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Modes of Metaphor and Me: The Role Shyness Plays in the Interpretation of Visual and Verbal Metaphors

BY

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ABSTRACT

This thesis examines whether or not one's level of shyness affects one's interpretation of visual and verbal metaphors. Current research demonstrates that shyness correlates positively with more negative interpretations of counterfactual irony and that personality traits are related to certain themes in metaphor production. However, there is a lack of research in regards to how personality influences visual and verbal metaphor interpretation. The current task required participants to paraphrase the interpreted meaning of a collection of visual and verbal metaphors and rate each item on a Likert scale in terms of its familiarity, enjoyment, and polarity. Half of the interpretation task had an image of a face (male or female) presented alongside the metaphors to mimic a human observer. Lastly, participants read a series of statements from a shyness scale, rating each item on how much it applied to them. The study had three main hypotheses: high-shy individuals would interpret metaphors as more negative; high-shy individuals would interpret the metaphors with the observant face next to them as more negative; visual metaphors would gather more extreme responses on emotional ratings. The analysis did not support these hypotheses. No significant correlation was found between one's level of shyness and the rating scale responses. Additionally, no significant finding was found regarding the presence or absence of the observant face. Verbal metaphors received higher ratings on all three rating scales and produced higher polarity ratings for positive metaphors compared to those in the visual modality. Findings suggest that shyness does not have an overt effect on metaphor interpretation and that metaphors in the verbal modality are strongly preferred over those in the verbal modality. The study aims to contribute to our understanding of our personality's role in interpreting language in multiple modalities.

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CHAPTER 1. INTRODUCTION AND BACKGROUND

Language is a critical means of interaction between individuals, providing a way to express thoughts, ideas, and information. Utterances may be literal, where words or phrases have a direct and straightforward meaning. However, language may also be figurative, where there is not a direct relationship between the language used and the meaning it conveys. For example, one may say, "The sky is a painting." This utterance is a simple metaphor, connecting two disparate concepts, skies and paintings, as a way of expressing meaning. This metaphorical meaning is not that the sky is an actual painting, but rather that the sky looks beautiful and idyllic as though it were a piece of art such as a painting or something like this. Metaphors and other forms of figurative language can also express ideas beyond words, such as specific, pragmatic functions and speaker attitudes which provide a richer meaning that is useful for communication (Colston, 2015). Human complexity makes it likely that, to some extent, the human language experience is subjective with regards to the individual and the traits that make them who they are. Gibbs and Colston (2012) also explore personal characteristics as factors that influence figurative meaning like age, gender, occupation, culture, and personality, to name a few. Currently, there is some research looking into the impact shyness has on interpretations of irony (Mewhort-Buist & Nilsen, 2017; 2013) and the role of personality traits in metaphor production (Goetzman et al., 2007; McConnell & Bill, 1993). However, there is a gap in the research looking at how personality interacts with metaphor interpretation and how visual and verbal metaphors differ in interpretation. The present study aims to address these gaps in psycholinguistic research and add to the existing material surrounding both personality and figurative language and metaphor multimodality. Since metaphors and other forms of figurative

language also serve a social function, it makes sense that social personality traits such as introversion/extraversion may play a role in interpretation and production. Additionally, with the prevalence of visual communication made possible by computers (emojis, GIFs, etc.), it is important to understand individual language use and experience beyond the verbal modality.

In this study, I will focus on the personality trait of shyness (a.k.a., introversion, lack of extraversion) and the interpretation of visual and verbal metaphors. The goal of the study is to consider correlations between one's level of shyness and ratings on how familiar participants are with the metaphor (familiarity), how much they enjoy the metaphor (enjoyment), and how positive or negative they interpret the metaphor to be (polarity). I hypothesize that individuals with high shyness scores will interpret metaphors as more negative compared to individuals with low shyness scores due to the metaphor's non-linear, more ambiguous semantics. This hypothesis is because of the common comorbidity between shyness and a generalized social phobia (St Lorant et al., 2000), which is associated with more negative interpretations of ambiguous social events (Stopa & Clark, 2000). Additionally, I hypothesize that the portion of the task with the picture of a face present will yield more negative interpretations of metaphors in high-shy participants. This hypothesis is due to the face's ability to convey a sense of judgement (Bentham, 1995; Ernest-Jones et al., 2011) and the fear of negative evaluation present in shyness (St Lorant et al., 2000). The negativity associated with fear and judgement may feed into existing negative biases with ambiguous stimuli (Stopa & Clark, 2000). Lastly, I hypothesize that visual metaphors will have more extreme responses on emotion-related rating scales. This hypothesis is due to the "powerful impact" pictures have on readers due to their "holistic gestalt-like processing," which may lead to more emotional responses than linearly processed verbal metaphors (Yus, 2009).

In the next few paragraphs, I will discuss the background literature surrounding personality and figurative language production and interpretation, as well as visual metaphor comprehension and use. I will also go briefly into the pilot study conducted before the current study.

1.1 Shyness

Shyness is associated with the personality trait of introversion, which is also classified as a lack of extraversion. According to the American Psychological Association, shyness is defined as the "tendency to feel awkward, worried or tense during social encounters, especially with unfamiliar people" (*Shyness*, n.d.). Shyness is manifested by a hindrance to information processing skills, with children and adults performing worse on the STROOP test (Ludwig & Lazarus, 1983; Arnold & Cheek, 1986). In shy children, a high shy negative affect has been found to negatively impact their ability to understand others' emotions, intentions, and beliefs (Banerjee & Henderson, 2001). Additionally, shy individuals demonstrated a worse understanding of visual social cues when asked to interpret a series of video stimuli in the Interpersonal Perception Task (Shroeder, 1995). These findings demonstrate how shyness can influence and negatively impact information processing, likely due to preoccupation with anxiety and negativity that comes along with the personality trait.

1.1.1 Shyness, social phobia, and interpretation of events

A study looking into the comorbidities of shyness found that 97% of patients with chronic shyness also had a generalized social phobia, which makes sense as they both share

similar traits such as the fear of negative evaluation by others (St Lorant et al., 2000). With shyness being a personality trait that is very obviously tied to social situations and fears, it would make the most sense for research that examines the effect of shyness to be done in a social setting. Unfortunately, due to the COVID-19 pandemic, the current study was unable to utilize in-person delivery. However, research has shown that a picture of eyes alone can mimic the effects of another human being's presence. In one case, an image of eyes on a poster lessened the number of people littering by almost half (Ernest-Jones et al., 2011). What this example suggests is that an image of eyes alone can impose similar effects to actually being watched by another person. People then perform socially acceptable behaviours due to our 'panoptic self-control' (Bentham, 1995) when the image of the face is present, which stems from the fear of negative evaluation in social settings. When it comes to interpretation, social phobias have been tied to more negative interpretations of ambiguous and mildly negative social events demonstrating a negativity bias in socially anxious individuals (Stopa & Clark, 2000).

