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Verbal Overshadowing and the Effects of Earwitness Testimony on the Likelihood of Correct Identification of Target Voices

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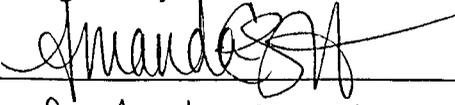## Honors Thesis Certification

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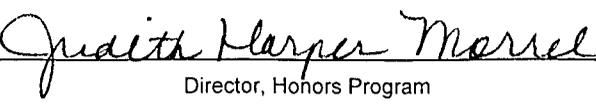
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Verbal Overshadowing and the Effects of Earwitness Testimony on the Likelihood

of Correct Identification of Target Voices

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Abstract

Verbal overshadowing is the process by which verbalizing memory interferes with the original memory (Schooler & Engstler-Schooler, 1990). While verbal overshadowing is robust with eyewitness events, it is not a definite occurrence. However, can verbal overshadowing affect memories of auditory information? Previous research on earwitness testimony has shown a verbal overshadowing effect in which the ability to accurately identify a witness's voice is impaired after verbally describing the voice participants heard (Perfect, Hunt, & Harris, 2002). I examined how voice lineup identification may be influenced by verbally describing a presented voice, a non-presented voice, or an unrelated event. Results did not suggest a verbal overshadowing effect when the presented voice was described.

Verbal Overshadowing and the Effects of Earwitness Testimony on the Likelihood

of Correct Identification of Target Voices

Verbal overshadowing is the process by which verbalizing memory interferes with the original memory (Schooler & Engstler-Schooler, 1990). Verbal overshadowing for eyewitness testimony was documented by Schooler and Engstler-Schooler through the use of displaying a theoretical bank robber's face to participants during a prompting video for 30 seconds, then presenting participants with an eight member lineup with the target picture (bank robber seen previously) included. The researchers found that those participants who wrote down a description of the target face prior to being shown the lineup had a harder time correctly identifying the target face, an effect that is now known as verbal overshadowing. Verbalization of the stimulus overshadows original memory for the face by altering the initial memory slightly. A person encodes a memory and then retrieves the memory during the verbalization process only to encode the new, revised memory thus slightly modifying the new memory from the original. Verbal overshadowing has been well documented for eyewitness testimony (Brown, & Lloyd-Jones, 2002; Lloyd-Jones, & Brown, 2008; Nakabayashi, Burton, Brandimonte, & Lloyd-Jones, 2012). However, if the participants are forced to make a decision when they are not confident in their choice, or if a verbal description of the stimulus, in this case a face, is presented before the stimulus (Huff and Schwan, 2008), the interference of verbalization of a stimulus goes away (Clare and Lewandowsky, 2004).

There are other ways of diminishing or eliminating the verbal overshadowing effect. Hunt and Carroll (2008) examined the effects of verbal overshadowing by asking subjects to imagine their own proximal or distal futures. Participants in the proximal

future condition, who were asked to think about events the following day, were found to show a great verbal overshadowing effect for face recognition. However, those who imagined a distal future, one that would be one year from the study date, had no such impairment. Even though verbal overshadowing is robust with eyewitness events, earwitness evidence is a relatively new field.

Previous research on earwitness testimony has shown a verbal overshadowing effect in which participants' ability to accurately identify a witness's voice is impaired after verbally describing the voice participants heard (Perfect, Hunt, & Harris, 2002). In their study, Perfect, Hunt, and Harris presented participants with a target voice, then gave them a distracter task. After the task, participants were either told to describe the target voice or were given an unfilled delay for the same length of time. All subjects were then presented with a six voice lineup, with the target voice present, and were asked to correctly identify the target voice. A significant verbal overshadowing effect was observed in that those who described the target voice were less likely to correctly identify the target voice in the lineup.

Vanags, Carroll, and Perfect (2005) expanded on the previous findings by focusing on target voices heard through a telephone. They found that those participants who were instructed to describe characteristics of the target voice were significantly less likely to correctly identify the voice in the subsequent lineup than the participants who were given a filler task for the same amount of time, thus indicating the presence of a strong verbal overshadowing effect.

There was contradictory evidence present between the two experiments though. Vanags, Carroll, and Perfect (2005) did not find a verbal overshadowing effect in

Experiment 1 when they compared target voices and participants of the same race to target voices different from the race of the participant. However, in Experiment 2, when they only compared target voices and participants of the same race, they did find a verbal overshadowing effect. It should be noted that the effect was found when the voices were manipulated so that they were presented as if originating from a telephone call. This discrepancy between voices manipulated to sound as if through a telephone and pure voices in the Vanags, Carroll, and Perfect (2005) findings is the basis of the current study.

