Spring 5-8-2024

Trust Judgements of Facial Stimuli

Linsey Culkins
linsey.culkins@go.mnstate.edu

Trust Judgements of Facial Stimuli

A Thesis Presented to
The Graduate Faculty of
Minnesota State University Moorhead

By

Linsey Dawn Culkins

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in
Clinical Mental Health Counseling

May 8, 2024

Moorhead, Minnesota

Abstract

Professional counselors and clients who meet in healthcare facilities may be required to wear masks if COVID community transmission levels are high ([CDC], 2022). The current 4-part study examines how masking may affect therapeutic alliances via judgements of trust formed during first impressions. A 2(trustworthiness) x 5(facial feature visibility) within-subjects factorial design was used to assess one implicit measure of pleasantness using an Affect Misattribution Procedure as well as explicit facial judgements of valence, dominance, and trustworthiness (Payne & Lundberg, 2014). Using E-prime, undergraduate psychology students responded to faces previously rated as high or low in trustworthiness in all parts (Ma et al., 2015). Both the direction and the speed of all judgements were recorded. It was predicted that implicit and explicit evaluations of masked and occluded low-trust target images would be more positive and slower than explicit evaluations of fully visible low-trust images (Oliveira & Garcia-Marques, 2022). While main effects for trustworthiness were found in ratings from every part, main effects of visibility were not. Interactions were found between trustworthiness and visibility, but primarily among ratings of the high-trust targets. In general, ratings were highest when all features of target faces were fully visible and lowest when only the bottom half of the faces were visible. Possible clinical implications of masking on first impressions are discussed.

Keywords: Trust, Mask, Facial Features, First Impressions

Table of Contents

CHAPTER ONE: INTRODUCTION

The COVID-19 pandemic forever changed health care and social expectations in many ways. Though wide-spread use of face coverings has not continued, the Centers for Disease Control and Prevention ([CDC], 2022) has indicated that use of face coverings can be recommended in health care facilities located where community transmission levels warrant continued caution. For mental health clinicians who operate in hospitals or clinics in regions with high transmission levels, this means that care will be provided while masked. As such, both client and clinicians will both be expected to wear a surgical face mask covering the nose and mouth while meeting in-person.

While masks are a necessary intervention in clinical settings used to prevent disease, establishing a sense of trust with patients or clients is at the heart of both counseling and many other healthcare professions (Fletcher-Tomenius & Vossler, 2009; LoCurto & Berg, 2016). Trust is an important factor in establishing client-clinician relationships, in maintaining therapeutic alliances over time, and even client treatment outcomes (Brennan et al, 2013; LoCurto & Berg, 2016). A rigorous scientific understanding of what underpins social trust judgements will benefit clinicians who are interested in employing best practices to secure a therapeutic alliance and maintain it with their clients, even while masked.

Statement of the Problem

Trust is so ubiquitous that it is easily taken for granted. While trust is a subjective individual social experience, the cognitive factors that influence perception of trust are not completely understood. If masking is a factor that impedes trust development, a scientific study of the cognitive factors affecting trust could affect recommendations for clinical practice.

Purpose of the Study

The goal of the present research is to investigate if face coverings affect social judgements due to valence evaluation, dominance evaluation, or both. Additionally, the present research aims to uncover differences in information processing and social judgements when features of a face are obstructed from view. Are face coverings—which obstruct features typically scanned for facial recognition tasks—enough of a stimulus-driven factor to affect implicit and/or explicit judgements of trust?

This inquiry is not intended to diminish the important protective factors that employing a surgical face mask provides, especially when community communicable disease transmission is high. It is intended to shed light on how this necessary intervention may affect social behaviors now and in the future, both in a clinical setting and beyond.

Definition of Terms

Consensual judgments: A component of an individual raw score that aligns with average ratings (Jaeger, 2021).

Dominance: A dimension upon which facial stimuli have been known to be evaluated. Judgements of dominance fall along a continuum reflecting estimated ability or likeliness to cause harm or threat (Olszanowski, Kaminska & Winkielman, 2018; Oosterhof & Todorov, 2008). A perception of high dominance promotes behaviors of avoidance and are negatively correlated to judgements of trustworthiness (Olszanowski, Kaminska & Winkielman, 2018).

Explicit Judgement: A judgement resulting from consciously controlled evaluation of a stimulus. Explicit judgments are assumed to arise from propositional processing which validates

already activated associations of mental representation (Gawronski & Bodenhausen, 2014; Myers & Twenge, 2017).

Idiosyncratic judgments: A component of an individual raw score that does not align with average ratings (Jaeger, 2021).

Implicit judgement: A judgement resulting from automatic evaluation of a stimulus. Implicit judgments are assumed to quickly arise from associative processing which has activated mental representation (Gawronski & Bodenhausen, 2014; Myers & Twenge, 2017).

Mask: In this paper, masks will refer exclusively to face coverings that are employed to cover the nose and mouth areas of a face.

Processing: A systematic use of mental operations during cognition (Goldstein, 2019).

Therapeutic Alliance: A coalition between clinician and client consisting of at least three elements: treatment goal agreement, task agreement, and a reciprocal positive bond (Krupnik, 2022).

Trust: A social inference or attribution that interaction with a target will not result in an unexpected outcome (Krupnik, 2022; Oruc, Balas & Landy, 2019).

Valence: A dimension upon which facial stimuli have been known to be evaluated. Judgements of valence fall along a continuum reflecting estimated emotional states of positivity and negativity (Olszanowski, Kaminska & Winkielman, 2018; Oosterhof & Todorov, 2008; Oruc, Balas & Landy, 2019). A perception of high valence promotes behaviors of approach, and are correlated to judgements of trustworthiness (Olszanowski, Kaminska & Winkielman, 2018).

CHAPTER TWO: LITERATURE REVIEW

Trust in a Clinical Counseling Therapeutic Environment

Despite the common-sense assumption that trust is deeply important, especially within a clinical counseling setting, there is a shocking lack of primary literature exploring this topic. Using two research databases in the month of October 2023, the search terms, “trust development” and, “counseling” yielded a total of a mere 118 hits. Of these, almost none of them were relevant to understanding practical client-clinician connections. Of the ones that may have been useful, none of them were published in the last 20 years. Using the same databases, a change in search terms to “trust” and “therapeutic alliance” yielded 0 hits. Changing the search terms again to “trust” and “therapeutic relationship,” also yielded 0 hits. In a discipline that prides itself on being evidence-based, there is much room for growth in how the ubiquitous concept of interpersonal trust is conceptualized, defined, assessed, and therapeutically employed.

Regardless other factors, the therapeutic alliance has been shown to have a profound impact on clinical mental health outcomes (Krupnik, 2022). Trust is regarded as an essential component of therapeutic alliances, and is defined by Krupnik (2022) as “an agents belief that its action will bring the expected sensory outcome from the partner’s response,” (p. 3). Perceived trust then involves social inferences and interactions by all present in an environment. Since both client and clinicians enter their session(s) with preconceived notions of their counterpart, both must foster trust responses in one another for a therapeutic alliance to produce desired clinical outcomes, and this would ideally be done right away with the initial session (Hutchison & Gerstein, 2017; Krupnik, 2022).

The very first interactions a clinician and client have can rapidly set the tone for their future relationship. This is particularly important in counseling because up to 57% of potential clients do not return after the first session, and up to 45% only attend twice (Schwartz, 2017). Considering these steep drop-out rates, establishing a sense of trust and safety as quickly as possible stands to benefit both client and clinician.

How important are first impressions? First impressions have been demonstrated to be predictive of relationship quality later (Human et al., 2013; Mastroianni, 2020). It is thought that first impressions may even be a causal factor in the formation of subsequent social judgments because they set expectations for future behaviors and function as a template for future interactions (Mastroianni, 2020). Brief initial encounters of faces should not be underestimated in importance, fleeting though they may seem. Facial appearance exerts lingering effects on personality evaluations. Petrican, Todorov, and Grady (2014) found that facial appearance affected personality evaluations of long-term spouses. Shen and Ferguson (2021) remark that what is seen on a face in less than a second strongly affects implicit evaluation of that face, and that the resultant judgement is challenging to change later.

Trust Responses in First Impressions

How fast is a first impression of trust formed? Fowler, Lillenfeld and Patrick (2009) found that social judgements about the mental health of others are made in seconds and are most accurate when done quickly. Nonexpert participant raters were given 5-second, 10-second, and 20-second excerpts of maximum-security inmates being interviewed. Participants rated the targets on psychopathy and other measures. It was found that raters were more accurate in predicting target psychopathy when using 5-second exposures than 20-second

exposures. It was also found that psychopathy can be distinguished from other personality traits based on first impressions, even by raters who are not trained experts in personality disorders. A limitation of this study is that target excerpts were not standardized across participants, but rather randomly assigned to groups. The authors point out that they found no significant differences between groups.

Even though a mere 5-seconds may seem like a small amount of time, the window of time needed to form a first impression may be even smaller. In their seminal study, Willis and Todorov (2006) correlated five different social judgements made after only 100 ms of exposure to head-shot photographs of young adults to the same social judgments made without time constraints. The judgements they assessed included aggressiveness, attractiveness, competence, likeability, and trustworthiness. While all five were found to be highly reliable, trustworthiness accuracy was even higher than that of attractiveness. This reveals that important information can be extracted from simply observing a face for a fleeting amount of time.

Social judgements of trust, of course, are not fixed only on a first impression. Over time, Yu, Saleem and Gonzalez (2014) noted that effects of perceived target reciprocity were stronger than target facial appearance on participants who engaged in a simulated Trust Game. Shen and Ferguson (2021) demonstrated that implicit judgements of trust can change, especially when reliable negative information about a target is revealed. Please note though, how trust responses between client and clinician may change over time is beyond the scope of this literature review. What is being reviewed is the initial underlying processing of stimuli that leads to formation of perceived trust judgements.

