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The Influence of Description and Retrieval Processes

on the Verbal Overshadowing Effect

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Abstract

The purpose of the present study was to determine if manipulating the type of description

elicited so that the processes used would match the processes used on an identification task

later on would allow one to overcome the verbal overshadowing effect. Forty-seven

participants (26 females, 19 males) viewed a face and were then instructed to complete either

a featural description, character description or no description. They were then required to

complete one of two identification tasks: reconstruction or identification from a line up. Z-tests

revealed that no significant differences existed in accuracy between the three description

conditions. Additionally there was no statistically significant evidence of the presence of the

verbal overshadowing effect.

Effects of Description and Retrieval Processes on the Verbal Overshadowing Effect

Eyewitnesses' descriptions of perpetrators are often crucial to starting an investigation. Because these descriptions are so important, much research has been done investigating how accurate these reports are, and how susceptible they are to manipulation (e.g. Schooler & Engstler-Schooler, 1990; Meissner, Brigham & Young, 2001; Clare & Lewandowsky, 2004; Lloyd-Jones, Brown & Clark, 2006). One effect that has been found and replicated in many studies is the verbal overshadowing effect. The verbal overshadowing effect is the relatively consistent finding that verbally describing a face impairs subsequent recognition performance. The verbal overshadowing effect and one potential cause of it is the primary focus of the present study.

Many theories have been proposed to explain the occurrence of the verbal overshadowing effect. One theory proposed by Meissner, Brigham and Young (2001) is that the verbal overshadowing effect occurs because verbalization causes witnesses to generate misinformation about the target face. This misinformation then impairs subsequent recognition. To examine the impact of misinformation Meissner et al. (2001) manipulated the level of response criterion during description generation to determine its effect on producing overshadowing on a subsequent identification task. In their study they manipulated the criterion level on the description task: forced recall (produce greatest number of errors in description), standard recall, warning recall (produce few errors in description) and a no description control. Their results showed that participants in the warning condition had the best performance on a later identification task while those in the forced recall condition performed the worst. Interestingly, they did not find evidence of the verbal overshadowing effect in the standard recall condition when compared to the no description control condition.

This supported their hypothesis that response criterion not only effects description accuracy, but also has an effect on the presence or absence of the verbal overshadowing effect. They hypothesized that the absence of verbal overshadowing was due to the number of errors present in the description generated. Those who generated fewer incorrect details in their descriptions were more likely to be accurate in a subsequent line up task.

Another theory to explain the verbal overshadowing effect was put forth by Clare and Lewandowsky (2004). They also conducted a study investigating criterion level and its effect on verbal overshadowing, however they manipulated criterion in a different manner. They sought to test if one's criterion level for selecting an image from a line up during the identification phase would be influenced by previous verbalization. Clare and Lewandowsky manipulated the type of description given so that one group generated a holistic description, another group generated a featural description, and a third group generated no description. The results indicated that verbalization had an effect on one's criterion level in that it increased it and reduced the likelihood that an image would be chosen from a line up. In cases where a perpetrator-absent line up was used, this resulted in greater accuracy. There were no differences found between the participants who generated a holistic description and those who generated a featural description. In addition, when they tested a forced-choice condition, no differences were found in accuracy between the three groups. These findings provide an explanation for why in certain instances verbalization has a positive effect on identification.

Schooler (2002) conducted an analysis of existing studies that investigated the verbal overshadowing effect. Upon reviewing these studies, he suggested that one explanation for the verbal overshadowing effect stems from the possibility of a "transfer-inappropriate

processing shift". In other words, verbalization may cause participants to shift their processing during identification and engage in operations that are incongruent with the processes initially employed during encoding and necessary for successful identification. Specifically, Schooler suggests that requiring witnesses to describe a face leads them to create a verbally biased memory representation of the face. When the same witnesses are asked to identify the previously witnessed (and described) face, they typically do so through recognition on a line up test. Accurate identification from a line up relies on the non-verbal processing used during encoding. However, this non-verbal processing is de-emphasized because of the verbal processing employed during the description task. Therefore identification is impaired.