1.2 Figurative language and personality

Some theorists propose that five traits make up a human's personality. These 'big five' traits are extraversion, agreeableness, openness, conscientiousness, and neuroticism (McCrae & Costa, 2003). Metaphor research has additionally looked into the previously mentioned traits and other personality dimensions such as creativity (Barron, 1969; Glicksohn, Kraemer, & Yisraeli, 1993), cognitive flexibility (Fine & Lockwood, 1986), and optimism/pessimism (McConnell & Bill, 1993). Irony is also often explored alongside personality traits such as shyness (Mewhort-Buist & Nilsen, 2017; 2013). Research on sarcasm production and the 'big five' personality traits revealed that agreeableness negatively correlated with sarcasm production in general and that

agreeableness and conscientiousness negatively correlated with embarrassment-diffusion and face-saving sarcasm (Markowitz, 2007).

1.2.1 Metaphor production and personality

The majority of research regarding metaphor and personality has delved into personality's influence on metaphor production. Barron and his "symbolic equivalence test" asked participants to observe a stimulus image and then produce a metaphoric construction for said image. The metaphoric constructions were rated on the basis of originality and aptness. The scores were then examined in conjunction with the participants' professions, which revealed a ranking of creative professions with famous writers at the top (Barron, 1969). Metaphor use has also been positively correlated to cognitive flexibility (Fine & Lockwood, 1986). One study found that university students' level of optimism and pessimism was reflected and contained in the metaphors they produced regarding six different aspects of their lives (McConnell & Bill, 1993). Additionally, a study looking into the 'big five' personality traits and metaphor production of recent lung transplant recipients found a positive correlation where those with high extraversion levels produced more metaphor themes of acoustic, play/sport, and economic source domains. Additionally, individuals with high openness scores produced more metaphors with container, battle, and illness source domains (Goetzman et al., 2007). This research demonstrates an established connection between metaphors and personality, specifically in the realm of production.

1.2.2 Figurative language interpretation and shyness

Currently, research on figurative language interpretation and shyness is most prevalent regarding irony. A study looking into children's perception of counterfactual irony found that shy children interpreted the speakers of ironic criticisms as more negative and ironic compliments as more negative than those who were less shy (Mewhort-Buist & Nilsen, 2013). The same study on adults found that shier individuals interpreted speaker intent as more negative on ironic compliments (Mewhort-Buist & Nilsen, 2017). These studies demonstrate how shyness can have a negative influence on one's interpretation of figurative language regardless of age. They also show how the relationship between shyness and figurative language processing can change with age.

1.3 Visual metaphor modality

Advertisements and political cartoons meant to have a social impact commonly use metaphors in the visual modality to express ideas in a way that is attention-grabbing and appealing to the eye (Urios-Aparisi & Forceville, 2009). An example of a visual metaphor would be an image of a cone of cotton candy superimposed over the background of a sky to communicate that the clouds are light and fluffy like cotton candy. The understanding of the differences between visual and verbal metaphor interpretation is that the two are more similar than different. The difference lies in their decoding modules (visual: *the perceptual module*, verbal: *the language module*) alongside the implication of visual ambiguity in visual metaphors, which may make it hard for non-denotative meaning to be interpreted (Yus, 2009). Additionally, visual and verbal metaphors differ on quantity and quality of information, with visual metaphors having "a more powerful impact on the reader due to their holistic gestalt-like processing" (Yus,

2009) in opposition to linear verbal metaphors. Currently, there is not much literature demonstrating the similarities or differences between visual and verbal metaphors. However, based on this literature, visual metaphors may have a more significant emotional impact on people due to their more powerful nature.

1.3.1 Psychology and the visual modality

Research surrounding the visual modality and personality centers around psychological testing. The Thematic Apperception Test asks individuals to create stories based on ambiguous images as a means of exploring one's perceptions, apprehensions, and desires (Morgan & Murray, 1935). Rorschach or inkblot tests are also psychodiagnostic tools where ambiguous visual stimuli are presented to an individual who then, through projection, reveal elements of their psyche based on what they see (Rorschach, 1942). With these tests in mind, we can see that ambiguous visual stimuli have the capacity for varied interpretation depending on the interpreter's mental state. This idea means that the ambiguity of visual metaphors may play a similar role, where subjective cognitive characteristics may play more of a role in their interpretation.

1.4 Pilot study

In 2019 a pilot study was done with the same hypotheses, research goals, and metaphors as the current study. The task was similar; however, delivery was done in person through a pen and paper task. Additionally, the perceived sex of the observer (the Primary Investigator) was not looked into as only a female ran the task. In total, 20 undergraduate participants took part in the study. Analysis began by separating the participants into two groups based upon their score on

the McCroskey Shyness scale (McCroskey & Richmond, 1982). The high-shy group had shyness scores ranging from 44-55 and the low-shy group had scores ranging from 28-40. A two-factor ANOVA with replication was performed on each scale for familiarity, enjoyment, and polarity to examine any statistically significant relationships between the rating scales, metaphor modality, and shyness level. Then a series of two-tailed, two-sample equal variance t-tests were performed to compare the mean ratings of high-shy and low-shy groups regarding the variables of positive/negative metaphor type and solo/duo portions of the task.

1.4.1 Pilot study results

ANOVA's revealed a statistically significant finding between Shyness and the familiarity ratings ($p < 0.05$). High-shy individuals demonstrated higher familiarity ratings ($M = 4.82$) than low-shy individuals ($M = 4.39$). The ANOVA also found that verbal metaphors were rated as more familiar overall ($p < 0.05$, visual $M = 4.17$, verbal $M = 5.03$). No statistically significant results were found on the ANOVA's examining enjoyment and polarity. However, the enjoyment did demonstrate a marginal trend ($p = 0.069$), indicating that participants may have enjoyed verbal metaphors ($M = 4.73$) more than visual metaphors ($M = 4.50$), which may have been confirmed with a bigger N and more statistical power. T-tests between high-shy and low-shy groups indicated a statistically significant finding ($p < 0.05$) with shyness in regards to polarity. High levels of shyness negatively correlated with polarity ratings for negative metaphors regardless of metaphor modality (high-shy $M = 2.4$, low-shy $M = 2.74$). There was no significant finding around the presence or absence of the observer during the metaphor interpretation task.

Results do show that shyness influenced metaphor interpretation, specifically regarding negative metaphors. Both the hypothesis that the presence of the observer would lead to more

negative interpretations of metaphors in shy people and the hypothesis that visual metaphors would have more extreme emotional ratings were not supported. The low *N* of this research does not allow for solid conclusions. Thus, the hypotheses in the current study were not altered to suit the results of the pilot study. What this information does support is the existence of a relationship between shyness and metaphor interpretation.

1.5 Research question

From the literature review, we can see that research does demonstrate a connection between personality and figurative language interpretation and production. However, there is a gap in research looking into visual and verbal metaphor interpretation and personality traits such as shyness. If shyness has a negative effect on information processing (Arnold & Cheek, 1986: Banerjee & Henderson, 2001; Ludwig & Lazarus, 1983; Shroeder, 1995) and is associated with negative biases with ambiguous social stimuli (Stopa & Clark, 2000), then we would expect to see that shier individuals have a negative bias in their interpretation of ambiguous language such as metaphors. Another form of figurative language, counterfactual irony, has demonstrated this negative bias in interpretation (Mewhort-Buist & Nilsen, 2017; 2013). This finding with counterfactual irony furthers the expectation that high-shy individuals will have more negative interpretations of metaphors, as both forms of figurative language similarly convey social meaning through figurative construction (Colston, 2015). Additionally, if social phobias are a prominent comorbidity with chronic shyness (St Lorant et al., 2000), then we would expect an image that mimics social observance (Bentham, 1995; Ernest-Jones et al., 2011) to manifest negative emotions in high-shy individuals. With an already existing negativity bias towards ambiguous and mildly negative social situations (Stopa & Clark, 2000), we would expect that an

increase in negative emotions such as fear would contribute to more negative metaphor interpretations. Furthermore, if the processing of visual metaphors has a more powerful impact on the participants (Yus, 2009), then we would expect to see more emotional responses to their content. In this study, I will explore the influence of shyness on one's interpretation of visual and verbal metaphors and whether or not metaphor modality demonstrates differing or similar results in said interpretation.