Trust is a Social Judgement

Any discussion of social judgements would be incomplete without acknowledging how they are understood and described by experts. Many social judgements have been evaluated repeatedly in modern social psychology to explain common social phenomena and to predict behaviors or attitudes. A central theme that has emerged is that there is a difference between implicit and explicit social evaluation, but that these processes can be mutually influential in our dual attitude system (Baumeister & Bushman, 2021; Gawronski & Bodenhausen, 2014; Myers & Twenge, 2017). Implicit evaluation is commonly measured using spontaneous responses to sequential priming tasks, and results are inferred from differences in speed of responses (Gawronski & Bodenhausen, 2014; Payne & Lundberg, 2014). Explicit evaluation is commonly assessed by comparing self-report measures from participants level of agreement with a statement (Gawronski & Bodenhausen, 2014). Within cognitive psychology, the implicit and explicit nature of the mind is further used to describe various types of memory and memory-dependent behaviors (Bear, Connors & Paradiso, 2016; Goldstein, 2019). Using a paradigm to analyze and compare implicit and explicit judgements of trust is then appropriate and useful.

Masks in Healthcare and Social Settings

It is known that face coverings affect patients in healthcare environments. For instance, in a literature review by Marler and Ditton (2020)—which was published at the onset of the COVID-19 pandemic—usage of surgical masks was found to negatively impact the relationship of patients and clinicians. They drew on existing literature on masking that was mostly compiled prior to the COVID-19 pandemic. For patients, lack of rapport and connection with clinicians were reported as concerns. Physical barriers to auditory clarity and lip-reading cues from masks

disrupted communication and may have generated psychological and physiological distress. Because use of masks led to perceptions of reduced responsiveness and empathy by healthcare staff, both the patients' satisfaction of care and the clinician's sense of accomplishment were affected negatively.

It is also known that masking itself has become a politicized issue affecting many interpersonal and social behaviors (Young et al., 2022). Because the context about what is considered familiar and/or typical versus what is considered unfamiliar, atypical, or ambiguous guides behavior choices and emotions, individuals may have vastly different responses to masked faces depending on their background (Kaminska et al., 2020; Kusche & Barker, 2019; Sutherland et al, 2020; Young et al., 2022).

Intersection of Trust Judgement and Masking

Some studies about mask wearing have been done and published since the onset of COVID pandemic (Oliveira & Garcia-Marques, 2022; Olivera-La Rosa et al., 2020). This research examines connections between perception of masked faces and social judgements of trust. Olivera-La Rosa et al. (2020) found that masked faces were perceived to be more trustworthy than unmasked faces. They speculate that masks may have served as a positive cue for safety from germs during a pandemic.

Oliveira and Garcia-Marques (2022) found interactions between perceived trustworthiness and feature visibility of a face. Both when a mask covered the bottom-half of a face—and when faces were occluded by a grey box—untrustworthy faces received an increase in trust ratings. Findings like this hint at the idea that it is not necessarily the presence of face masks alone that affects perceived trust. They suggest that concealment of the bottom-face, by

a mask but not limited to masks, interferes with cognitive processes necessary for trust discrimination because the facial features themselves convey cues needed for trustworthiness discrimination. Fortunately, even before the pandemic scientists were interested in how the brain processes facial stimuli to arrive at judgements of trustworthiness.

Studying Trust using Facial Stimuli

The importance of trust judgements is certainly not limited to clinical counseling settings. It is ubiquitous in almost any social setting and has been the topic of many inquiries by scientists of varied backgrounds. A large body of research spanning many years exists to better understand the social factors and cognitive underpinnings of judgments of trust in response to facial stimuli (Ratala, 2018; Oosterhof & Todorov, 2008; Oruc, Balas & Landy, 2019). For instance, Giacomin and Rule (2017) isolated the eyebrows as a key facial feature that has been used to accurately assess for narcissism. Balas and Verdugo (2018) found that horizontal visual information is necessary and sufficient for formation of judgements of trust. This literature highlights only a limited number of the many available published works examining judgements of trust.

While judgements of trust are not thought to be solely based on facial cues, facial cues specifically are preferred in decision-making and have been relied on even when they are believed to be less valid than other relevant information. (Jaeger, 2021; Jaeger et al., 2019). Evaluations of facial trust have come to be regarded as critical to numerous social interactions, and they happen quickly whether people have been instructed to make judgements or not (Engell, Haxby, & Todorov, 2007; Shen & Ferguson, 2021). These social evaluations broadly range from interpersonal attraction to criminal justice outcomes and more (Murray & Schaller,

2016; Oruc, Balas & Landy, 2019; Sutherland et al, 2020). Jaeger et al. (2019) suggest that people who rely heavily on heuristic processing may weigh intuitive cues of facial trust higher than other sources of information when they make a decision. Due to the meaningful and impactful nature of social judgements on a daily level, how these evaluations arise from facial cues warrants ongoing study (Jaeger et al., 2019; Olszanowski, Kaminska & Winkelman, 2017).

Learning about trust judgements through laboratory studies using quantitative methodology is reasonable, even though clinical environments are quite different than lab settings. While judgements of trust are subject to change based on social interactions over time, target facial appearance is predictive of trusting behaviors (Yu, Saleem & Gonzalez, 2014). Furthermore, photographs and short exposures of videos illicit reliable target trust ratings from participants such that longer exposure does not substantially improve upon these judgements (Fowler, Lillenfeld & Patrick, 2009; Willis & Todorov 2006). Lische et al. (2018) noted that groups of participants who saw differing facial stimuli from the same faces—notably some viewed stimuli with color and full feature visibility but others viewed stimuli in grey scale with limited feature visibility—all provided "nearly identical" ratings (p. 185).

Limitations Of Using Facial Stimuli

There are some limitations to the study of trust using facial stimuli in a laboratory setting. Matsumoto and Hwang (2018) highlight the need to use caution when examining judgements made from facial cues because artifacts, such as hairstyle, can influence results and therefore should be considered carefully when interpreting the results of research conducted with the use of face coverings. Additionally, results presented by Aviezer, Trope and Todorov (2012) suggest that wholistic perception of people and their emotions arises from faces and

body stimuli as a gestalt rather than as summation individual features. This is an intuitive finding because faces in the wild are not usually separated from bodies. Emotional information is conveyed from overall posture and other non-verbal cues present in the body as well as the face. In fact, Nelson and Mondloch (2017) concluded that postural cues may exert a more powerful effect on judgements of facial expression than previously thought. They used both static and dynamic stimuli of full bodies developed from filmed male and female actors exhibiting the following four emotions: happiness, sadness, anger, and fear. Using digital editing software, they developed stimuli where facial expressions were congruent and incongruent with body postures. Data was collected using SMI eye-tracker on adult and children participants. Adults were found to gaze at faces more than children, incongruent body expressions of anger drew attention away from faces, and fixations on angry and fearful faces increased with incongruent body postures.

One possible explanation for the findings by Nelson and Mondloch (2017) is that social inferences garnered from dynamic stimuli—which are far more akin to every-day experiences of human perception than static facial stimuli ever could be—are body dominated with little influence of the face. This has important implications for how trust and other emotional judgements are studied. They do not argue that studies using isolated facial expressions are valueless, but rather that contextual cues beyond isolated static faces provide vital information for emotion recognition in adults and children and therefore should be increasingly utilized in research to provide a complete understanding of social inferences.

Jenkins et al. (2011) found that photographs do not reflect the actual appearance of any given person. Attractivity rankings for a given face vary greatly, and attractivity ratings for a

given person depend upon the photograph more than upon the face. Familiarity with identity improves correct identification of ambient faces. Participants rated 20 different photographs of 20 celebrities for attractivity and other factors. It was found that within-person variability was greater than between-person variability. Additionally, familiarity with celebrity faces decreased misidentifications of face identities. This study delineates why using static face images in research has obvious limitations due to the way such images are processed. Static photographs are different than real faces outside a controlled laboratory setting where lighting, context and a host of other variables can change moment to moment. There is even evidence that impressions of a single target differ greatly, depending on how their image is captured (Shen & Ferguson, 2021). However, many studies using facial stimuli in laboratories are not intended to capture real-time actionable trust responses to the people represented in target photos, but rather to gather information on the underlying cognitive processes at work in participants.

An additional note on facial stimuli selection is also in order. Types of facial stimuli are not consistent across all studies reviewed here. For instance, some stimuli were prepared from participant faces and transformed using software (Petrican, Todorov & Grady, 2014), some stimuli were borrowed from previous stimulus sets derived from internet photos (Carragher, Thomas & Nicholls, 2021), and other stimuli came from research databases (Balas & Verdugo, 2018; Jaeger et al., 2019). Various artifacts are present in some sets (Carragher, Thomas & Nicholls, 2021), and not in others (Giacomin & Rule, 2017). Some of the sets were shown in full color (Oliveira & Garcia-Marques, 2022; Petrican, Todorov & Grady, 2014), while others were presented in grey scale (Balas & Verdugo, 2018; Giacomin & Rule, 2017).

Cognitive Evaluation of Faces

Social inferences of trust based on facial stimuli are shown to be informed by at least two dimensions that facial features can be categorized on: valence and dominance (Kauschke et al., 2019; Olszanowski, Kaminska & Winkelman, 2017; Oosterhof & Todorov, 2008). While attractiveness has also been found to be an important dimension of social evaluation, it is excluded from this literature review to allow for a more targeted discussion (Oruc, Balas & Landy, 2019).

Valence

Valence is defined as, "pleasantness or unpleasantness of an emotional stimulus," and is a crucial factor in cognitive representation and categorization (Kauschke et al., 2019, p. 2). Valence can be conceptualized as being on a spectrum with anger on the low end and happiness on the high end (Olszanowski, Kaminska & Winkelman, 2017; Oosterhof & Todorov, 2008). Faces on the positive end of the valence spectrum signal happiness—or a similarly pleasant emotion—and usually yield prosocial behaviors of cooperation and/or approach (Olszanowski, Kaminska & Winkelman, 2017). Judgements of valence could be conceptualized as heuristics used to determine movement toward or away from a target (Jaeger et al., 2019; Oosterhof & Todorov, 2008). A face low in valence probably looks angry, and people will probably avoid such a target. A face high in valence probably looks happy, and people may approach such a target.