Lloyd-Jones, Brown and Clark (2006) conducted a study that demonstrated support for this transfer-inappropriate processing shift, however their study suggested the processes used were slightly different than those mentioned by Schooler (2002). Previous work has indicated that faces are naturally encoded in a holistic manner (Wells & Hryciw, 1984). Lloyd-Jones et al.'s (2006) study indicated that verbally describing a face encourages a shift from holistic processing used during encoding to feature-based processing of the face. This shift to feature-based processing was believed to diminish subsequent identification accuracy. Lloyd-Jones and his colleagues also demonstrated that this shift to feature-based processing caused by verbalization is relatively long-lasting and generalizes to effect identification of novel faces. These findings emerged from a study in which Lloyd-Jones et al. instructed participants to view 12 faces and then describe a 13th face. The participants were then presented with a combination of the first 12 faces (the previously described face was not included), 12 new faces and 24 non-faces and they were required to distinguish the faces from the non-faces. Those

participants who did not describe a face were significantly faster in their reaction times in distinguishing faces from non-faces compared to those participants who previously described a face.

In addition, existing evidence on memory for faces from the work of Wells & Hryciw (1984) demonstrates that a match between encoding and retrieval processes enhances accurate facial identification. Wells & Hryciw manipulated the encoding processes in which participants engaged by requiring them to describe specific features or describe characteristics of a face while they were viewing it. In this manner, Wells and his colleague sought to manipulate encoding so that participants either engaged in feature-based encoding processes or holistic encoding processes. They then had participants engage in one of two identification tasks: reconstruction (which required feature-based processing) or identification from a line up (which required holistic processing). When there was a match between encoding and retrieval processes, memory was enhanced. When there was a mismatch, memory was diminished.

With previous findings in mind (Lloyd-Jones, Brown & Clark, 2006; Schooler, 2002; & Wells & Hryciw, 1984), it seemed reasonable to suspect that the verbal overshadowing effect may be attenuated or eliminated if processes employed during verbalization of the face were the same as the processes used during identification. To this end, I hypothesized that when there was a match between the type of processes used during the description generation (featural or holistic) and retrieval (featural or holistic) memory would be enhanced and the verbal overshadowing effect would not be present. When there was a mismatch between these processes, there would be evidence of the verbal overshadowing effect.

Method

Participants

Forty-seven undergraduate, General Psychology and Developmental Psychology students (28 females and 19 males) from Gustavus Adolphus College participated in this study. The psychology students ranged in ages from 18 to 23 years old. They were informed about the opportunity to participate in this study by their professors and they were offered one extra credit point in exchange for their participation.

Materials

Target and Sequential Line up images

There was a set of male faces created and a set of female faces created. The program FaceGen was used to alter the picture of one male into one target face and four foils. Two pictures of females were used to create one target face and four foils (See Figures 1 and 2 for pictures). Two copies of all of the pictures were printed in black and white and were laminated.

Reconstruction Test Faces

The program PAINT was used to manipulate the target male face and target female face to white out the features (eyes, nose and mouth). These images were then printed in black and white and laminated. The eyes including the eyebrows, nose and mouth were cut out of the target face and foils for both the male and female pictures to be used in the reconstruction task along with the picture of the target face with the features whited out (See Figure 3 for cut out features).

Filler Images

An image of a dog, a bird, a building and a tree were printed from the internet in black and white. They were then laminated.