CHAPTER 2. METHODS

Online delivery was chosen for the study to ensure the Primary Investigator and participants' safety during the COVID-19 pandemic. This delivery allowed for the participants to complete the study in their own homes. A survey format was chosen as it is optimal for direct elicitation and quantitative analysis of metaphor interpretations (Schilling, 2013). The shyness scale portion of the survey was always administered last to reduce the participants' self-consciousness about shyness during their completion of the metaphor interpretation task.

2.1 Participants

Approval for the study was granted by the University of Alberta Research Ethics Board, prior to the recruitment of participants. Participants enrolled in the study through the University of Alberta Department of Linguistics, Linguistics SONA Sign-Up System. All participants were students from the University of Alberta registered in an introductory linguistics course. Participants were compensated for their participation in credits, which went towards their grade points in said introductory linguistics course. Participants were limited to native English speakers to avoid any confounding variables regarding comprehension of the material.

In total, 79 participants, consisting of 40 females and 39 males took place in the study. However, the data of only 64 of those participants, 32 female and 32 male, were included in the analysis due to two instances of improper completion of the task and insurance of proper counterbalancing. With the exception of those participants who did not fulfill the study's requirements, the Primary investigator chose those participants to be excluded from the study at random. The ages of the 64 participants ranged from 17 to 50 years old, with a mean age of 20.

2.2 Materials and procedures:

Participants were asked to fill out an online Google Forms survey. There were eight different versions of the survey (Table 2.1) to counterbalance variables across participants. In the Linguistics SONA Sign-Up System, there were sixteen different versions of the study, eight versions restricted to females and males, respectively. This action was to ensured equal distribution of the binary sexes across all eight versions of the survey

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Version	Visual Metaphor Numbers	Verbal Metaphor Numbers	Sub-Task	Sex of Face
1	Odd	Even	A-B	Female
2	Odd	Even	A-B	Male
3	Odd	Even	B-A	Female
4	Odd	Even	B-A	Male
5	Even	Odd	A-B	Female
6	Even	Odd	A-B	Male
7	Even	Odd	B-A	Female
8	Even	Odd	B-A	Male

Table 2.1: The survey versions and their variables.

Participants had to be signed in to their University of Alberta email account to access the online survey they signed up for through the Linguistics SONA Sign-Up System. The participants' email was automatically collected by the Google Forms survey. Collecting the emails was necessary in order to grant the participants with their credits and to send additional copies of consent and debriefing forms for participants to keep. After completing these actions, the Primary Investigator deleted each participant's email to guarantee the data's anonymity.

Each survey began with a letter of consent informing the participants of their rights regarding the study. After reading the letter through, the participants had to imply consent by checking off "Yes" in response to the statement "I consent to participate in this study." Participants were also sent a copy of the consent form to keep on file via email after completing the study.

Next, participants were asked to fill out a general information section that gathered their age, sex, major and minor, and fluency or learning of any additional languages. Participants were then provided with instructions and examples and asked to complete a metaphor interpretation task. After interpreting all 24 metaphors, participants were provided with more instructions and were asked to complete the shyness scale task.. Each survey displayed a debriefing form at the end, providing the participants with more information regarding the study's purpose. Participants also were sent a copy of this debriefing form to keep on file following their completion of the study.

2.3 Design:

Delivery of the study was online through links to multiple Google Forms surveys. Each link led to a different version of the study to counterbalance variables. The study consists of a 2x4 within-subject and a 2x2 between-subject design displayed by Table 2.2 and Table 2.3, respectively.

Metaphor type	Occurrence of observatory face	
	Face Present	**Face Absent**
Positive visual	Positive Visual, Face Present	Positive Visual, Face Absent
Negative visual	Negative Visual, Face Present	Negative Visual, Face Absent
Positive verbal	Positive Verbal, Face Present	Positive Verbal, Face Absent
Negative verbal	Negative Verbal, Face Present	Negative Verbal, Face Absent

Table 2.2: Within-subject variables for the study.

Sex of Participant	Sex of Observing Face	
	Female	**Male**
Female	Female, Female	Female, Male
Male	Male, Female	Male, Male

Table 2.3: Between subject variables for the study.

2.4 Metaphor interpretation task:

This task consisted of two parts sub-task A and sub-task B. The order of occurrence for these sub-tasks alternated across versions of the survey to counterbalance and account for any order effects. Between the two tasks, participants had viewed a collection of twenty-four alternating visual and verbal metaphors each. The collection of visual metaphors consisted predominantly of images from http://www.vismet.org/VisMet/display.php and Google Images. Additionally, the Primary Investigator created two images used in the metaphor collection, seen in Figure 1. On four out of the eight versions of the survey, all odd-numbered metaphors are visual, and on the other four versions, all even-numbered metaphors are visual. The verbal

metaphors were direct translations of the visual metaphors and are in a simple X is Y format (ex. In Figure 1: "The ballerina" is the X and "a swan" is the Y). Thus, all participants received the same metaphors. However, the modality of each metaphor was either visual or verbal, depending on the version of the survey. For example, if the two images under the "Visual" column in Figure 2.1 were Metaphor 1 and Metaphor 2 in versions 1 through 4, then the two metaphors under the "Verbal" column were Metaphor 1 and Metaphor 2 in versions 5 through 8.

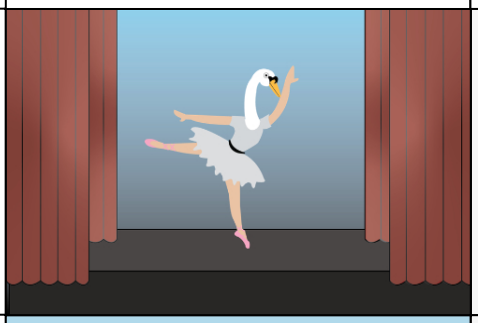
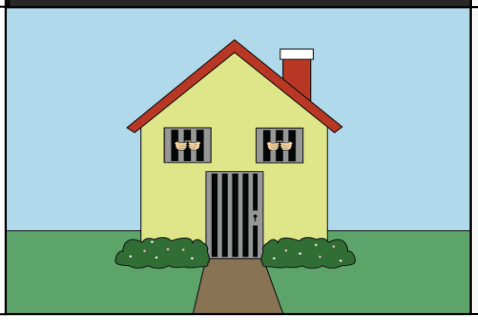
	Visual	Verbal
1		The ballerina is a swan.
2		The house is a prison.