While "valence" is not the same as "trustworthiness", in the literature these terms are sometimes used interchangeably to describe the way facial stimuli vary (Oruc, Balas & Landy, 2019). To say that a target looks trustworthy does not necessarily mean that people will

actually trust that target, it means that they perceive it as pleasant, and that the valence of the face is high.

Dominance

Dominance can also be conceptualized as existing along a spectrum (Olszanowski, Kaminska & Winkelman, 2017). Faces low on this dimension, which have been characterized as either happy or sad, can elicit "approach-like reactions," due to supposed inferences of sympathy and compassion about those targets (Olszanowski, Kaminska & Winkelman, 2017, p. 1033). Features characterized as high in dominance appear to be mature, masculine, or emoting anger (Oosterhof & Todorov, 2008). Judgements of dominance could be conceptualized as heuristics used to gauge a targets' ability to initiate harm (Jaeger et al., 2019; Oosterhof & Todorov, 2008). Targets high dominance elicit avoidant responses from participants such as fear. To say that a target looks dominant means that it looks strong or mature in some way.

Factors Affecting Cognitive Evaluation

Fluency

Both valence and dominance can be perceived to be fluent or not. Fluency refers to the "ease of perceptual and conceptual mental operations," and has been measured using behaviors, participant ratings, and physiological properties (Olszanowski, Kaminska & Winkelman, 2017, p. 1032). Another way to describe fluency of a face would be the ease with which emotional expression can be classified. Increasing fluency facilitates ease of processing and has been shown to boost ratings of trust in neutral target faces in multiples studies (Olszanowski, Kaminska & Winkelman, 2017). On the other hand, if a face appears to display

more than one emotion at the same time (such as anger and happiness), or if the features on that face are ambiguous—so that the perceiver cannot quickly classify the stimuli into known categorizations (such as male or female genders)—cognitive processing is slowed and the perceiver experiences negative affect (Kaminska et al., 2020). Social evaluations then rely not only on visible stimuli, but also upon a perceiver's extant state of mind and body.

Configural and Featural Processing

Wilson et al. (2017) shows that perceiving the typical configuration of the features on a face—eyes above the nose, nose above the mouth—serves as an important bottom-up cue for identifying humanness. When participants were presented with inverted facial stimuli, judgements of trust were more strongly affected than judgements of dominance. Their findings lend credence to the idea that configural (or wholistic) face processing facilitates social inferences of trustworthiness.

On the other hand, Murphy, Gray and Cook (2020) posit changes in social ratings may be due to the difficulty of processing inverted stimuli rather than a complete disruption in configural processing itself. They showed participants faces through artificial viewing windows which swept across stimuli in multiple directions. They found performance decrements in both upright and inverted face viewing, suggesting that inverted faces also benefit from configural processing.

While configural processing of a face facilitates trust inferences, it is not the only way that humans process faces. Featural processing is an alternative to configural face processing. Featural processing, also known as analytical processing, involves encoding specific facial features "bit by bit" (Fincher, 2019, p.2)—rather than the eyes, nose, and mouth in concert

together—and is not associated with humanizing (Fincher 2019; Quadflieg et al., 2012; Wilson et al., 2017). Though faces are usually processed configurally in healthy individuals, findings by Quadflieg et al. (2012) may suggest that not all social judgements necessarily rely on configural processing alone, because incomplete facial information may suffice to generate social inferences. Their conclusion may need to be viewed with caution because their study centered around how social judgements by one individual with acquired prosopagnosia differed from social judgements made by a sample of university students.

Given that there is more than one way to process facial stimuli, questions arise about the importance of the individual features themselves. Is any one feature more salient, important, or favored over other features as it pertains to judgements of trust? There is conflicting evidence for which features are most needed to draw social inferences from. Fincher (2019) indicates that configural processing is disproportionately disrupted when eyes are occluded. Alternatively, Marler and Ditton (2020) indicate that cues displayed in the mouth region are important in inferring emotions.

Oliveira and Garcia-Marques (2022) investigated masking and occlusions of the bottom-face region with respect to impressions of dominance and trustworthiness. Judgements of trust were more strongly impacted by occlusions of the face than judgements of dominance. Participants viewed occluded and un-occluded faces portraying high- and low-trust targets as well as high- and low-dominance targets. Targets were both male and female. It was found that while participants could still make judgements of trustworthiness with occlusion, their judgements of trust were more inaccurate than their judgements of dominance when the bottom-face region was unobservable.

Krupnik (2022) describes a theoretical model that connects cognitive information processing to the role of trust in a therapeutic setting. Predictive processing is referred to as a process by which the mind constantly responds to cues in the environment by inferring causes of stimuli, and that the accuracy of these inferences—precision—is an important in reducing wasted energy in surprise sensory states. This relates to trust because trust itself is an organism's expectation that its own action will elicit a particular expected response from others. Accurate trust predictions then contribute to energy conservation, ensure survival, and are desired.

Threat Detection

In their review, Kauschke et al. (2019) found that detection-based tasks in a lab setting using facial stimuli often—but not always—produce negativity bias, which is a preferential processing of negative stimuli. Sagliano et al. (2016) examined attentional bias towards threat (ABT) using response times (RT) and pupil fixation data gathered from stimuli presented for three durations. Their findings support the ideas that attentional processes at early and late stages of information processing affect ABT and may have important clinical implications for future treatment of anxiety. Using a free-viewing activity without task demands, Lischke et al. (2018) found that untrustworthy faces illicted larger late positive potentials than trustworthy faces in young adults between 500-800 ms after stimulus onset. These findings also support the idea that bottom-up attentional processes are not the same for faces that vary in trustworthiness. Since amygdala activation has been associated with judgements of trust, these findings suggest a modulatory role in trustworthiness processing (Jaeger 2021; Lischke et al., 2018).

Visual Scanning Patterns

A triangular scanning pattern has been found in both seminal and recent studies using facial stimuli (Mehoudar et al., 2016). Multiple replications of this typical pattern suggest that the structure and content of a stimulus is one factor that determines eye movements implicated in attentional processing (Peterson & Eckstein, 2012). Task demands, such as identity recognition or emotion identification, is a factor that affects position and duration of eye movements (Malcom et al., 2008). Mehoudar et al. (2016) also identify another factor, namely individual strategy preferences. They found that individuals who fixated on the mouth did not perform worse on recognition tasks than individuals who primarily fixated on the eye area. Hul-went Hsiao and Cottrell (2008) found that eye fixations are different during face learning than during face recognition, and that those of face learning are more variable. Fixations for both tasks appear to cluster around the bridge of the nose, which funnily enough is approximately where the top edge of a mask rests as well.

Given that masks are not typically present on faces in the wild, could judgements of masked faces be affected by a disruption of the factors affecting cognitive processing, namely fluency, configural processing, or threat detection? An analysis of the timing of facial judgements could help elucidate such questions.

Variables in the Present Study

Consensual Judgements of Trust

Jaeger (2021) used a methodology which allowed for analysis of consensual trustworthy judgments distinct from idiosyncratic ones. Consensual perceptions are responses consistent with those of others, while idiosyncratic perceptions are unique to individuals. Consensual

judgements are those that most people would easily identify from features, such as a smile suggesting positivity. Idiosyncratic judgements are those that are based on similarity to a known entity, for example, the smile of a stranger could remind someone of their dear friend. Consensual perceptions are correlated to amygdala activation and may be affected by feature identification such as a smiling mouth. Idiosyncratic perceptions have not been found to be correlated to amygdala activation at this time. Jaeger's findings indicate that trusting decisions are independently affected by consensual and idiosyncratic perceptions of facial stimuli. Importantly, this suggests that individual trust in any given moment after a first impression can be derived from features visible in the stimulus as well as associations that are already linked with the target identity (Jaeger, 2021; Yu, Saleem & Gonzalez, 2014). Jaeger (2021) notes that future studies emphasizing consensual perceptions of trust are justified if the focus is on quantifying how target facial features—such as those obstructed by a mask—may be predictive of judgement outcomes.

Implicit and Explicit Judgements

Since as early as the 1960s, researchers have been interested in studying how automatic cognitive evaluation affects approach and avoidance behaviors (Duckworth et al., 2002). Over the years, it has been shown that two distinct—but interacting—systems of cognitive evaluation are used: associative and propositional (Gawronski & Bodenhausen, 2014). Associative evaluation gives rise to implicit judgements and can be measured using data gathered from performance-based tasks. On the other hand, propositional evaluation gives rise to explicit judgements, and data is gathered from self-report measures. Implicit and explicit judgements are not always expected to match one another (Gawronski & Bodenhausen, 2014).

Implicit judgements of novel stimuli have been found to be predictive of behavior, and longer exposure to a stimulus does not significantly change social judgement outcomes (Duckworth et al., 2002; Willis & Todorov, 2006).

Shen and Ferguson (2021) explore the topic of face-based trust impressions using an Affect Misattribution Procedure (AMP) to measure implicit judgements. After utilizing AMP they asked participants to explicitly evaluate the same target on a few 7-point social judgement scales. They wanted to know what kind of information presented about targets could change implicit evaluations, and for how such long changes would last. They found that implicit positive judgements could be changed, but the most effective way to do so was to present new extreme propositional information (written sentences indicating that the target had molested a child—extreme, or failed to pay a fine on time—mild) from a reliable source (such as a documented court ruling—highly reliable, as opposed to gossip in the work place—unreliable). Implicit changes were stable over three days, indicating the stability of updated impressions. While implicit judgements can be changed, it must be done intentionally. These authors also note that an existing bias against untrustworthy faces exists and that facial trust ratings do not convey objective truth about a person's character.

Trust Manipulations

Interesting effects have been found when manipulations of trustworthiness are employed in study methodology. For instance, untrustworthy faces were found to appear more trustworthy when viewed in a group while the same effect was not found on trustworthy faces (Carragher, Thomas & Nicholls, 2021). Untrustworthy faces were found to benefit from a face mask such that participants judged them as more trustworthy, while trustworthy faces did not

experience a similar boost in trust ratings (Oliveira & Garcia-Marques, 2022). Manipulations of facial trust have been used in many of the other studies reviewed here and are necessary to assess change(s) in stimuli-driven trust discrimination (Balas & Verdugo 2018; Lischke et al., 2018; Olszanowski, Kaminska & Winkelman, 2017; Oosterhof & Todorov, 2008; Shen & Ferguson, 2021).