Procedures

The experiment had a 3x2 design. Participants were randomly assigned one of three description tasks: description emphasizing physical features (n=16), description emphasizing character traits (n=16), or a no description control condition (n=15). They were also randomly assigned one of two recognition tasks: reconstruction using facial features (n=19) or identification from a sequential line up (n=26). There were a greater number of participants in the line up condition as a result of a qualifier being added to the line up identification instructions after several participants had chosen the first image shown. Initially the participants run prior to the addition of the qualifier were going to be eliminated from use in the study, but after reviewing the data no significant differences were found in the data obtained prior to the qualifier and the data collected after the qualifier was added. Therefore the previous data were included. All participants were tested individually and viewed either the target male face or target female face along with four other images: bird, dog, tree and building. Each image was shown sequentially for five seconds. After each picture was shown, the participants were asked to record on an answer sheet how interesting they thought the picture was on a scale from 1 (not at all interesting) to 5 (very interesting). The images were shown in random order, except for the target face which was always the third image shown.

All participants were then asked to work on a Sudoku puzzle for five minutes which served as a filler task (length of filler task based on that used by Meissner, Brigham and Kelley, 2001). The filler task was employed to serve as a retention interval between encoding and the description task.

Following the five minute filler task, all participants were given a sheet of paper with instructions on it. Those individuals assigned to the physical feature description condition were given a sheet of paper that instructed them to write a description of the face they had previously seen emphasizing physical features (based on features used by Wells and Hryciw, 1984). They were asked to describe the eyes (close together-far apart, narrow-wide), nose (long-short, narrow-broad), eyebrows (thin-thick), lips (thin-full) and other facial features to encourage feature-based processing of the previously seen face (See Appendix A for description instructions). Participants that were assigned to the character traits description condition were given a sheet of paper that instructed them to write a description of the face they had previously seen emphasizing character traits (based on traits used by Wells and Hryciw, 1984). They were asked to describe characteristics such as honest-dishonest, aggressive-passive, intelligent-unintelligent, kind-mean, generous-greedy, etc to encourage holistic processing of the previously seen face (See Appendix A for description instructions). Participants in the control condition were given a sheet of paper that asked them to put a list of occupations into six groups. They were told they could group the occupations together in any way they wanted to. This task was adapted from a similar tasked used by Clare and Lewandowsky (2004). This task was used to ensure that participants in the control condition did not complete any processing of the previously seen face that would be akin to the processing used during verbalization. All participants were given as much time as they needed to complete the tasks. On the occasions when participants asked how much they needed to write for the description tasks, they were told they could write as much as they wanted to and they were free to stop writing when they wanted to.

The description phase of the experiment was followed by another filler task that served as a retention interval between the description task and the identification test. Participants were asked to work on the same Sudoku puzzle they had previously been given for an additional five minutes. If they completed the Sudoku puzzle, they were given another one to work on.

The next phase of the experiment was the identification test. Participants in the reconstruction condition were given the face without features and the cut out features. They were instructed to reconstruct the face they had previously seen. There were a total of five eyes, five noses and five mouths for the participants to select the correct features from. There was no time limit to complete this task. Participants in the line up condition were instructed they would be shown pictures of faces, one at a time, and they had to decide if the picture they were being shown was the same as the picture of the face they had previously seen. They were told they would need to say "yes" or "no" before moving on to the next picture. The participants were also told that there were subtle differences between the pictures; the pictures were fairly similar. This qualifier was added after several participants had chosen the first picture shown. Participants were not informed how many pictures they would be shown. They were also not told that the target image would be present. The pictures were randomized and each picture was shown until a "yes" or "no" response was given.

Following the conclusion of the identification task, all participants were given a confidence survey. They were asked to indicate how confident they were in their reconstruction or recognition on a scale of 1 (not very confident) to 5 (very confident).

The participants were then debriefed and given a receipt as proof of their participation. They were assured that if they wanted their data excluded from the study that could be arranged. They were informed that the results would be presented at the Gustavus Adolphus College Spring Psychology Symposium.

