on speakers and learning. In the future, more focus needs to be placed on the speaker's gender and its effects on an individual's ability to learn information. A longitudinal study with male and female professors teaching the same lectures may be useful in answering questions about the effects of a speaker's gender on learning and memory.

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Table 1

Test scores (number correct) based on participant and presenter gender

Gender	Male Voice		Female Voice	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Male	3.00	.00	2.71	1.11
Female	2.95	.91	2.44	.84

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