The Present Study

The current study uses a paradigm examining consensual implicit and explicit responses, expanding on previous work which largely used explicit measurements of social judgement alone. It incorporates manipulations of trust, which are well established in past research, but it also includes manipulations of facial stimuli relative to timely social concerns about masking in a clinical setting.

CHAPTER THREE: METHODOLOGY

Human Subject Approval

Approval from the Minnesota State University Moorhead (MSUM) Institutional Review Board (IRB) was granted on February 20, 2024 and is included in Appendix A.

Design and Predictions

In this quantitative study, a 2(trustworthiness) x 5(facial feature visibility) within-subjects factorial design will examine a measure of implicit positivity as well as measures of explicit valence, dominance, and trust responses to facial stimuli. A Likert scale consisting of four responses was used to collect all responses so that outcomes are easily comparable (Payne & Lundberg, 2014).

It is predicted that implicit evaluation was most positive for high-trust targets that are fully visible in the upright position and lowest for low-trust targets that are fully visible in the upright position (Payne & Lundberg, 2014; Willis & Todorov 2006; Wilson et al., 2017).

It is predicted that explicit evaluations of all levels of low-trust targets, whether covered or inverted, will be different than explicit evaluation of the low-trust fully visible condition in the upright position (Oliveira & Garcia-Marques, 2022; Oosterhof & Todorov, 2008; Wilson et al., 2017).

It is predicted that explicit trustworthiness evaluations of targets in high-trust covered conditions would be similar to explicit evaluation of high-trust images in the fully visible upright condition, and that the high-trust inverted condition would receive the lowest ratings among all high-trust visibility levels. (Oliveira & Garcia-Marques, 2022; Oosterhof & Todorov, 2008; Wilson et al., 2017).

Participants

Participants were recruited from Minnesota State University Moorhead's (MSUM) pool of undergraduate psychology students and from graduate counseling students. Thirty one students were recruited in-person during class lectures and in an online announcement posting (M = 23.74, SD = 10.01). Each participant was given up to 20 minutes to complete all parts of the study. Participants received extra credit for their respective courses as compensation for participation. Participants completed a demographic survey assessing age, gender, and handedness but due to a technological oversight, only age responses were recorded.

Materials

Informed Consent, Demographics, and Debriefing

Participant age was collected along with their subject number before the first user interface in E-Prime was visible. Informed consent information was then presented to each participant using E-Prime software. Before answering demographic questions, participants indicated their eligibility for the study and their consent by pressing the key "Y" for yes or "N" for no. All collected data was stored on password protected laboratory computers. Debriefing information was presented in printed form.

Stimulus Set

Images of target faces from the Chicago Face Database (CFD) were used, see Table 1 and Table 2 (Ma et al., 2015). Ultimately, 12 unique faces portraying neutral emotional expression were observed. Gender and race were held constant (i.e., white males) on target faces so that the salience of these factors did not nebulize judgments of trust (Wilson et al., 2017). Target stimuli included 6 high-trust target faces and 6 low-trust faces. High-trust targets were

previously rated by CFD respondents and found to be found to be between 3.77 and 3.92 on a 7-point Likert scale for trustworthiness (*M* = 3.21, *SD* = 0.41), whereas low-trust targets were rated between 2.31 and 2.70. Stimuli images were further manipulated in 4 ways to reflect changes in visibility. These manipulations created five levels with which to analyze stimuli visibility: fully visible (control), masked, top only, bottom only, and inverted. Target faces had surgical masks digitally added in to cover their nose and mouth, had grey bars added to occlude top-region or bottom-region visibility, and were inverted 180 degrees (Oliveira & Garcia-Marques, 2022; Wilson et al., 2017). The appearance of face coverings was held constant in all edited images, and images were converted from color to grey scale (Balas & Verdugo 2018; Matsumoto & Hwang, 2018).

Data Collection

Implicit Data Collection

E-prime software was used and AMP protocol was followed to assess implicit evaluations of pleasantness (Payne & Lundberg, 2014; Shen & Ferguson, 2021). Participants were instructed to disregard target primes, and to base their judgements on the pictographs (Payne & Lundberg, 2014). AMP involved 420 total trials, with each factorial group receiving 47 trials each. On each trial, a randomized target face was used as a prime for 75 milliseconds. Immediately following facial prime presentation, participants observed a 100 millisecond presentation of a randomly selected pictograph obtained from University of North Carolina at Chapel Hill. (Payne, n.d.).

After primes and pictographs were presented, participants responded to the question, “How pleasant did you find the pictograph?”. This question was developed for the study and is

based on previous implementation of AMP (Shen & Ferguson, 2021). Participants were able to respond by pushing a key on a standard keyboard. Responses included keystrokes corresponding to *Most Unpleasant*, *Unpleasant*, *Pleasant*, and, *Most Pleasant*. AMP protocol was administered as the first part of the experiment for all participants so that prolonged exposure to target faces for explicit data collection did not confound implicit judgements (Gawronski & Bodenhausen, 2014). A fixation cross was presented in between individual target presentations (Lischke et al., 2018).

Explicit Data Collection

Three sets of explicit data were collected from participants: valence, dominance, and trust judgements. The collection of valence and dominance data was counterbalanced as the second or third part of the experiment. Data on trust judgements was always collected last.

Valence judgements were collected using E-prime and participants viewed the full stimuli set of 60 randomized targets with no time restriction. Participants were asked to press a key for responses to the question, “How likely are you to approach this person?” A solid colored grey screen was be presented in between individual target presentations. A 4-point Likert scale was used. Participants responded by using four keys on a keyboard corresponding to: *Very Unlikely*, *Unlikely*, *Likely*, and *Very Likely*. This question was developed for the study and is based on findings that the valence is essentially a cognitive overgeneralization which signals approach or avoidant behaviors (Oosterhof & Todorov, 2008). If slow response times are found in some conditions, it will be thought to indicate that social judgement ratings in those conditions were affected via valence evaluation.

Dominance judgements were collected using E-prime software and participants viewed the full stimuli set of 60 randomized targets with no time restriction. They provided responses to the question, “Does this target appear weak or strong to you?” A solid colored grey screen was be presented in between individual target presentations. A 4-point Likert scale was used. This question was developed for the study. Participants responded by using four keys on a keyboard corresponding to: *Very weak*, *Weak*, *Strong*, and *Very Strong*. This question was developed for the study and is based on findings that the dominance dimension of face evaluation is essentially a cognitive overgeneralization which signals an estimation of physical strength or weakness of a person (Oosterhof & Todorov, 2008).

Trust judgements were collected using E-prime software and participants viewed the full stimuli set of 60 randomized targets with no time restriction. They provided responses to the question, “Based on your initial reaction, how trustworthy does this person seem to you?” (Olivera-La Rosa et al., 2020). A solid colored grey screen was be presented in between individual target presentations. A 4-point Likert scale was used. Participants will respond by using keys on a keyboard corresponding to: *Not At All, A Little Bit*, *Moderately*, and *Completely*.

CHAPTER FOUR: RESULTS

Overview

Eight fully repeated measures 2x5 ANOVAs with known trustworthiness (high- or low-trust) and feature visibility (plain, masked, bottom open, top visible, inverted) were run, one for each set of data collected. Order effects of the counter balanced blocks were checked prior to every ANOVA. If Mauchley's Test of Sphericity was found to be significant, a Greenhouse-Geisser correction was used in reporting. The Likert responses were treated as numerical, as this is commonly used in the behavioral sciences. Each participant provided multiple ratings in each condition, so ratings and response times were averaged such that participants had one score on each variable in each of the 10 conditions.

Some participants took longer than expected to complete AMP protocol and were dismissed before completing every part of the study. There was also a technical oversight for the dominance part of the experiment for some participants, so this part had fewer responses compared to the other parts.

Implicit Pleasantness Ratings

A chi-square preliminary analysis of the AMP data suggested that pictogram presentation and participant responses were independent events. Additionally, there was no bias toward any particular response and so it was presumed that individual pictograms did not influence participant ratings of pleasantness.

A 2x5 ANOVA revealed that for ratings of pleasantness, a main effect of trust was found, $F(1, 30) = 21.17$, $p = .000$, $\eta_p^2 = .414$, but no main effect of visibility was found $F(2.51, 75.18) =$

2.53, p = .074. Participants rated high-trust faces as more pleasant in all visibility conditions they rated low trust faces, all ps < .05, see Figure 1.

An interaction between trust and visibility was found for ratings of pleasantness, F(2.87, 86.03) = 8.82, p = 0.000, η_p^2 = 0.227. Out of 10 post hoc possible pairwise comparisons in the low-trust condition, all visibility conditions were shown as p > .05. Out of an additional 10 pairwise comparisons for high-trust faces, three significant differences were found for ratings of pleasantness and are summarized in Table 4. Notably, among high-trust faces, plain faces were rated highest (M = 2.82, SD = .08), and were significantly higher than ratings of bottom open faces, which were rated the lowest (M = 2.41, SD = .10), p = .007.

Explicit Valence Ratings

A 2x5 ANOVA revealed that for participant likelihood to approach a target, a main effect of trust was found, F(1, 29) = 42.23, p = 0.000, η_p^2 = .593, but that a main effect of visibility was not, F(2.29, 66.49) = 2.65, p = 0.071. Participants rated themselves as more likely to approach high-trust faces in every visibility level than they were to approach low-trust faces, all ps < .05, see Figure 2.

An interaction between trust and visibility was found for ratings of likelihood to approach, F(4, 116) = 4.06, p = 0.004, η_p^2 = 0.123. Post hoc tests indicated only one significant difference among all visibility levels for low-trust targets. Out of 10 possible pairwise comparisons in the low trust condition, masked faces (M = 2.04, SD = 0.10), which were the highest, were rated significantly higher than top visible masked faces (M = 1.89, SD = 0.08), which were rated the lowest, p = .046. Out of an additional 10 pairwise comparisons for high-trust faces, five significant differences were found and are summarized in Table 4. Notably,

among high-trust faces, plain faces were rated highest (*M* = 2.68, *SD* = .12), and were significantly higher than ratings of bottom open faces, which were rated the lowest (*M* = 2.27, *SD* = .11), *p* = .293.