Results

The descriptions were analyzed to determine if participants followed the directions and wrote the type of description they were instructed to write, and therefore engaged in the type of processing encouraged by the specific type of description. The descriptions were analyzed for content: number of feature words (i.e. eyes, nose, mouth, etc.), number of character words (honest, generous, mean, etc.) and total number of words (Refer to Appendix B for description examples). The character descriptions mentioned very few feature words (mean = .73); the featural descriptions mentioned no character words (mean = 0). Therefore, it appears that participants wrote the type of description they were instructed to write. Both types of descriptions were similar in the number of words specific to the description: featural description on average contained 7.4 feature words, character descriptions contained on average 7.6 character words. The total words were very similar for the two types of descriptions as well (feature description mean = 31.5, character description mean = 28.9).

Next the results on the line up task were analyzed to determine if there was an effect for description condition. Accuracy on line up identification was defined simply as selecting the correct image from the line up. A Z-test was used to analyze the results, and it was found that none of the differences between the description conditions reached significance (Refer to

Figure 4). Forty-four percent of participants in the featural description condition were correct at identifying the image on the line up, compared to 37.5% of participants who were correct in the no description control condition. Although it appears that participants in the featural description condition were more accurate, the difference was not statistically significant (p>.10). A Z-test was used to compare the mean accuracy in the featural description condition (44%) and the character description condition (22%) as well. Although the difference is even greater than the previous comparison, it was not statistically significant (p>.10). Likewise a Z-test comparing the character description condition and no description control condition was also not statistically significant (p>.10). Thus whereas it appears that the verbal overshadowing effect may have occurred in the character description condition, the effect did not reach statistical significance.

A Z-test was also used to evaluate the difference in degree of accuracy on the reconstruction task based on description type. Degree of accuracy on this test was measured by the total number of features identified correctly divided by the total number of features chosen all together (each participant had to choose 3 features: eyes, nose and mouth). The findings were similar to those found in the line up condition in that those in the featural description condition had the greatest accuracy (33%), those in the character description condition had the lowest accuracy (22%), and those in the control condition were in the middle (27.8%). None of the comparisons were statistically significant (p>.10 for all comparisons).

The confidence survey data was then examined to determine if there was any relationship between confidence rating and accuracy. No statistical analyses were completed due to small sample size, however an interesting pattern was observed for those participants

who completed the line up identification task. As shown in Table 1, across all description types those participants who were inaccurate at identifying the correct image from the line up were likely to rate their confidence higher than those participants who were accurate at identifying the correct image from the line up.

Discussion

In my study I sought to determine if manipulating the processes used during the production of a description so that they matched the processes used during retrieval would allow one to overcome the verbal overshadowing effect. The verbal overshadowing effect was not seen in any of the conditions, and in fact the participants in the featural description condition were better on both types of identification tasks (featural and holistic) than the control and character description condition participants.   It is possible that the verbal overshadowing effect was present in the character description condition and that the difference in accuracy did not reach significance due to small sample size.

The superiority of participants' accuracy in the featural description condition could potentially be explained by Meissner, Brigham and Young's (2001) explanation of why the verbal overshadowing effect occurs. In their study the more misinformation that participants generated in their descriptions, the greater the likelihood of the verbal overshadowing effect. Although there were not any explicit errors mentioned in the descriptions, it is possible that participants in the character description condition generated misinformation implicitly when they completed their descriptions. Participants in the featural description condition may not have implicitly generated this misinformation because they focused on features; thus those in the character description condition performed worse on subsequent identification tasks.

However, due to the subjective nature of perceived character traits, it would be very difficult to determine if those in the character description condition did implicitly generate misinformation.

The relatively high accuracy rate in the featural description condition compared to the other two conditions could also be explained by the nature of the stimuli and how verbally similar or dissimilar the target was from the foils. When verbalization includes elements that distinguish a target from foils, verbalization is beneficial for memory (Schooler & Engstler-Schooler, 1990).   It may be that the featural descriptions included some elements that distinguished the target face from the foils. The target and foils may have been verbally similar in regards to their character traits, and this may be why verbalization was not helpful for those in this condition, and actually appears to have been detrimental.