Figure 2.1: Visual and verbal metaphor examples from the task.

Both sub-task A and sub-task B displayed each metaphor individually. Participants were asked to interpret the metaphor by answering the following questions and statements:

1. Is this metaphor visual or verbal?
2. If this is a visual metaphor, translate it into a verbal format with the structure X is/are Y.
3. Paraphrase and/or describe what you believe the metaphor means.

4. How familiar are you with this metaphor? (Likert scale rating: "Not at all familiar" = 1 to "Very familiar" = 7)
5. Did you enjoy this metaphor? (Likert scale rating: "No enjoyment at all" = 1 to "Really enjoyed" = 7)
6. How positive or negative did you find this metaphor? (Likert scale rating: “Very negative” = 1 to “Very positive” = 7)

2.4.1 Sub-task A

In this sub-task, the participants were asked to interpret 12 of the 24 visual and verbal metaphors with a face present to mimic the existence of an observer (Bentham, 1995; Ernest-Jones et al., 2011). Next to each of these metaphors, the participant would see either a female[1] or male[2] (Figure 2.2) computer-generated face from www.generated.photos.com. All participants who had the female face saw the same face and all of the participants who saw the male face saw the same face. Participants were asked to exclude the image of the face in their interpretation of the metaphor.

2.4.2 Sub-task B

In this sub-task, the participants interpreted 12 of the 24 metaphors without any face present. The space where the face would be in sub-task A is left as empty white space.

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[1] https://generated.photos/face/neutral-white-young-adult-female-with-long-brown-hair-and-brown-eyes--5e6882856d3b380006f0a84d

[2] https://generated.photos/face/neutral-white-young-adult-male-with-short-brown-hair-and-brown-eyes--5e6887736d3b380006f1c857

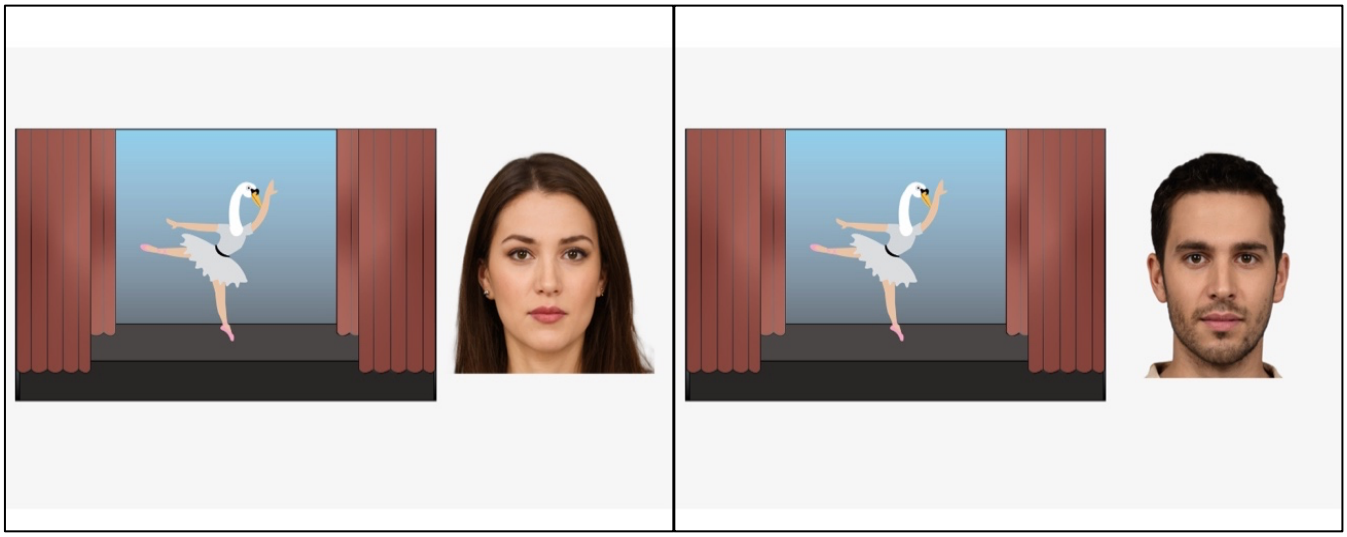

Figure 2.2: Example metaphors with female and male face.

2.5 Shyness scale Task:

Following the completion of the metaphor interpretation task, participants were presented with a series of 14 statements from the McCroskey Shyness Scale (McCroskey & Richmond, 1982). Some examples of these statements are "Other people think I am shy," "I am a very talkative person," and "Most people talk more than I do." The participants were to rate each statement on a five-point scale ("Strongly Disagree =1" to "Strongly Agree =5") based on how much it applied to them.

CHAPTER 3. RESULTS

Data analysis was performed through a series of two-tailed correlations as well as both two-tailed paired and two-tailed two-sample t-tests in Microsoft Excel.

3.1 Shyness scale

The calculation of shyness scores followed the instructions of the McCroskey Shyness Scale (McCroskey & Richmond, 1982). Scores ranged from 20 to 67, with a mean of 44.47, median of 45.50, and a standard deviation of 12.69. According to the McCroskey Shyness Scale, scores less than 32 suggest a low level of shyness and scores greater than 52 suggest a high level of shyness. For the purpose of the present study, those with shyness scores between 20 and 45 indicated low levels of shyness, and those between 46 and 67 indicated high levels of shyness. This revised division ensured an equal sample size in both groups. A two-tailed, two-sample T-test revealed that across all participants, females demonstrated a significantly ($p < 0.5$) higher mean shyness score ($M = 46.91$) than males ($M = 42.03$). Age did not significantly correlate with shyness rating.

3.2 Metaphor interpretation task

All metaphor interpretations were analyzed to measure for correctness. Each metaphor had multiple correct interpretations. The interpretation would be marked as correct so long as the participant both identified the correct variables being compared in the metaphor and a made sense of a reasonable relationship between them. For example, if a visual metaphor demonstrated a cone of cotton candy in the sky, both "The clouds are cotton candy" and "The cotton candy is a

cloud" were taken as correct verbal translations; As long as the participant was able to paraphrase that the clouds looked like cotton candy or vice versa, the interpretation was labeled as correct. Figure 3.1 demonstrates the breakdown of responses in regards to the accuracy of metaphor interpretations. Overall, 90% of the interpretations were correct, and visual metaphor interpretations made up 90% of incorrect and absent interpretations such as "I don't know."