Explicit Dominance Ratings

A 2x5 ANOVA revealed that for ratings of strength, a main effect of trust was found, $F(1, 23) = 44.61$, $p = .000$, $\eta_p^2 = .660$, but that a main effect of visibility was not, $F(1.93, 44.43) = 1.42$, $p = .253$. Participants rated low-trust faces in all visibility conditions as stronger than high trust faces, all *p*s < .05, see Figure 3. There were no significant interactions found among factors of trust and visibility for ratings of strength, $F(4, 92) = 1.34$, $p = .263$. The strongest rated targets were low-trust plain faces (*M* = 3.00, *SD* = .09) and the weakest rated targets were high-trust bottom open faces (*M* = 2.24, *SD* = .11).

Explicit Trustworthiness Ratings

A 2x5 ANOVA revealed that for ratings of trustworthiness, a main effect of trust was found, $F(1, 29) = 32.08$, $p = .000$, $\eta_p^2 = .525$, but a main effect of visibility was not found, $F(1.95, 56.44) = 2.11$, $p = .132$. Participants rated high-trust faces as more trustworthy than low-trust faces in every visibility level, all *p*s < .05, see Figure 4.

An interaction between trust and visibility was found for ratings of trustworthiness, $F(4, 116) = 5.91$, $p = .000$, $\eta_p^2 = .169$. Out of 10 post hoc possible pairwise comparisons in the low-trust condition, all visibility conditions were shown as $p > .05$. Out of an additional 10 pairwise comparisons for high-trust faces, five significant differences were found and are summarized in Table 4. Notably, among high-trust faces, plain faces rated were rated highest

(*M* = 2.58, *SD* = .12), and were significantly higher than ratings of bottom open faces, which were rated the lowest (*M* = 2.12, *SD* = .12), *p* = .000.

All Response Times

No effects of any type was found in any part of the study for response times, and none of the 10 conditions were found to be responded to faster or slower than any other condition for any given part.

For implicit ratings of pleasantness, a main effect of trust was not found $F(1, 30) = 2.86$, $p = .101$, a main effect of visibility was not found $F(2.608, 78.255) = 2.07$, $p = .119$, and was an interaction between these factors was not evident $F(2.919, 87.564) = 1.92$, $p = .134$ on response times.

For explicit ratings of valence, a main effect of trust was not found $F(1, 29) = .00$, $p = .958$, a main effect of visibility was not found $F(4, 116) = .913$, $p = .459$, and was an interaction between these factors was not evident $F(4, 116) = 1.34$, $p = .260$ on response times.

For explicit ratings of dominance, a main effect of trust was not found $F(1, 23) = .05$, $p = .820$, a main effect of visibility was not found $F(4, 92) = 1.24$, $p = .260$, and was an interaction between these factors was not evident $F(4, 92) = .91$, $p = .460$ on response times.

For explicit ratings of trustworthiness, a main effect of trust was not found $F(1, 29) = .07$, $p = .799$, a main effect of visibility was not found $F(2.686, 77.908) = .82$, $p = .473$, and was an interaction between these factors was not evident $F(4, 116) = 1.72$, $p = .150$ on response times.

CHAPTER FIVE: DISCUSSION

Discussion of Ratings

The common theme across all four parts of this experiment was that a main effect of trust was evident in participant ratings, but a main effect of visibility was not. None of the predictions that were made at the outset were born out in the analyses.

With no main effects of visibility, the mere removal of facial information was not here shown to affect discriminability of trustworthiness on target faces due to valence or dominance judgements using these stimuli sets. Findings from Oliveira and Garcia-Marques (2022) that suggested otherwise at the height of the COVID-19 pandemic were not here replicated. Although methodologies were similar, their analyses were not the same as the ones used in the present study. They used a 3 factor ANOVA, one factor of which was a face dimension pole, as their stimuli were known to vary in dominance and trustworthiness.

In all significant interactions between trust and visibility, the high-trust fully visible conditions were rated higher than the high-trust occluded conditions with only the nose and mouth visible. It could be tentatively and cautiously concluded that consensual trust judgement discrimination depends more on access to the eyes or upper face region than the lower face region, which is an interpretation put forth in literature (Oliveira & Garcia-Marques, 2022). In contrast, there was one significant interaction in one part of the study—when asked if they would approach a target—where participants preferred the low-trust masked targets over the occluded low-trust targets with eye visibility. It is possible that this finding hints at participant preference for masking due to familiarity with covid masks. Previous studies lend support to the notion that visual familiarity affects performance via cognitive load demands (Schneider,

Vergauwe, & Camos, 2024). Other work suggests that familiarity may facilitate minimal representation of faces in working memory (Jackson & Raymond, 2008). The possible effects of familiarity are beyond the scope of the present research, but could be explored in the future. If familiarity was impacting ratings in this study, it should be noted that the increased ratings for the mask condition over occlusion were only observed in one part of the study, and only among low trust faces. Another possible interpretation is that masking preserves contours and shape of a face that an artificial grey box does not. Such an interpretation would be consistent with previous findings that perceptions of trustworthiness may be based on facial morphology (Kleisner et al., 2013).

It was predicted that implicit evaluation would be most pleasant for high-trust targets that are fully visible in the upright position and lowest for low-trust targets that are fully visible. This prediction was not confirmed in the data. High-trust fully visible plain targets were clearly rated highest and had the lowest *SD*, but all visibility conditions for low-trust targets were equally (un)pleasant. Interestingly, high-trust masked and occluded targets were rated similarly as low-trust fully visible targets. High-trust inverted targets were not rated significantly different than high-trust fully visible targets. It is perplexing that masking targets would have more impact on ratings than turning them upside down. However, Psalta et al. (2014) demonstrate that local featural inversion effects, commonly referred to as "The Thatcher Illusion," are better explained by disruptions in local featural processing than the spatial relationships between features. The body of literature exploring the effects of inversion on facial processing is not conclusive in suggesting that either configural or featural processing is primarily disrupted (Psalta et al., 2014; Veres-Injac & Schwaninger, 2007). Although no

Thatcherized stimuli were used in the present study, given that faces in this part of the experiment had been seen numerous times, it is possible that participants could recognize the identity of the inverted faces relative to upright fully visible faces since all the features were visible. In contrast, masked and occluded faces lack the necessary features from which to calculate second-order relational information needed in configural processing (Maurer, Le Grand & Mondloch, 2002). Perhaps the identity of the covered faces were less associated with their relative fully visible counterparts than inverted faces were.

It was predicted that explicit evaluations of low-trust targets, whether covered or inverted, will be different than explicit evaluation of fully visible low-trust images in the upright position. This idea sprung from the notion that low-trust faces might convey disparate regional cues of trust, but this prediction was not confirmed in the data. There was no significant difference in explicit ratings of any of the three parts between the low trust fully visible condition and other low-trust visibility conditions. Surprisingly, what was found were significant differences between explicit ratings of the high-trust fully visible condition and other high-trust visibility conditions. If there were any interesting disparate regional findings, it would only have been in one part of the experiment: between explicit trustworthy ratings of high-trust occluded faces, not low-trust ones. Since the predicted pattern of results was not found for ratings or response times, further analysis broken down by individual target identity sets could elucidate possible reasons as to why this was the case.

It was predicted that explicit trustworthiness evaluations of targets in the high-trust covered conditions would be similar to explicit evaluation of high-trust images in the fully visible condition, and that the high-trust inverted condition would receive the lowest ratings

among all high-trust visibility levels. This prediction too was not confirmed in the data. The high-trust masked and bottom open conditions were found to be rated as less trustworthy than the high-trust fully visible upright condition. The high-trust inverted condition was found to be significantly less trustworthy than the upright fully visible condition, but not significantly less trustworthy than the covered conditions.

Limitations and Future Directions

One limitation of this study is the limited demographic distribution of the participants and the stimuli (Biernat & Manis, 1994; Oruc et al., 2019). Gender and ethnicity of the participants was not reported, and only white male stimuli were used. Would results be the similar or different if the same participants observed female faces? Other studies have identified significant impact of gender on facial judgments (Alaei et al., 2022; Qi & Ying, 2022).

Importantly, Oruc, Balas and Landy (2019) mention in their review that social judgements drawn from facial stimuli vary cross-culturally and that not all populations appear to evaluate faces according to the dimensions of valence and dominance alone. They mention that non-western participants, the Chinese specifically, prefer competence over dominance. Any results found from primarily one ethnicity, then, should not be assumed to broadly apply to any and all potential clients a clinician encounters.

If the amygdala is in fact modulating trustworthiness processing, screening participants for conditions that are known to affect this part of the brain would be reasonable in future studies (Lischke et al., 2018). At least one study included in the literature review assessed their participants for state anxiety, but they did not find any effect on the number of pupil fixations relative to threatening stimuli at 100, 200, or 500ms (Sagliano et al., 2016).

Clinical Implications

Krupnik (2022) asserts that meeting a client's expectations of a clinical therapeutic encounter is important in reducing surprising sensory states during appointments. It is suggested that doing so will motivate the client to suspend defensive behaviors in favor of exploration. Coming to understand exactly what clients have come to expect of masking policies in a therapeutic setting is a timely matter given the current CDC's recommendations. Notably, effects on trust judgements based on faces with and without surgical masks can be attributed to the removal of visible facial cues and not only to the social norms associated with their usage (Oliveira & Garcia-Marques, 2022). Preparing counseling agency masking policies with this in mind, as well ongoing training for clinicians to navigate cultural influences on relevant Cultural Display Rules (CDR) could be a pathway toward improved therapeutic alliances and reducing potential client disappointment or discomfort in a therapeutic environment (Hutchison & Gerstein 2017; Krupnik, 2022). Jaeger et al. (2019) include some suggested interventions which may curb facial biases, but they admit skepticism when it comes to eliminating all reliance on facial cues. While it appears that forming implicit evaluations is easy, changing such impressions is not (Jaeger et al., 2019; Shen & Ferguson, 2021).