Another possible explanation for the results could be explained by the type of encoding the participants engaged in. It was assumed that participants would encode the images holistically because previous studies have shown there is a natural tendency to do so (Wells & Hryciw, 1984). However, because there were minimal features for participants to focus on (images printed in black and white so no skin tone, no hair etc.) it is possible that they encoded the images in a feature-based manner. This would then align with the match/mismatch theory of Wells & Hryciw (1984) and explain why those participants in the featural description condition were superior to the participants in the other two conditions on both types of recognition tasks. If the participants encoded the images featurally, and were then asked to provide a feature-based description, this match may have strengthened the memory and allowed for greater overall accuracy for these participants.   Those participants that had

encoded featurally and were then asked to provide a description emphasizing character traits were at a disadvantage because the processes used during description generation did not align with those used during encoding.

Additionally, I had hypothesized that if the description processes matched the retrieval processes then memory would be enhanced, however this does not seem to be the case. This may be due to the nature of the identification tasks. Overall, participants in all description conditions had lower overall accuracy on the reconstruction task than on the line up task. This may be a result of the reconstruction task being more difficult than the line up task. In the line up task, accuracy depended on participants selecting the correct image. They only needed to recognize one element of the face in order to say "yes" and select the correct face. Also, since there were only five faces to choose from, participants had a 1 in 5 chance of identifying the correct face simply by guessing. In the reconstruction task participants had to select 3 features correctly (eyes, nose and mouth) in order to be accurate.   Thus there were greater opportunities for participants to choose incorrectly.

Whereas there are many possible explanations for why I obtained these results, a replication of the study using a larger and more representative sample size should be done to clarify what actually is responsible for these results. The differences in accuracy between the three groups did not reach significance, but an interesting pattern was found that does not coincide with previous research. This warrants further investigation. A pilot study should be completed to assess the realistic qualities of the images used. It would also be beneficial to explore the encoding processes individuals are engaging in.   Perhaps if there is a match between encoding processes and those used during the description generation, there need not

be a match with the processes employed during retrieval for an identification task. Further study into how many processes should match in order for optimal recognition performance should also be explored.

In summary, it is not clear what effect description generation processes and retrieval processes for an identification task have on verbal overshadowing. It is unclear if a match between these processes facilitates memory, or if the processes used during encoding are more predictive of subsequent identification accuracy. Further inquiry is warranted.

References

(2004). FaceGen (Version 3.1.4) [Computer software]. Vancouver, B. C.: Singular Inversions.

Clare, J. & Lewandowsky, S. (2004). Verbalizing facial memory: Criterion effects in verbal

overshadowing. *Learning, Memory, and Cognition: 30(4),* 739-755.

Lloyd-Jones, T. J., Brown, C., & Clarke, S. (2006). Verbal overshadowing of perceptual

discrimination. *Psychonomic Bulletin & Review: 13(2),* 269-274.

Meissner, C. A., Brigham, J. C., & Kelley, C. M. (2001). The influence of retrieval processes in

verbal overshadowing. *Memory & Cognition: 29(1),* 176-196.

Microsoft (2001). Paint (Version 5.1) [Computer software]. Microsoft Corporation.

Schooler, J. W. (2002). Verbalization produces a transfer inappropriate processing shift.

Applied Cognitive Psychology: 16, 989-997.

Schooler, J. W., & Engstler-Schooler, T. Y. (1990). Verbal overshadowing of visual memories:

some things are better left unsaid. *Cognitive Psychology: 22(1),* 36-71.

Wells, G. L., & Hryciw, B. (1984). Memory for faces: Encoding and retrieval operations.

Memory & Cognition: 12(4), 338-344.

Table 1

Confidence Survey Data for Participants Completing a Line Up. The confidence levels are listed at the top of the table. Each number within the table represents how many people ranked their confidence at each level.