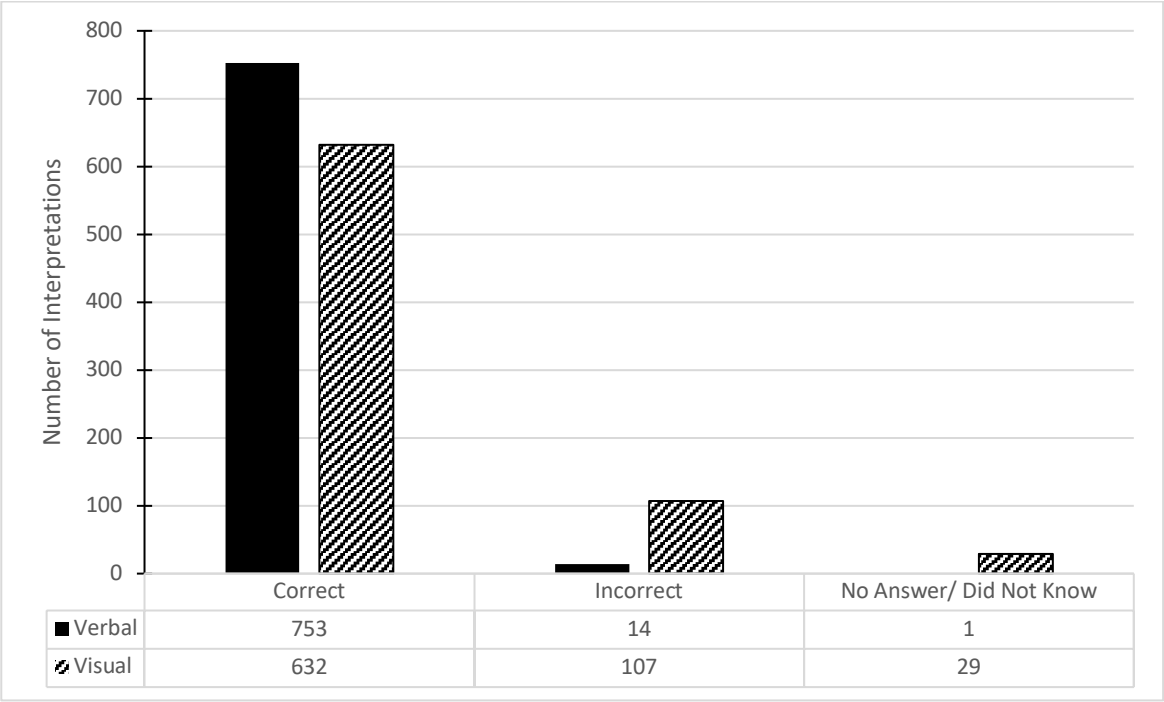

Figure 3.1: Accuracy of metaphor interpretations.

3.2.1 Analysis of within-subject variables

Average Likert scale ratings on a scale of 1 (Not At All Familiar, No Enjoyment At All, Very Negative) to 7 (Very Familiar, Really Enjoyed, Very Positive) for familiarity (M = 4.400), enjoyment (M = 4.140), and polarity (M = 4.020) were all around the center of the scales. A series of two-tailed correlational analyses were used to examine the relationships among the variables. With this analysis, the correlation coefficient had to be greater than 0.2464 to be

significant at the 0.05 level (*df* = 62). Table 3.1 shows that the only significant correlations were positive correlations between familiarity and enjoyment ratings and between enjoyment and polarity ratings. Tables 3.1 and 3.2 demonstrate no significant correlation between any of the variables with shyness level.

	Familiarity	Enjoyment	Polarity	Shyness	Age
Familiarity	-	0.4553*	0.1181	0.02648	-0.02270
Enjoyment	-	-	0.5063*	0.001656	0.03320
Polarity	-	-	-	-0.02406	0.07169
Shyness	-	-	-	-	-0.1395
Age	-	-	-	-	-

Table 3.1: Correlations between study variables.
*Indicates significance at the 0.05 level.

The data set underwent an additional correlational analysis looking into the relationship between variables depending on metaphor type. This analysis also required a correlation coefficient greater than 0.2464 to be significant at a 0.05 level (*df* = 62). Table 3.2 exhibits that the positive correlations between familiarity and enjoyment ratings and enjoyment and polarity ratings exist across all metaphor types. Additionally, positive metaphors in both visual and verbal modalities demonstrated a positive correlation between familiarity and polarity.

	Familiarity	Enjoyment	Polarity	Shyness
		Verbal Negative		
Familiarity	-	0.4527*	0.1283	0.01520
Enjoyment	-	-	0.4122*	0.05114
Polarity	-	-	-	0.03251
Shyness	-	-	-	-
		Verbal Positive		
Familiarity	-	0.4838*	0.4344*	0.003492
Enjoyment	-	-	0.5685*	-0.01564
Polarity	-	-	-	-0.06053
Shyness	-	-	-	-
		Visual Negative		
Familiarity	-	0.3908*	0.009563	0.009733
Enjoyment	-	-	0.4000*	-0.02659
Polarity	-	-	-	-0.06095
Shyness	-	-	-	-
		Visual Positive		
Familiarity	-	0.6043*	0.4371*	0.07708
Enjoyment	-	-	0.6006*	-0.0003984
Polarity	-	-	-	-0.03688
Shyness	-	-	-	-

Table 3.2: Correlations between ratings and shyness scores in different metaphor types.
*Indicates significance at the 0.05 level.

A two-tailed paired t-test demonstrated a significant ($p < 0.05$) finding where negative metaphors had higher familiarity ratings ($M = 4.663$) than positive metaphors ($M = 4.133$). The same type of t-test with enjoyment and polarity ratings found a significant ($p < 0.05$) difference in means, with positive metaphors having higher means (enjoyment $M = 4.518$, polarity $M = 5.292$) than negative metaphors (enjoyment $M = 3.754$, polarity $M = 2.749$).

Two-tailed, paired t-tests were used to examine the difference between visual and verbal metaphor ratings. A significant difference ($p < 0.5$) was found between average ratings on all rating scales, with verbal metaphors having a greater average in familiarity (visual $M = 3.988$, verbal $M = 4.087$), enjoyment (visual $M = 3.975$, verbal $M = 4.297$), and polarity (visual $M = 3.945$, verbal $M = 4.095$). This finding was consistent across positive metaphors. However, negative metaphors only demonstrated a significant difference ($p < 0.05$) in means between visual and verbal metaphors regarding familiarity ratings, with verbal metaphors having a higher average (visual $M = 4.286$, verbal $M = 5.039$). Positive verbal metaphors had significantly ($p < 0.05$) higher averages on all three rating scales (familiarity $M = 4.576$, enjoyment $M = 4.742$, polarity $M = 5.523$) than positive visual metaphors (familiarity $M = 3.690$, enjoyment $M = 4.294$, polarity $M = 5.060$). Negative verbal metaphors demonstrated a significantly ($p < 0.05$) higher familiarity rating ($M = 5.040$) than negative visual metaphors ($M = 4.286$). Additionally, there was a marginally significant ($p = 0.07858$) finding where negative verbal metaphors had lower polarity ratings ($M = 2.667$) than negative visual metaphors ($M = 2.831$). There was no statistically significant finding with enjoyment ratings between negative visual and negative verbal metaphors.

Two-tailed, paired t-tests were performed to examine the effect of the presence or absence of the face alongside the metaphors. No significant difference ($p < 0.05$) was found.

However, the difference between average enjoyment ratings was close to significant (p = 0.06290), in which sub-task B (no face present) had a higher average (M = 4.224) than sub-task A (M = 4.048).

3.2.2 Analysis of between-subject variables

Two-tailed, two-sample t-tests were also performed comparing ratings between the low-shy and high-shy groups. No significant difference ($p < 0.05$) between averages was found. However, a marginal finding (p = 0.07613) demonstrated that high-shy individuals rated negative metaphors lower on the polarity scale (M = 2.648) than low-shy individuals (M = 2.849). Another marginal finding (p = 0.05800) demonstrated that high-shy individuals had higher ratings of familiarity (M = 4.526) in sub-task A (with the observing face) than low-shy individuals (M = 4.221).