Several researchers have found a reliable verbal overshadowing effect; however, no research has been done to see if the verbal overshadowing effect is present when participants describe a voice that they did not hear as part of the experiment. That is, is the verbal overshadowing effect limited to a verbal description of the voice that was recently heard or does it extend to a verbal description of any voice? If the verbal description of a voice is only dependent on that specific target voice, alternate voices would not impact a person's ability to recall a voice heard. If any verbal description of a voice, whether a target voice or not, can overshadow a person's memory of the target voice, the rates of falsely identifying or failing to identify voices, specifically in the judicial process and the courts, will increase dramatically.

By verbalizing information after initial encoding, a person is slightly altering the way they remember the information presented. This is crucial when applied to real world events such as the law where a witness's word can convict or exonerate a man. Brandimonte, and Collina, (2008) found this memory alteration to be alleviated by presenting visual and verbal cues during the recall of visual imagery items such as faces.

However, if no such cues are presented from outside sources other than an internal monologue from the observer, there is an interference of visual information due to this verbalization.

Additionally, the existence of an own-gender bias in the verbal overshadowing effect has yet to be explored thoroughly. Loven, Herlitz, and Rehnman, (2011) found that women's faces were more likely to be recalled after observation and women were more likely to correctly recall faces than men. Also, men did not display an own-gender bias for their preference of faces regardless of time spent observing the faces and attention devoted to the faces. An explanation for this would be the attention given to own-gender faces initially upon encoding being higher for women when looking at other women than for men looking at any face. Because womens' voices have an inherant gender bias to them, the current study only used male voices.

I hypothesized that those participants who were told to describe a target voice through verbalization would be subsequently less likely to correctly identify the voice in a lineup. I also predicted that female participants were more likely to correctly identify the target voice in the lineup regardless of condition than the male participants. Additionally, I anticipated a larger verbal overshadowing effect for those participants who described an alternate voice than those who merely described their morning routine.

Method

Participants

I recruited 36 students from psychology courses at Butler University (29 women, M_{age}= 20.3, SD = 1.00, 7 men, M_{age} = 19.4, SD = 1.50). Students received extra credit for participation at the discretion of the professors of each course or were paid ($5 Starbucks

gift card) for their participation. There were no restrictions on race, ethnicity, or gender, but participants all had to be at least 18 years of age.

Design

Participants were randomized into one of three conditions. In the "writing condition," participants described their morning routine (control). In the "target voice condition," participants described the target voice heard (verbal overshadowing). In the "alternate voice condition," or "Vader condition," participants described the voice of Darth Vader (verbal overshadowing voice not heard). The dependent variable was whether the participant correctly identifies the target voice after the six-voice lineup was presented.

Materials

All materials were presented to subjects on computers via MediaLab Research Software v2010.2.19. The computers were segregated from other outside noises for environmental control over surroundings while subjects participated. The six voices were recorded on a Samsung Galaxy S4 phone in a quiet setting as to reduce background noise making voices distinguishable. All vocal contributors said the same phrase with pauses in the same locations: "Just follow the instructions, don't press the alarm, and no one will get hurt." All vocal subjects were Caucasian male with Midwestern accents. The vocal subjects' ages ranged from 20-32 years. A logic matrix was used during the distracter phase to ensure no participant was able to complete the puzzle, allowing the participants' minds to constantly be working on unrelated procedures (see Appendix A). The distracter task was used to replicate the Perfect, Hunt, & Harris (2002) study.

Procedure

Participants began by completing the informed consent agreement and then progressed through four experimental phases. The four experiment phases were a listening phase, a distracter phase, a writing phase, and a final lineup/recognition phase.

During the listening phase, participants heard one of six randomly selected voices say, "Just follow the instructions, don't press the alarm, and no one will get hurt." Participants only heard one target voice, but an equal number of participants were assigned to each target voice condition. This was followed by a 10 minute distracter task in which participants attempted to solve a logic puzzle.

Upon completion of the distracter task, participants were instructed to write for five minutes and either describe in detail the actions and events undergone in their morning routine (control condition), the qualities and characteristics of the target voice they heard (verbal overshadowing voice-heard condition), or the qualities and characteristics of Darth Vader's voice (verbal overshadowing voice-not-heard condition). Darth Vader's voice was chosen because it is a well-known pop culture voice.

After the five minute writing task, participants were told they were going to hear six voices, one of which was the target voice they heard during the listening phase. Participants listened to the six randomly-ordered voices speak the same line, "Just follow the instructions, don't press the alarm, and no one will get hurt," and then were asked to identify which of the six voices was the same as the target voice they heard previously. Participants also rated their confidence in their choice from 1 (not at all confident) to 10 (very confident). After the participants completed the experiment and filled out a demographics questionnaire (see Appendix B), they were thanked, debriefed, and informed that the purpose of the experiment was to replicate previous verbal

overshadowing findings and to investigate whether describing an alternative voice would produce the same verbal overshadowing effect.