	Line up Condition				
	1 Not at all Confident	2	3	4	5 Very Confident
Featural Description Accurate	1	1	2		
Featural Description Inaccurate		1	1	3	
Character Description Accurate		1	1		
Character Description Inaccurate			2	5	
No Description Control Accurate		1	2		
No Description Control Inaccurate			1	4	1

Figure Captions

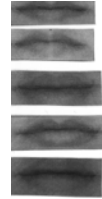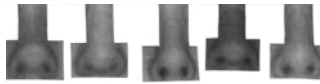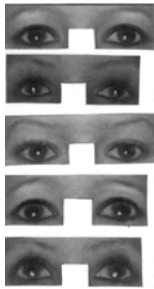*Figure 1.* Female faces used as target (3rd face) and foils.
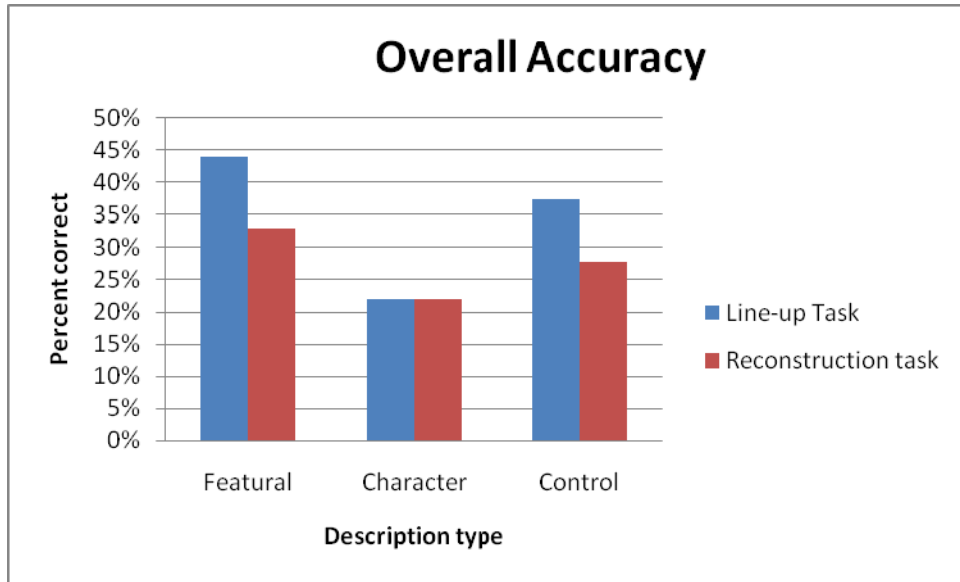
Figure 2. Male faces used as target (3rd face) and foils.

Figure 3. Whited-out female face and features used for reconstruction task.

Figure 4. Overall accuracy of description conditions.

Overall Accuracy

Appendix A

Description Directions

Featural Description Condition. Thinking back to the face in the picture you just saw, please describe what the face looked like emphasizing physical features. Ex. Eyes: close together-far apart, narrow-wide; nose: long-short, narrow-broad; lips: thin-full; eyebrows: thin-thick; cheekbones: prominent-indistinctive; jaw line: angular-rounded; face shape: long-short, narrow-wide; etc.

Character Description Condition. Thinking back to the face in the picture you just saw, please describe what type of person they were, emphasizing personality characteristics. Ex. Honest-dishonest, aggressive-passive, intelligent-unintelligent, kind-mean, generous-greedy, imaginative-unimaginative, arrogant-modest, friendly-unfriendly, etc.

Appendix B

Description Examples

      Featural Description. Eyes close together, long nose, thin lips, eyebrows THICK, angular face shape-long, cheek bones prominent

      Character Description. The person looked motionless. The person is however very intelligent. The person is sure what they want in life but is confused how to get there. The person is not very imaginative but however does not care too much about it. If you were to talk to this person they would probably have many things to say. This person is very polite as well and cares less what others think of them.