Two-tailed, two-sample t-tests were performed to compare the means of ratings between female and male participants. A significant difference ($p < 0.05$) was found, demonstrating that females had higher ratings of enjoyment (female M = 4.310, male M = 3.962) and polarity (female M = 4.138, male M = 3.902) across metaphors. Additional t-tests found that this finding of females demonstrating higher enjoyment and polarity ratings was significant with verbal and not visual metaphors, as seen in figure 3.2. Additionally, figure 3.2 demonstrates that the average rating for familiarity regarding visual metaphors amongst males was significantly greater than females. A significant difference was found in familiarity ratings of negative metaphors, in which males demonstrated a higher average rating. Positive metaphors demonstrated additional statistically significant findings, with females having higher enjoyment (female M = 4.812, male M = 4.223) and polarity ratings (female M = 5.466, male M = 5.117).

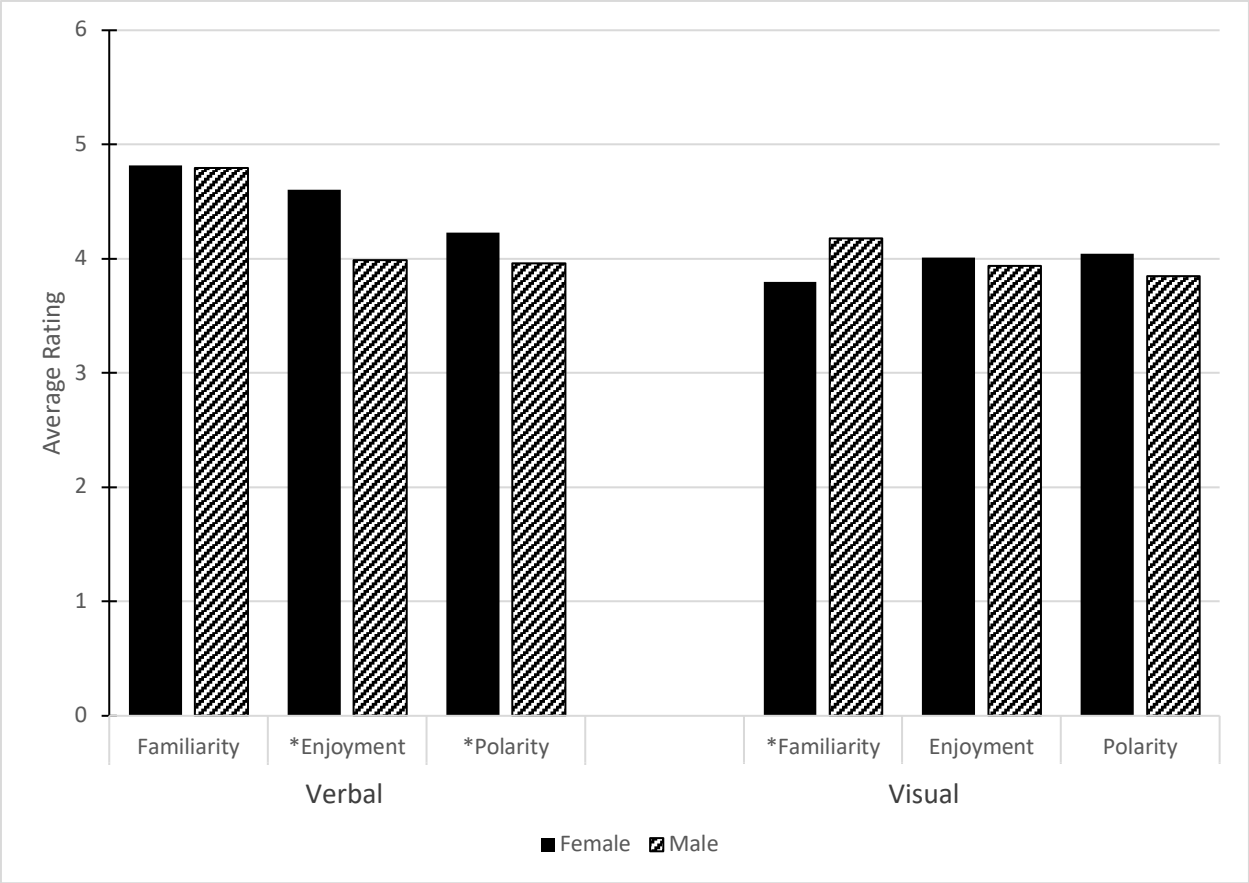

Figure 3.2: Mean ratings for visual and verbal metaphors between sexes.
*Indicates significance at the 0.05 level.

Two-tailed, two-sample t-tests were performed to compare the means of ratings between the presence of the female and male face in sub-task A. The only significant finding ($p < 0.05$) between the female and male faces was that the presence of the female face had a higher mean for enjoyment ($M = 4.227$) than the male face ($M = 3.870$).

Two-tailed, two-sample tests also examined the relationship between the sex of the face and the sex of the participant. No statistically significant differences ($p < 0.05$) between faces were found with the female participants. However, in male participants, a significant difference was found in enjoyment ratings; Males demonstrated higher average enjoyment ratings with the female face ($M = 4.063$) than with the male face ($M = 3.615$).

CHAPTER 4. DISCUSSION

The study examined whether or not one's level of shyness influenced one's interpretations of visual and verbal metaphors. The main hypotheses were:

1. That individuals with high shyness scores will interpret metaphors as more negative compared to individuals with low shyness scores due to the metaphor's non-linear, more ambiguous meaning. This hypothesis is because of the high co-occurrence of shyness with a generalized social phobia (St Lorant et al., 2000), which is associated with more negative interpretations of ambiguous social events (Stopa & Clark, 2000).
2. That the portion of the task with the picture of a face present will yield more negative interpretations of metaphors in high-shy participants. This hypothesis is due to the face's ability to convey a sense of judgement (Bentham, 1995; Ernest-Jones et al., 2011) and the fear of negative evaluation present in shyness (St Lorant et al., 2000). The negativity associated with fear and judgement may feed into existing negative biases with ambiguous stimuli (Stopa & Clark, 2000)
3. That visual metaphors will have more extreme responses on emotion-related rating scales. This hypothesis is due to the "powerful impact" pictures have on readers due to their "holistic gestalt-like processing," which may lead to more emotional responses than linearly processed verbal metaphors (Yus, 2009).

Although none of these hypotheses were confirmed based on the present data, the study did yield other findings. Results from the rating scales demonstrated a positive correlation between familiarity and enjoyment. This correlation can most likely be interpreted on the basis of the 'Mere Exposure Effect' (Zajonc, 1968). Essentially, the metaphors with which participants

were more familiar were viewed as more positive due to the participants' assumed previous exposure to them. Participants simply liked what was more familiar to them. A second positive correlation was found between enjoyment and polarity. This relationship is likely due to participants finding positive stimuli more pleasurable than negative stimuli since pleasant things tend to be more enjoyable than unpleasant things. Another explanation for this correlation could be that the participants found stimuli that they enjoyed to be more positive and stimuli that they did not enjoy to be more negative. The participants' pleasurable or unpleasurable experience with the metaphor resulted in a 'positivity bias' or 'negativity bias' towards their polarity rating. It could also be likely that both explanations account for the correlation as they are mutually compatible. Regardless, in general, people tend to enjoy positive and dislike negative experiences.