Results

I set out with the goal of finding a verbal overshadowing effect for audible stimuli. The writing condition variable (morning routine, target voice, and Darth Vader voice description) was compared using the chi square non-parametric analysis across gender and condition. A non-significant effect for writing conditions (morning routine vs. describing target voice vs. describing Darth Vader) by voice choice was found across all conditions X^2 (2, N = 36) = .90, p > .05 (Table 1), which indicates no overall verbal overshadowing effect. Voice choice across gender was also non-significant X^2 (1, N = 36) = .887, p > .05.

Discussion

The purpose of this study was to find evidence of a verbal overshadowing effect from auditory stimuli as opposed to the visual stimuli presented in previous studies (Brandimonte, & Collina, 2008; Brown, & Lloyd-Jones, 2002). However, no significance was found across any conditions. This is not the first time that verbal overshadowing was not able to affect auditory stimuli though. Vanags, Carroll, and Perfect (2005) found no evidence of verbal overshadowing when participants heard voices in their pure form as opposed to voices manipulated to sound as if from a telephone call.

There were several areas in which this experiment could be improved for future research. Apart from the low sample size increasing, the six different voices could be looked at more closely to see if they are actually differentiable at all, because if I

inadvertently used six voices that all sounded too similar so that participants were guessing at chance regardless of their randomly-assigned condition, that would not allow for any differences to be shown, thus limiting both the power and effectiveness of my manipulation. An increase in sample size would allow gender differences to be properly explored as well as increase power overall.

The quality of the vocal recording could also be examined for the future. When Vanags, Carroll and Perfect ran their studies in 2005, the experiment in which they had clear vocal recordings did not find any evidence of a verbal overshadowing effect. It was only when they used recordings that sounded as if from a telephone that the found support for auditory verbal overshadowing. My study used a phone recording, but the quality of the recording may have been too high compared with the original literature.

I am not deterred by my findings, for verbal overshadowing with visual stimuli is still a major issue with regards to the judicial system and how eyewitnesses are handled. Demarchi, Py, Groud-Than, Parain, and Brunel (2013) may have begun to solve the issue of verbal overshadowing impacting the court system by presenting an alternative to the traditional eyewitness interview methods. By constructing interview questions that do not limit or lead eyewitnesses helps to better gain a more completed picture of the eyewitness's memory. Investigators are able to eliminate or at least reduce some of the effects of verbal overshadowing by utilizing this method. When these effects are reduced, facial recognition is higher and as a result eyewitness testimony increases in reliability.

Decreasing eyewitness errors made when testifying in court needs to be stressed. With technology increasing at the rate it is and access to information being at an all time

high, research into ways to limit earwitness and eyewitness mistakes is of utmost importance and verbal overshadowing effects are huge components of that research. With the conflicting research into earwitness verbal overshadowing, a swift and proficient approach towards researching the effect needs to take place. Every day society does not have an answer is another day courtroom testimony may be flawed. However, as long as research takes a practical direction in assessing this issue through continued study, the problems with eyewitness and earwitness testimony will drastically be reduced.

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Table 1

Results of Chi-square Test and Descriptive Statistics for Accuracy of Voice Identification by Writing Condition

Accuracy of Voice Identification	Writing Condition		
	Target Voice	Darth Vader	Morning Routine
Accurate	6 (50%)	8 (67%)	6 (50%)
Inaccurate	6 (50%)	4 (33%)	6 (50%)

Note. $\chi^2 = 0.90$, *df* = 2. Numbers in parentheses indicate column percentages.

p > .05

Appendix A.

Logic Matrix.

1. Walker finished before the person whose phone number is 589-2812.
2. Either the person whose phone number is 445-7953 or the person whose phone number is 502-9182 is Amya.
3. The person whose table is made of cypress can't be reached at 867-5309.
4. The 5 people were the person whose table is made of cypress, the runner who finished with a time of 3 min, 19 sec, Brody, the person whose phone number is 502-9182, and the person whose table is made of walnut.
5. The person whose table is made of rosewood finished before the person whose phone number is 867-5309.
6. Of Amya and the person whose phone number is 281-0911, one completed the race at 3 min, 5 sec and the other has the table made of fir.
7. Walker finished after the person whose phone number is 281-0911.
8. The runner who finished with a time of 3 min, 5 sec can be reached at 445-7953.
9. The person whose table is made of cypress is Francesca.

Appendix B.

Demographic Questionnaire.

1) What is your age?   _____

2) What is your gender?   Male   Female

3) How many years of education have you had?   _____

                K-12 = 13

                BA = 17

                MA = 19-20

                PhD = 22-27

4) What hand do you write with?   Left   Right

5) What is your eye color?   _____