DOES THE APPLICANT'S EYE GAZE AFFECT INTERVIEW OUTCOMES IN VIRTUAL JOB INTERVIEWS?

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DEDICATION

To my beloved parents, Jeonghwa Lim and Changkyu Jang, I gratefully dedicate this thesis. I am very grateful that they have always believed in me and supported me with endless love.

ABSTRACT

Video-mediated communication has enabled people to communicate over long distances at a low cost. Despite the technical advances, video-mediated communication systems still have challenges, such as a lack of eye contact. Eye contact is considered an essential element in job interviews. It has been shown that the absence of eye contact affects interview outcomes in face-to-face interviews. However, research on the effects of eye contact in video-mediated job interviews is limited. The current study explores whether an applicant's eye direction affects the interviewer's perceived eye contact and how the interviewer's ratings of applicants vary based on the perceived eye contact affected by the applicant's eye direction in a video-mediated job interview. We expect findings to contribute to the growing body of knowledge regarding the effect of eye direction and eye contact in video-mediated job interviews. Potential job candidates may use the findings from this study as a guide to improving their chances of success in job interviews.

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I. INTRODUCTION

Video-mediated communication, a relatively new form of human communication, has become increasingly popular. Its development was affected by improved technology and increased demands for real-time communication across greater distances. In addition, the COVID-19 pandemic made the use of video-mediated communication no longer optional but necessary, and its use in business skyrocketed (Alexander, 2020). Many businesses started to operate remote work systems, followed by video-mediated job interviews. In a survey by OfficeTeam, it was discovered that 63% of HR managers have recently used video interviewing for their hiring process (Ryan, 2020). According to a survey conducted by Indeed, 82% of 1,100 U.S. employers incorporated virtual interviews during the pandemic, and approximately 93% indicated intentions to keep using virtual interviews (Maurer, 2021).

However, despite this increasing popularity of video-mediated communication, it has revealed essential elements of human interaction that should be considered when developing new applications afforded by ever-advancing technology (Bohannon et al., 2013). To be specific, despite these large technical advances and increased uses, video-mediated communication still does not provide the same experience as face-to-face communication. One of the major unresolved issues in video-mediated communication is the potential for missing eye contact (Jaklič et al., 2017).

Eye contact has been considered a critical element in job interviews (Kleinke, 1986). Indeed, several studies have demonstrated how eye contact and the direction of eye gazing affect an interviewer's evaluation in a face-to-face interview (Amalfitano & Kalt, 1977; Stass

& Willis, 1967; Tankard, 1970). Empirical research, however, has not yet examined the effects of eye contact in a video-mediated job interview. The potential for the absence of eye contact in video-mediated interviews may present a new challenge to job seekers. Thus, the current study explores the experience of eye contact in a video-mediated job interview by manipulating eye direction.

II. LITERATURE REVIEW

Nonverbal Communication

Nonverbal communication refers to a type of communication affected by means other than verbal elements, such as gestures, posture, facial expressions, and eye behavior. Nonverbal systems operate with verbal systems together as a part of larger communication (Knapp et al., 2013). According to Argyle (1975), nonverbal behaviors serve primary functions in human communication through various means. These include expressing emotions, conveying interpersonal attitudes such as likability and dominance, presenting one's personality to others, and accompanying speech for purposes such as managing turn-taking, providing feedback, and gaining attention.

According to a study by Ganguly (2017), nonverbal communication plays a vital role in a specific context, such as a selection interview process, as the most reliable and robust form of communication. Understanding nonverbal cues along with their meanings helps the applicants to present themselves as expected by the interviewers. Indeed, body language can have a significant impact on how the interviewee is perceived. Most importantly, maintaining proper eye contact with all the interviewers during the interview is critical.

Forbes & Jackson (1980) showed that a candidate's nonverbal behaviors themselves play a role as a cue for forming an interviewer's judgments. To be specific, it was found that accepted interviews are characterized by more direct eye contact, more smiling, and more nodding, which are interpreted as showing interest in the interviewers and acting as positive reinforcements. In contrast, more avoidance gaze, eye wandering, more neutral facial expressions, less smiling, and head static commonly occur in rejected interviews since these behaviors are interpreted as a lack of interest and enthusiasm on the part of the candidate.

Eye Contact

Human communication is complex, with a combination of verbal and nonverbal cues to exchange information. One of the most important nonverbal cues in communication is eye contact (Bohannon et al., 2013). Eye contact significantly affects human social interactions. Gaze can be defined as directed looking at any person or direction (Argyle & Cook, 1976). Mutual gazing refers to two people gazing at each other's eyes or faces. Eye contact is a gaze directed at another's eye, and mutual eye contact occurs when two people make eye contact simultaneously (Kleinke, 1986).

Furthermore, people are very sensitive to detecting the other person's eye gaze and are able to determine very accurately if somebody is actually looking at them. People respond very sensitively to catching someone's gaze directed toward them. People tend to react rapidly to the gaze directions of others, often without awareness, and this sensitivity to eye contact is inherent (Rothkirch, 2015). Farroni et al. (2002) demonstrated that attention to direct eye contact comes from birth. Even in the first year of life, infants respond sensitively to direct eye gaze and prefer to look longer and more frequently at other people's direct eye gaze.