Where things become less clear is the correlation between familiarity and polarity regarding positive metaphors in both modalities. The finding could be demonstrating the 'Pollyanna Principle' (Matlin & Stang, 1978), where positive memories are more accurate than negative ones. It could be that metaphors that the participants find more positive end up being more familiar because the participants have a subconscious bias to remember the positive experience with the metaphor with more accuracy. Another explanation could be that there is some sort of doubling effect where familiarity results in more positive interpretations of stimuli (Zajonc, 1968) and feeds into the metaphor's positive valence. Essentially, the participant's familiarity influenced their enjoyment of positive metaphors, which influenced the interpretations of positive metaphors to be even more positive than if the participants were not familiar with them. These ideas are admittedly just speculation at present, and more research

regarding this finding would have to be done to provide a more concrete answer. But these are at least some contender explanations.

However, another interesting finding to note is that overall, negative metaphors had higher familiarity ratings. Negative metaphors demonstrating a higher rating of familiarity can be interpreted through a 'negativity bias' where negative stimuli have a more substantial emotional impact on the participant than positive stimuli. This deeper emotional impact makes more of an imprint on the memory. Thus, negative stimuli are remembered with more accuracy than positive stimuli (Kensinger, 2007; Liebrecht et al., 2019). This finding would contradict the 'Pollyanna Principle' explanation for the correlation between familiarity and polarity with positive metaphors. However, a basis for the 'Pollyanna Principle' is that it operates at a subconscious level, while the negativity bias can operate at more on a conscious level (Kaur & Chadha, 2016). It could be that the 'Pollyanna Principle' is having a subconscious effect on participants with positive metaphors only, but the conscious effect of the 'negativity bias' was more profound, and therefore negative metaphors had higher familiarity ratings overall.

One pronounced finding was the preference for verbal metaphors over visual metaphors. Verbal metaphors had a greater percent correct (98%) than verbal metaphors (82%) in metaphor identification. Visual metaphors accounted for 90% of interpretation errors. There is potentially more ambiguity in visual metaphors where a denotative or metaphoric interpretation is relevant. People may have a different interpretation of referents based on their own experiences and what is relevant to them (Yus, 2009). Essentially this ambiguity leaves room for a wide variety of interpretations on visual metaphors, which may or may not be logical to everybody due to the subjective nature of some concepts. Some people may not find any metaphorical meaning and

interpret the image as a literal representation. Verbal metaphors are relatively linear; therefore, they are not as susceptible to ambiguity in their interpretations compared to images (Yus, 2009).

Verbal metaphors also had higher ratings on all three rating scales (familiarity, enjoyment, and polarity), indicating a strong preference for the verbal modality. Familiarity ratings were likely higher for verbal metaphors due to that being the traditional metaphor domain. With positive metaphors, the verbal modality had higher enjoyment and polarity ratings. For negative metaphors, the polarity scores were marginally lower with verbal metaphors. Enjoyment ratings for negative metaphors did not have a statistically significant difference between modalities.

These findings do not support the initial hypothesis that visual metaphors would have more extreme responses on emotional rating scales. Instead, the results suggest that verbal metaphors had more extreme emotional responses. A possible explanation for the overall preference of verbal metaphors and their higher and marginally lower polarity ratings for positive and negative metaphors, respectively, is the 'Optimal Innovation Hypothesis' (Giora et al., 2004). This hypothesis suggests that the most pleasurable stimuli are at an 'optimal' balance between 'familiar' and 'novel.' Essentially, visual metaphors may not have been optimally innovative due to their lower ratings of familiarity and assumed greater amount of novelty. Verbal metaphors, however, may have had more of a balance between familiarity and novelty, making them more pleasurable to the participants.

Interestingly, negative metaphors demonstrated less of a difference in enjoyment and polarity ratings between both modalities. It could be that even though the verbal metaphors were more optimally innovative, their negative emotional valence overpowered any pleasurable effect. Thus, resulting in ratings that were more similar to less optimally innovative visual metaphors.

Negative metaphors were also more familiar overall, so it could be that their high levels of familiarity and assumed low levels of novelty made them less optimally innovative than positive metaphors.

Females had significantly higher shyness scores than males, which supports previous research suggesting that shyness (or a lower level of extraversion) is more prevalent in females (Else-Quest et al., 2006; Lynn & Martin, 1997; Smith et al., 2012).

The female face had higher ratings of enjoyment than the male face overall. This finding may be due to males demonstrating higher enjoyment ratings with the female observing face present than they did with the male face. Female participants did not indicate a preference between the presence of the female and male observing face, so it is possible that the male participants account for most of the high enjoyment rating with the female face. It could also be that the female faced was more 'average' than the male face. Digitally averaged faces have been found to be more attractive than extreme male or extreme female faces (Langlois & Roggman, 1990).

Male participants also exhibited lower levels of enjoyment with the male face than the female participants did. The explanation for these findings is likely due to the basic principle of human attraction. Assuming the majority of the men who participated in the study are heterosexual, it makes sense that they enjoy looking at a female face more than a male, given this is what is more attractive to them. Male participants may have even had an adverse reaction to the male face due to their lack of attraction. As to why females did not show a preference for the female or male face, this might be explained by research suggesting that males prioritize physical appearance over other traits. Females still value appearance, but they also highly value other characteristics such as social status and income (Harrison & Saeed, 1977; Wiederman, 1993).

One study has demonstrated that females are more susceptible to moral factors than men when determining their attraction to artificial face models (González-Álvarez & Cervera-Crespo, 2019).

Between female and male participants, males demonstrated higher ratings of familiarity with visual metaphors and negative metaphors than females did. Additionally, females showed higher ratings of enjoyment and polarity with verbal metaphors and positive metaphors than males did. After reviewing literature regarding the sexes and metaphor, I failed to locate an explanation for this finding. More research is necessary even to speculate as to why there is a difference between males and females in metaphor interpretation.

4.1 Marginal findings

Before I begin the discussion in this section, I want to make clear that these are marginal results. I am not claiming that these findings are significant because they are not. However, these findings are important to mention as they trend towards becoming significant. Therefore more research could be done to look into these findings before determining whether they demonstrate an effect. For all of these marginal findings, a change from online to in-person delivery of the study and more power may increase the likelihood of being statistically significant.

A marginal finding demonstrated a preference for sub-task B (without the observing face present) through higher enjoyment ratings. Individuals in the low-shy group also exhibited marginally higher ratings of enjoyment for sub-task B than sub-task-A. This finding makes sense as people tend to exhibit 'panoptic self-control,' which influences human behavior towards what is acceptable when judgment is possible through the presence of an observer (Bentham, 1995). It could be that the face presents the participant with the feeling that they could be judged, which places pressure upon them. This capability of judgement and pressure is likely not interpreted

positively by the participant, so they demonstrate a preference for the solo task. It could also be that those with lower levels of shyness (which can also be seen as higher levels of extraversion) may have seen the face as more unsettling as they have more of a desire for social interaction and conversation. A still face is unable to provide that, and some high-shy individuals may have taken solace in that as they have less of a desire for interaction.