The potential exists for face masks to affect a therapeutic environment in multiple ways. Client expectations about whether their clinicians should be masked is one way. Another is the potential effects the mask may have on clinicians as they are expected to be attuned to client nonverbal expressions of emotion (Hutchison & Gerstein 2017). Questions remain about how occlusion of the bottom-face region affects a clinician's ability to do this. Face coverings were demonstrated to impact cognitive judgments of trust during a pandemic by Oliveira and Garcia-

Marques (2022), but their findings not having been replicated in the current study. Their responses were collected at the beginning of the COVID-19 as lockdowns were being implemented in the United Kingdom, and the present study's responses were collected at a time when no mandatory masking policies were still in effect in the United States. How masks may impact rapport, expectations, attendance, or therapeutic alliances in a clinical counseling setting could be examined further.

If masks could be conclusively shown to change trust judgements in clinical settings, other protective methods could be indicated. Face shields, in at least one study, have been demonstrated to offer reasonable protection from small inhalable particles (Wendling et al., 2021). While such a shield would not block perception of facial features, it is unknown if such a shield itself would elicit surprising sensory states in clients due to its notable shiny appearance, strange apparatus shape, or overall unwanted presence as a barrier between client and clinician at counseling sessions.

Regardless of whatever masking or shielding intervention(s) would be used for protection during a pandemic, consideration for client and clinician physical comfort as well as sensory needs in session should not be overlooked. After all, any needed protective barrier that touches the skin could be distracting. Perhaps offering multiple protective options for people to choose from would convey appreciation for their comfort and respect for CDC safety recommendations. Perhaps a frank discussion about what a client expects in a phone call prior to meeting a clinician for the first time could also help in this regard. Such a conversation could be had when a client schedules a visit or when necessary intake paperwork is disseminated.

Conclusion

A large body of literature exists to better understand cognitive judgments of trust. Even so, Olszanowski et al. (2018) argue that more research is warranted in coming years to appreciate how stimulus features of a face affect cognitive processing and social judgements. Possible clinical implications for counseling professionals were here explored as they may relate to first impressions. How trust judgements with(out) face coverings are found to affect perceived quality of care in non-counseling health professionals is another area of study that stands to impact consumers and clinicians in any health care setting that will continue to use surgical masks—even without specific COVID-19 pandemic mandates.

References

Alaei, R., Deska, J. C., Hugenberg, K., & Rule, N. O. (2022). People Attribute Humanness to Men and Women Differently Based on Their Facial Appearance. Journal of Personality & Social Psychology, 123(2), 400–422. https://doi-org.trmproxy.mnpals.net/10.1037/pspi0000364

Balas, B., & Verdugo, M. Q. (2018). Low-level orientation information for social evaluation in face images. *Psychonomic Bulletin & Review, 25*(6), 2224–2230. https://doi-org.trmproxy.mnpals.net/10.3758/s13423-018-1438-5

Baumeister, R. F., & Bushman, B. J. (2021). *Social psychology and human nature* (5th ed.). Cengage. 5th edition eBook ISBN: 9780347700792; 5th edition hardback ISBN: 9780357122914.

Bear, M. F., Conners, B. W., & Paradios, M.A. (2016*). Neuroscience: Exploring the Brain, Enhanced Fourth Edition*. Jones & Bartlett Learning.

Biernat, M., & Manis, M. (1994). Shifting standards and stereotype-based judgments. *Journal of Personality and Social Psychology*, *66*(1), 5–20. https://doi-org.trmproxy.mnpals.net/10.1037/0022-3514.66.1.5

Bryan, R., Perona, P., & Adolphs, R. (2012). Perspective distortion from interpersonal distance is an implicit visual cue for social judgments of faces. *PLOS ONE, Vol 7*(9), e45301. http://doi.org /10.1371/journal.pone.0045301

Brennan, N., Barnes, R., Calnan, M., Corrigan, O., Dieppe, P., & Entwistle, V. (2013). Trust in the health-care provider–patient relationship: a systematic mapping review of the evidence

base. *International Journal for Quality in Health Care*, *25*(6), 682–688. https://doi-org.trmproxy.mnpals.net/10.1093/intqhc/mzt063

Carragher, D. J., Thomas, N. A., & Nicholls, M. E. R. (2021). The dissociable influence of social context on judgements of facial attractiveness and trustworthiness. *British Journal of Psychology*, *112*(4), 902–933. https://doi-org.trmproxy.mnpals.net/10.1111/bjop.12501

Centers for Disease Control and Prevention. (2022, August 12). *Science Brief: Indicators for Monitoring COVID-19 Community Levels and Making Public Health Recommendations.* https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/indicators-monitoring-community-levels.html#anchor_1646356881987

Consensual and idiosyncratic trustworthiness perceptions independently influence social decision-making. (2021). *European Journal of Social Psychology, 51*(7), 1172–1180. https://doi-org.trmproxy.mnpals.net/10.1002/ejsp.2806

Duckworth, K. L., Bargh, J. A., Garcia, M., & Chaiken, S. (2002). The Automatic Evaluation of Novel Stimuli. *Psychological Science*, *13*(6), 513–519. https://doi-org.trmproxy.mnpals.net/10.1111/1467-9280.00490

Engell, A. D., Haxby, J. V., & Todorov, A. (2007). Implicit Trustworthiness Decisions: Automatic Coding of Face Properties in the Human Amygdala. *Journal of Cognitive Neuroscience*, *19*(9), 1508–1519. https://doi-org.trmproxy.mnpals.net/10.1162/jocn.2007.19.9.1508

Essentia Health. (n.d.) *COVID-19 (Coronavirus) Updates.* Retrieved April 1, 2023 from https://www.essentiahealth.org/covid-19/

Fincher, K. M. (2019) Social antecedents and perceptual consequences of how we look at others. *Journal of Experimental Psychology: General, 148*(1), 143-157. http://dx.doi.org/10.1037/xge0000506

Fletcher-Tomenius, L. J., & Vossler, A. (2009). Trust in online therapeutic relationships: The therapist's experience. *Counselling Psychology Review*, *24*(2), 24–33. https://doi-org.trmproxy.mnpals.net/10.53841/bpscpr.2009.24.2.24

Fowler, K. A., Lillenfeld, S. O & Patrick, C J. (2009). Detecting Psychopathy From Thin Slices of Behavior. *Psychological Assessment, 21*(1) 68-78. 10.1037/a0014938

Gawronski, B., & Bodenhausen, G. V. (2014). Implicit and Explicit Evaluation: A Brief Review of the Associative-Propositional Evaluation Model. Social & Personality Psychology Compass, 8(8), 448–462. https://doi-org.trmproxy.mnpals.net/10.1111/spc3.12124

Giacomin, M., & Rule, N. O. (2019). Eyebrows cue grandiose narcissism. Journal of *Personality, 87*(2), 373–385. https://doi-org.trmproxy.mnpals.net/10.1111/jopy.12396

Goldstein (2019). *Cognitive Psychology: Connecting Mind, Research and Everyday experience, 5th Edition.* Cengage Wadsworth.

Hui-wen Hsiao, J., & Cottrell, G. (2008). Two Fixations Suffice in Face Recognition*. Psychological Science 19*(10): 998–1006. doi:10.1111/j.1467-9280.2008.02191.x.

Human, L. J., Sandstrom, G. M., Biesanz, J. C., and Dunn, E. W. (2013). Accurate first impressions leave a lasting impression: the long-term effects of distinctive self-other agreement on relationship development. *Social Psychology and Personality Science 4(*4), 395–402. 10.1177/194855 0612463735

Jackson, M. C., & Raymond, J. E. (2008). Familiarity Enhances Visual Working Memory for Faces. *Journal of Experimental Psychology: Human Perception and Performance*, *34*(3), 556–568. https://doi-org.trmproxy.mnpals.net/10.1037/0096-1523.34.3.556

Jaeger, B. (2021). Consensual and idiosyncratic trustworthiness perceptions independently influence social decision-making. *European Journal of Social Psychology*. https://doi.org/10.1002/ejsp.2806

Jaeger, B., Evans, A. M., Stel, M., & van Beest, I. (2019). Explaining the Persistent Influence of Facial Cues in Social Decision-Making. *Journal of Experimental Psychology. General, 148*(6), 1008–1021. https://doi-org.trmproxy.mnpals.net/10.1037/xge0000591

Jenkins, R., White, D., Van Montfort, X., & Mike Burton, A. (2011). Variability in photos of the same face. *Cognition, 121*(3), 313–323. https://doi.org/10.1016/j.cognition.2011.08. 001

Kaminska, O. K., Magnuski, M., Olszanowski, M., Gola, M., Brzezicka, A., & Winkielman, P. (2020). Ambiguous at the second sight: Mixed facial expressions trigger late electrophysiological responses linked to lower social impressions. *Cognitive, Affective & Behavioral Neuroscience 20*(2), 441-454. https://doi.org/10.3758/s13415-020-00778

Kauschke, C., Bahn, D., Vesker, M. & Schwarzer, G. (2019). The Role of Emotional Valence for the Processing of Facial and Verbal Stimuli—Positivity or Negativity Bias? *Frontiers in Psychology, 10*(2019) Article 1654. 10.3389/fpsyg.2019.01654

Kleisner, K., Priplatova, L., Frost, P., & Flegr, J. (2013). Trustworthy-Looking Face Meets Brown Eyes. *PLoS ONE*, *8*(1), 1–7. https://doi-org.trmproxy.mnpals.net/10.1371/journal.pone.0053285

Krupnik, V. (2022). The therapeutic alliance as active inference: The role of trust and self-efficacy. *Journal of Contemporary Psychotherapy: On the Cutting Edge of Modern Developments in Psychotherapy*. 1-9. https://doi-org.trmproxy.mnpals.net /10.1007/s10879-022-09576-1

Kusche, I. & Barker, J. (2019). Pathogens and immigrants: A critical appraisal of the behavioral immune system as an explanation of prejudice against ethnic outgroups. *Frontiers in Psychology, 10*, 2412. http://doi.org /10.3389/fpsyg.2019.02412

Lischke, A., Junge, M., Hamm, A. O., & Weymar, M. (2018). Enhanced processing of untrustworthiness in natural faces with neutral expressions. *Emotion*, *18*(2), 181–189. https://doi-org.trmproxy.mnpals.net/10.1037/emo0000318

LoCurto, J., & Berg, G. M. (2016). Trust in healthcare settings: Scale development, methods, and preliminary determinants. *SAGE open medicine*, *4*, 2050312116664224. https://doi.org/10.1177/2050312116664224

Ma, D. S., Correll, J., & Wittenbrink, B. (2015). The Chicago Face Database: A Free Stimulus Set of Faces and Norming Data. *Behavior Research Methods, 47*(4), 1122-1135.