This sensitivity to gaze, especially eye contact, continues into adulthood, and sensitivity to gaze develops more strongly over time. Jaspars et al. (1973) demonstrated that human adults could distinguish eye shifts of 1 cm at a distance of 100 cm, equivalent to a change of 5 degrees. Gibson & Pick (1963) also found that participants, even at a distance of 2 m from another person facing them, could detect an angular displacement of the eyeball, even if it was less than 3 degrees. Additionally, Kendon (1967) found that people tend to sensitively adjust their gaze based on the gazes of their conversational partners and spend

approximately the same amount of time engaged in eye gazing while responding to others' gazes.

Mutual gaze in our social interactions serves several functions. While we rely on many nonverbal cues to convey information to others, eye contact plays a discernible role in communication (Bohannon et al., 2013). Argyle (1972) described the functions of eye contact within different contexts, providing information about emotions, dominance, regulating interaction (such as notifying turn-taking cues), expressing intimacy, exercising social control (like attempting to be persuasive and deceptive), and facilitating task goals (such as fostering cooperation).

Kendon (1967) also suggested four general functions of eye contact: (a) cognitive – subjects tend to look away from difficult encoding points; (b) monitoring – subjects may look at their interactant to indicate the conclusions of thought units and to check their interactant's attentiveness and reaction; (c) regulatory – responses may be demanded or suppressed by looking; (d) expressive – the degree of involvement or arousal may be signaled through looking. Anderson & Shackleton (1990) also demonstrated that eye contact plays an important role in job interviews; most selected applicants displayed more eye contact during the job interview than non-accepted applicants.

Interestingly, different cultures have different meanings for using eye contact. According to Akechi et al. (2013), Eastern Asian individuals assess the direct gaze face as more unapproachable and unpleasant than Western European individuals. To be specific, Eastern Asian individuals rate the direct gaze faces as angrier and more dominant than Western European individuals. Additionally, Eastern Asian individuals evaluate direct gaze faces as angrier and sadder than when viewing averted gaze faces. The study explained these

cultural variations in using eye contact are due to differences in culturally defined rules of display of eye contact.

Kanayama (1977) also demonstrated that Japanese and Americans have different levels of acceptable eye contact and different rules for when it should occur. In Japanese culture, the gaze is very slight, especially when conversing with a superior. Kobayashi (1982) described it with the phenomenon of a hierarchical society: people of lower status always have to behave modestly, which is shown by averting their gaze and looking down. While the Japanese avoid eye contact to not be disrespectful, Americans interpret their lack of eye contact as a lack of attention or expression of negative opinions (Nixon & West, 1987).

In American culture, a lack of eye contact means dishonesty, insincerity, and impoliteness because making eye contact is often used as a signal to open communication and signify the need for feedback. In this regard, in American culture, avoiding eye contact can be interpreted as a signal of distrust, suspicion, or lack of interest (Phutela, 2015). Hattori (1987) found that Japanese people who had lived in the United States for at least two years and used English to communicate with their friends tended to gaze more than Japanese who did not have foreign experiences in the United States. It was interpreted that the bicultural and bilingual Japanese reported getting used to looking at others while having conversations since they are aware that maintaining eye contact is considered natural while carrying on a conversation in the United States.

Eye Contact in Employment Interviews

Even though eye contact holds different meanings based on different contexts and cultures, in general, eye contact makes interpersonal communication much richer and more efficient (Bohannon et al., 2013). In particular, eye contact has been repeatedly found to exert

a powerful influence on a variety of aspects of job interview performance, including likability, perceived intelligence, and actual hiring decisions.

Likability.

A growing body of literature suggests the importance of eye contact in interviews. Several studies have indicated that people use gaze as a sign of liking and attraction when observing social interactions. Scherer (1974) demonstrated that research participants evaluated each other more favorably when the experimenter seated them facing each other to enable mutual gaze. Stass and Willis (1967) showed that participants tended to prefer another confederate who made direct eye contact, leading to the formation of positive first impressions. Specifically, they concluded that people are attracted to others who appear to be interested in them; eye contact signals whether others are interested in them, and people choose to work with a person who makes eye contact with them during their introduction. Other studies have explained the relationship between liking and eye gaze such that averted eye contact is experienced as disinterest or unpleasantness, interfering with liking and decreasing positive affective reactions to the other person in social interactions (Hietanen & Peltola, 2021; Schmitz et al., 2012).

Intelligence.

Several studies have attempted to document the relationship between eye contact and decision-making during simulated employment situations. Wheeler et al. (1979) reported how eye contact influences the perception of intelligence, as indicated by estimated Grade Point Average (GPA) during a videotaped simulated personnel interview. The amount of eye contact, estimated by duration and frequency of eye shifts, demonstrated a statistically significant relationship with perceived competence. Specifically, interviewees who exhibited

a greater extent of eye contact (longer durations and fewer shifts) were more likely to be evaluated as having a higher GPA than individuals who generally showed less eye contact during the interview (shorter durations and more shifts). This study also suggested a plausible explanation for how eye contact, coupled with few eye shifts, influences the perception of an applicant's intellectual competence during an interview, referring to Hiscock's (1975) finding that fewer eye shifts correlate with better cognitive functions.