Another marginal finding demonstrated that individuals from the high-shy group interpreted negative metaphors as more negative. The pilot study found this same result, but in that case it was significant, which reflects the possibility that the current study's delivery could have been a factor. An explanation for this marginal result could be that individuals with high shyness levels have a negative bias towards their interpretation of negative stimuli. This finding is consistent with previous studies demonstrating that shy individuals have more negative interpretations of negative or mildly negative stimuli (Mewhort-Buist & Nilsen, 2017; Mewhort-Buist & Nilsen, 2013; Stopa & Clark, 2000).

Lastly, a marginal finding indicated that individuals in the high-shy group demonstrated higher familiarity levels in sub-task A (when the observant face is present). A possible reason for this finding could be rooted in the tendency for those with chronic shyness to have the symptoms of a social phobia (St Lorant et al., 2000). When presented with a scenario in which they could be judged, such as with the observing face, they may opt to represent themselves as more familiar with these metaphors to avoid the risk of negative judgment regarding their level of knowledge. This phenomenon is known as 'certainty posing' (Van Zant, 2015), where individuals overstate their knowledge on a topic as means of attempting social gain.

CHAPTER 5. CONCLUSION

Based on the results gathered, it does not appear that shyness has a significant effect on visual and verbal metaphor interpretation. Additionally, verbal metaphors seemed to be better received by participants than visual metaphors did. Although the two modalities did demonstrate some difference in reception, they both exhibited the same correlations between rating scales indicating that they have some similarities in interpretation. Further research into the metaphor modalities and how other personality traits and sex may affect metaphor interpretation would be beneficial to the field of figurative language study. Additionally, further research into metaphors and the effects of socially impeding traits (shyness) and phobias is worth exploring as metaphors have a social bonding potential that may be impacted. It is essential to continue examining how an individual's subjective traits influence their language experience as it provides insight into future psycholinguistic frameworks.

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APPENDIX A: Verbal metaphors

A1: Positive metaphors

1. The clouds are cotton candy.
2. The dog is an angel.
3. The stars are diamonds.
4. Their heart is gold.
5. The mind is an escape.
6. The moon is a siler dollar.
7. The elephants' trunks are tubas.
8. Their mind is a filing cabinet.
9. Book pages are freedom.
10. The night is a warm blanket.
11. The ballerina is a swan.
12. The ocean is a sheet of blue.

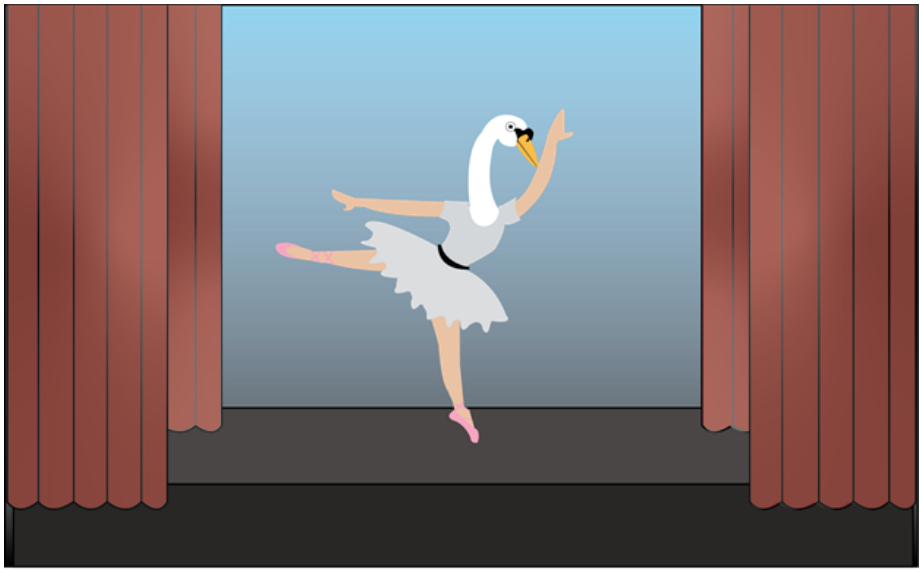
A2: Negative metaphors

1. War is a game.
2. Their hand is ice.
3. They are a sloth.
4. Time is money.
5. The speech was sewage.
6. They are a pig.
7. People are sardines.
8. The world is a sinking ship.
9. Cellphones are slave masters.
10. The house is a prison.
11. Smoking is a trap.
12. The brain is a turtle.

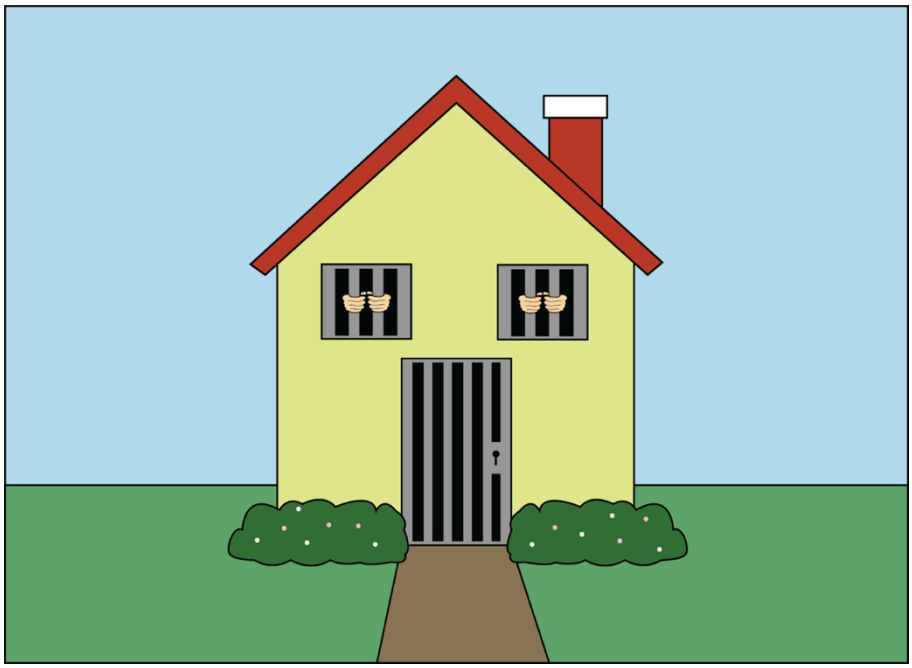
APPENDIX B: Visual metaphors

Most visual metaphors were collected from www.vismet.com and Google images, so they will not be included in this paper to avoid any issues with copyright and licensing. Two of the visual metaphors included in the task were created by the Principle Investigator, which are included below.

Positive



Negative



APPENDIX C: Observant faces

These faces were collected from www.generated.photos.com.

Female

https://generated.photos/face/neutral-white-young-adult-female-with-long-brown-hair-and-brown-eyes--5e6882856d3b380006f0a84d

Male

https://generated.photos/face/neutral-white-young-adult-male-with-short-brown-hair-and-brown-eyes--5e6887736d3b380006f1c857