Malcolm, G. L., Lanyon, L. J., Fugard, A. J. B., & Barton, J. J. S. (2008). Scan patterns during the processing of facial expression versus identity: An exploration of task-driven and stimulus-driven effects. *Journal of Vision*, *8*(8), 1–9. https://doi-org.trmproxy.mnpals.net/10.1167/8.8.2

Marler, H., & Ditton, A. (2020). "I'm smiling back at you": Exploring the impact of mask wearing on communication in healthcare. *International Journal of Language & Communication Disorders, 56*(1), 205-214. http://dx.doi.org.10.1111/1460-6984.12578

Matsumoto, D., & Hwang, H. (2018). Isolating cues to social judgements from faces: The possible effects of hairstyles. *Asian Journal of Social Psychology,* 21(4), 256-262. http://doi.org/10.1111/ ajsp.12331

Maurer, D., Le Grand, R., & Mondloch, C. J. (2002). The many faces of configural processing. *Trends in Cognitive Sciences*, *6*(6), 255–260. https://doi-org.trmproxy.mnpals.net/10.1016/S1364-6613(02)01903-4

Mehoudar, E., Arizpe, J., Baker, C. I., & Yovel, G. (2014). Faces in the eye of the beholder: Unique and stable eye scanning patterns of individual observers. *Journal of Vision*, *14*(7), 1-11. 10.1167/14.7.6

Murphy, J., Gray, K. L. H., & Cook, R. (2020). Inverted faces benefit from whole-face processing. *Cognition*, *194*. https://doi-org.trmproxy.mnpals.net/10.1016/j.cognition.2019.104105

Myers, D. G. & Twenge, J. M. (2017). Social psychology (12th Ed.). New York: McGraw-Hill.

Nelson, N. L., & Mondloch, C. J. (2017). Adults' and children's perception of facial expressions is influenced by body postures even for dynamic stimuli. *Visual Cognition*, *25*(4–6), 563–574. https://doi-org.trmproxy.mnpals.net/10.1080/13506285.2017.1301615

Oliveira, M. & Garcia-Marques, T. (2022). The effect of facial occlusion on facial impressions of trustworthiness and dominance. *Memory & Cognition, 50*(6) 1131-1146. 10.3758/s13421-022-01316-z

Olivera-La Rosa, A., Chuquichambi, E., & Ingram, G. (2020). Keep your (social) distance: Pathogen concerns and social perception in the time of COVID-19. *Personality and Individual Differences, 166*(Nov 1), 110200. http://dx.doi.org/10.1016/j.paid.2020.110200

Olszanowski, M., Kaminska, O. K., & Winkielman, P. (2018). Mixed matters: fluency impacts trust ratings when faces range on valence but not on motivational implications. *Cognition & Emotion, 32*(5), 1032–1051. https://doi-org.trmproxy.mnpals.net/10.1080/02699931.2017.1386622

Oosterhof, N. N., & Todorov, A. (2008). The functional basis of face evaluation. *Proceedings of the National Academy of Sciences of the United States of America, 105*(32), 11087–11092. https://doi-org.trmproxy.mnpals.net/10.1073/pnas.0805664105

Oruc, I., Balas, B. & Landy, M. S. (2019). Face perception: A brief journey through recent discoveries and current directions. *Vision Research, 157*(2019) 1-9. 10.1016/j.visres.2019.06.005

Payne, K. (n.d.) Research Materials. Accessed October 16, 2023 from https://bkpayne.web.unc.edu/research-materials/

Payne, K., & Lundberg, K. (2014). The Affect Misattribution Procedure: Ten Years of Evidence on Reliability, Validity, and Mechanisms. *Social & Personality Psychology Compass*, *8*(12), 672–686. https://doi-org.trmproxy.mnpals.net/10.1111/spc3.12148

Peterson, M. F., Lin, J., Zaun, I., & Kanwisher, N. (2016). Individual differences in face-looking behavior generalize from the lab to the world. *Journal of Vision*, *16*(7). https://doi-org.trmproxy.mnpals.net/10.1167/16.7.12

Peterson, M. F., & Eckstein, M. P. (2012). Looking just below the eyes is optimal across face recognition tasks. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 109*(48), E3314–E3323. https://doi-org.trmproxy.mnpals.net/10.1073/pnas.1214269109

Petrican, R., Todorov, A., & Grady, C. (2014). Personality at Face Value: Facial Appearance Predicts Self and Other Personality Judgments among Strangers and Spouses. *Journal of Nonverbal Behavior*, *38*(2), 259–277. https://doi-org.trmproxy.mnpals.net/10.1007/s10919-014-0175-3

Psalta, L., Young, A. W., Thompson, P., & Andrews, T. J. (2014). Orientation-sensitivity to facial features explains the Thatcher illusion. *Journal of Vision*, *14*(12). 10.1167/14.12.9

Qi, Y. & Ying, J. (2022). Gender Biases in the Accuracy of Facial Judgments: Facial Attractiveness and Perceived Socioeconomic Status. *Frontiers in Psychology 13*(Article 884888). https://doi.org/10.3389/fpsyg.2022.884888

Quadflieg, S., Todorov, A., Laguesse, R., & Rossion, B. (2012) Normal face-based judgements of social characteristics despite severely impaired holistic face processing. *Visual Cognition 20*(8), 865-882. http://dx.doi.org/10.1080/13506285.2012.707155

Sagliano, L., D'Olimpio, F., Taglialatela Scafati, I., & Trojano, L. (2016). Eye movements reveal mechanisms underlying attentional biases towards threat. *Cognition & Emotion, 30*(7), 1344–1351. https://doi-org.trmproxy.mnpals.net/10.1080/02699931.2015.1055712

Schneider, P., Vergauwe, E., & Camos, V. (2024). The visual familiarity effect on attentional working memory maintenance. *Memory & Cognition*. https://doi-org.trmproxy.mnpals.net/10.3758/s13421-024-01548-1

Schwartz, B. (2017, October 27). *Three Main Reasons Clinicians Fail Their Clients Pt. 1*. New Harbinger Publications. https://www.newharbinger.com/blog/professional/three-main-reasons-clinicians-fail-their-clients-pt-1/

Shen, X., & Ferguson, M. J. (2021). How resistant are implicit impressions of facial trustworthiness? When new evidence leads to durable updating. *Journal of Experimental Social Psychology, 97*(2021). https://doi-org.trmproxy.mnpals.net/10.1016/j.jesp.2021.104219

Sutherland, C. A. M., Burton, N. S., Wilmer, J. B., Blokland, G. A. M., Germine, L., Palermo, R., Collova, J. R. & Rhodes, G. (2020). Individual differences in trust evaluations are shaped mostly by environments, not genes. *Proceedings of the National Academy of Sciences of the United States of America, 117*(19) 44933. 10.1073/pnas.1920131117/-/DCSupplemental

Veres-Injac, B., & Schwaninger, A. (2009). The time course of processing external and internal features of unfamiliar faces. *Psychological Research*, *73*(1), 43–53. https://doi-org.trmproxy.mnpals.net/10.1007/s00426-008-0147-5

Wendling, J. M., Fabacher, T., Pébaÿ, P. P., Cosperec, I., & Rochoy, M. (2021). Experimental Efficacy of the Face Shield and the Mask against Emitted and Potentially Received Particles. *International journal of environmental research and public health*, *18*(4), 1942. https://doi.org/10.3390/ijerph18041942

Willis, J., & Todorov, A. (2006). First Impressions: Making Up Your Mind After a 100-Ms Exposure to a Face. *Psychological Science, 17*(7), 592–598. https://doi-org.trmproxy.mnpals.net/10.1111/j.1467-9280.2006.01750.x

Wilson, J. P., Young, S. G., Rule, N. O., & Hugenberg, K. (2017) Configural processing and social judgments: Face inversion particularly disrupts inferences of human-relevant traits.

Journal of Experimental Social Psychology 74(Jan), 1-7. https://doi.org/10.1016/j.jesp.2017.07.007

Young, D. G., Rasheed, H., Bleakley, A., & Langbaum, J. B. (2022). The politics of mask-wearing: Political preferences, reactance, and conflict aversion during COVID. *Social Science & Medicine*, *298*(114836), N.PAG. https://doi-org.trmproxy.mnpals.net/10.1016/j.socscimed.2022.114836

Yu, M., Muniba, S. & Gonzalez, C. (2014). Developing trust: First impressions and experience. *Journal of Economic Psychology, 43*(2014) 16-29. 10.1016/j.joep.2014.04.004

Table 4

Pairwise Comparisons

Rating Type	Trust Level	Visibility Level	*M*	*SD*	*M* Diff.	Visibility Level Compared	*M*	*SD*	*p*
Pleasantness	Low	Plain	2.47	.09	.17	Bottom Open	2.31	.09	1.000
					.17	Top Visible	2.31	.09	.750
	High	Plain	2.82	.08	.25	Masked	2.57	.10	.043
					.40	Bottom Open	2.41	.10	.007
					.30	Top Visible	2.51	.08	.014
Valence	Low	Masked	2.04	.10	.15	Top Visible	1.89	.08	.046
	High	Plain	2.68	.12	.41	Bottom Open	2.27	.11	.004
					.23	Top Visible	2.44	.10	.015
					.29	Inverted	2.39	.12	.003
		Masked	2.59	.12	.32	Bottom Open	2.27	.11	.012
					.20	Inverted	2.39	.12	.047
Domi-nance	Low	Plain	3.00	.09	.31	Bottom Open	2.68	.10	
	Interaction between factors was not significant, $p > .05$								
	High	Plain	2.35	.11	.10	Bottom Open	2.24	.11	
Interaction between factors was not significant, $p > .05$									
Trustworthiness	Low								
	High	Plain	2.58	.12	.16	Masked	2.43	.14	.036
					.47	Bottom Open	2.12	.12	.000
					.22	Inverted	2.36	.13	.017
		Masked	2.43	.14	.31	Bottom Open	2.12	.12	.010
		Top Visible	2.39	.13	.27	Bottom Open	2.12	.12	.007

Figure 1

Implicit Pleasantness

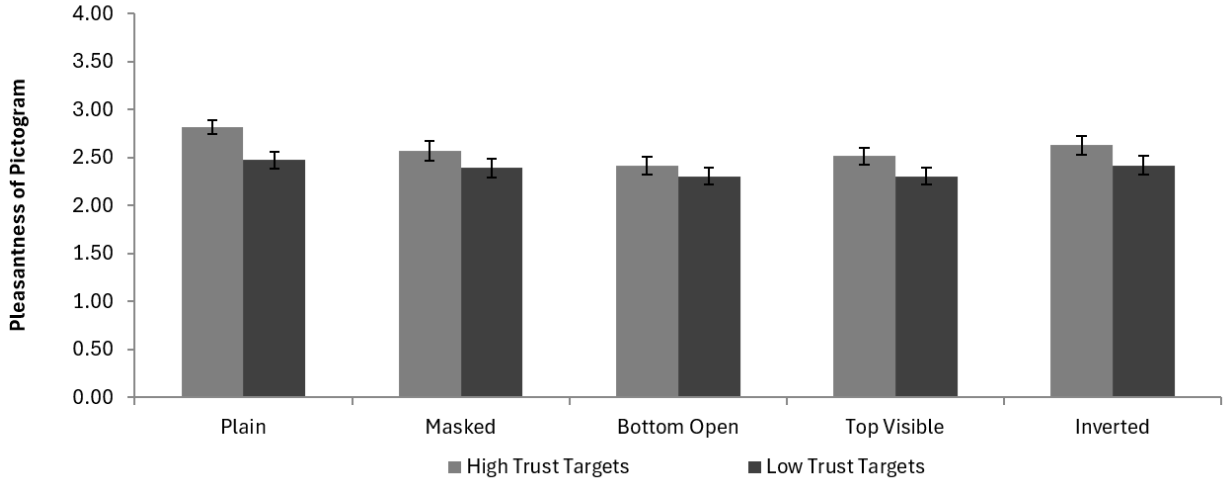


Figure 2

Explicit Valence

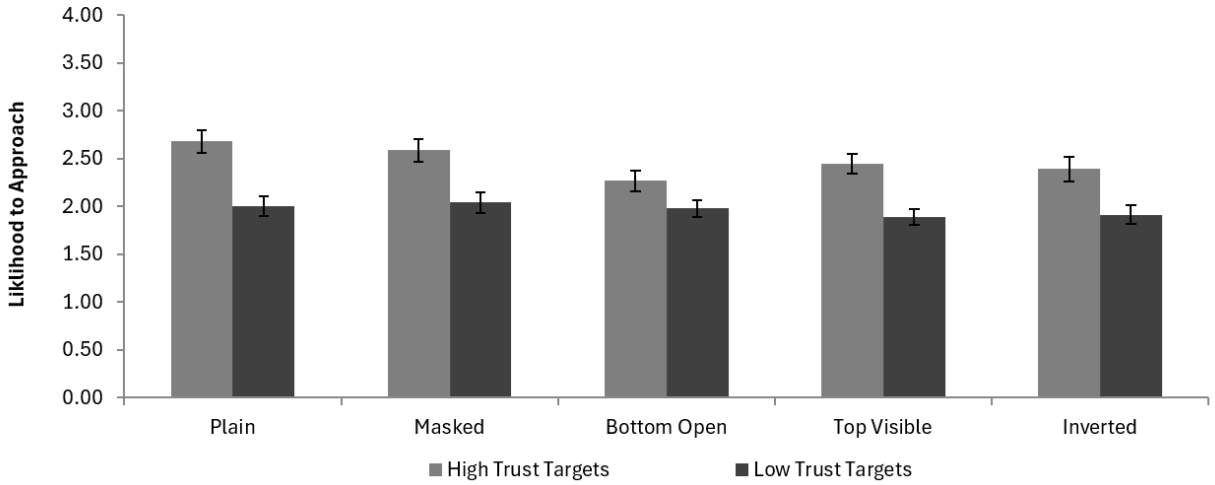


Figure 3

Explicit Dominance

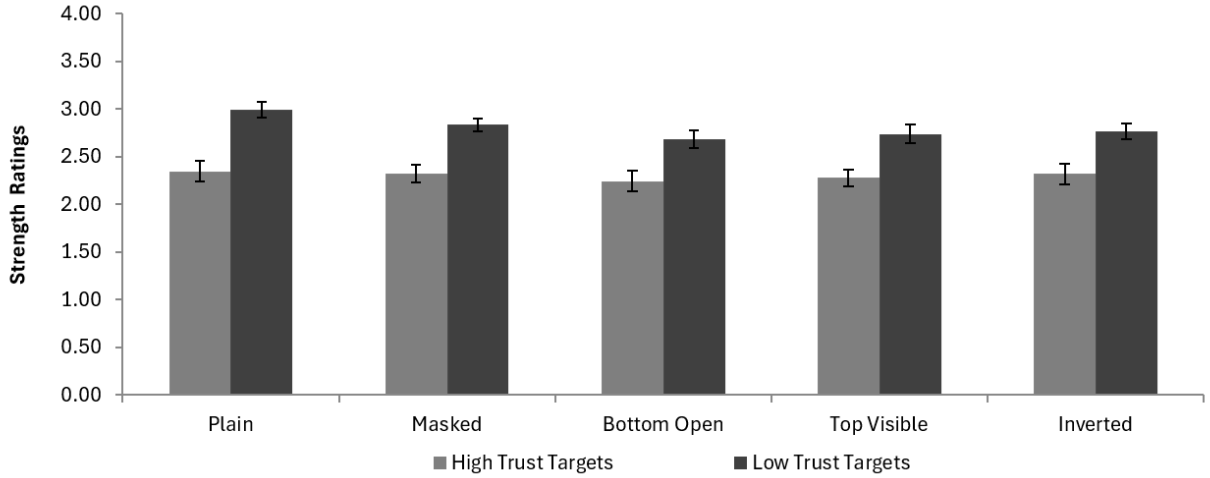
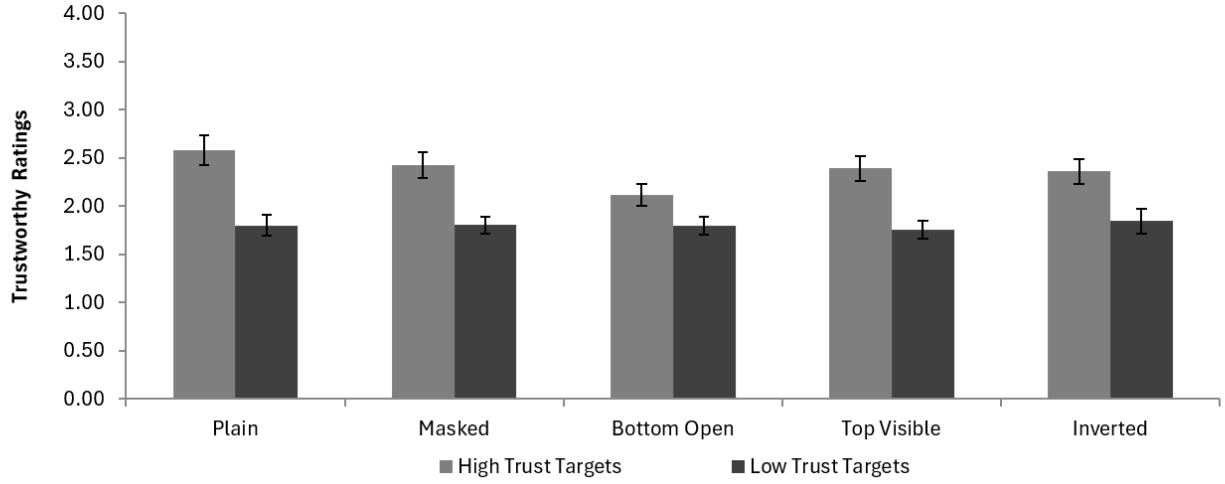


Figure 4

Explicit Trustworthiness



Appendix A

Institutional Review Board

MINNESOTA STATE UNIVERSITY MOORHEAD

DATE:	February 20, 2024
TO:	Jessica Brown, Principal Investigator Linsey Culkins, Co-investigator
FROM:	Dr. Robert Nava, Chair Minnesota State University Moorhead IRB
ACTION:	**APPROVED**
PROJECT TITLE:	[2161922-1] Trust Judgements of Facial Stimuli
SUBMISSION TYPE:	New Project
APPROVAL DATE:	February 20, 2024
EXPIRATION DATE:	
REVIEW TYPE:	Expedited Review

Thank you for your submission of New Project materials for this project. The Minnesota State University Moorhead IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a project design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to the Minnesota State University Moorhead IRB. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the Minnesota State University Moorhead IRB.

This project has been determined to be a project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of .

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact the Minnesota State University Moorhead IRB. Please include your project title and reference number in all correspondence with this committee.

This letter has been issued in accordance with all applicable regulations, and a copy is retained within Minnesota State University Moorhead's records.

Appendix B

Table 1

Trustworthy Target Stimuli

Note: Target stimuli ratings for trustworthiness ranged between 3.77 and 3.92 (Ma et al., 2015).

Appendix C

Table 2

Untrustworthy Target Stimuli

Note: Target stimuli ratings for trustworthiness ranged between 2.31 and 2.70 (Ma et al., 2015).

Appendix D

Table 3

Pictograph Stimuli

感
也
尸
雨
令
百
它
弹
羊

Note: Pictographs depicted here are a sampling of 200 distinct pictographs (Payne, n.d.).