Interviewer's Employment Decisions.

Tankard (1970) demonstrated that changes in the directions of applicants' eye contact, meaning changes from maintaining eye contact to a lack of it, influence the interviewer's impressions of applicants; when applicants maintain straight-eye gazing rather than looking downward, a higher salary is estimated. Amalfitano & Kalt (1977) also found that eye contact influences the interviewer's hiring decisions in a job interview. In this study, participants were presented with two photographs; one showed the applicant looking directly into the camera, and the other showed them looking downward compared to the camera position. Participants were instructed to evaluate the job applicants and decide whether to hire them. Participants were more inclined to choose applicants who made direct eye contact with the camera.

Eye Contact in Virtual Environments

The Difficulty of Establishment of Eye Gazing in Virtual Communication

Since the onset of the COVID-19 pandemic, the utilization of remote and hybrid work systems has surged. Even post-pandemic, many businesses continue to utilize remote and hybrid workforce arrangements (Forbes, 2021). Adapting to the shift from face-to-face to virtual interactions, numerous organizations have begun leveraging virtual communication

tools to facilitate remote work systems (Indeed, 2022). Influenced by advancements in technology and the growing need for real-time communication over extended distances, video-mediated communication has become not only increasingly popular but also an indispensable mode of human interaction (Bohannon et al., 2013).

In the realm of business, videoconferencing technology has gained widespread acceptance, particularly in job interviews. A recent survey conducted by Indeed revealed that 82% of 1,100 U.S. employers incorporated virtual interviews during the pandemic, and approximately 93% indicated intentions to keep using virtual interviews. Furthermore, a survey by recruiting software provider Jobvite found that 61% of recruiters envisage the evolution of the hiring process to incorporate a combination of virtual and in-person procedures, while 22% plan to conduct virtual hiring processes exclusively (Maurer, 2021).

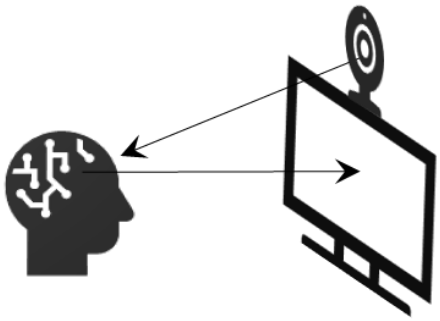
Eye contact plays a vital role not only in face-to-face communication but also in virtual communication. Consequently, preserving eye contact is critical to realistically imitating real-world communication in video-mediated communication systems. However, perceiving eye contact can be challenging in existing video communication systems, which can limit their effectiveness (He, Xiong, & Xia, 2021). The experience of eye contact in virtual communication is quite different from face-to-face communication. One of the challenges in video communication is the difficulty in establishing and maintaining eye contact among participants. This issue may have a widespread impact on communication (Jaklič et al., 2017).

Several studies have explored the problem of establishing eye contact in video-mediated communication. Bohannon et al. (2013) discussed the challenges of having eye contact in video-mediated communication, emphasizing the effects of the geometry of video-

mediated communication on the perception of eye contact. An example of this parallax is illustrated in Figure 1. It was described that current video-conferencing technology is designed such that a camera sits atop a screen. In this configuration, the image of the conversation partner is displayed on the screen while the camera captures the participant's face from above. As a result, it may appear to the participant that their conversation partner is looking downward, whereas, in reality, they are looking directly at the partner's eyes on the screen. This discrepancy between the camera's perspective and the direction in which a person is gazing is commonly perceived as a lack of eye contact in video-mediated communication.

He, Xiong, & Xia (2021) also discussed the challenge of missing eye contact as one of the limitations of virtual communication, highlighting the disparity between the camera's position and the position of the eyes on the screen. The researchers conducted experiments to investigate the perception of horizontal gaze direction within desktop video-mediated communication systems. In one condition, the camera was positioned directly above the image of the person, while in another condition, the camera was offset. When the camera was situated directly above the participant's face, gaze direction could be estimated with an accuracy of 84%. However, when the camera was not directly aligned with the person being gazed at, gaze estimation accuracy decreased to 67%. The study revealed that gaze direction perception accuracy decreases as the gaze deviates further from the central gaze position when the camera is directly above the image of the face. In conclusion, research demonstrates that a lack of eye contact often occurs in virtual communication due to the vertical disparity between the camera mounted on the monitor and the image of the other person's eyes.

Figure 1. Missing Eye Contact in Virtual Communication



Note. A typical situation of missing eye contact in video-mediated communication is when a camera mounted above the screen records a person, but the person is looking at the middle of a computer screen to look at another conversational partner. Since cameras are mounted above the computer screen, the eyes imaged on the other person's screen look downwards, thus establishing missing eye contact.

How to Solve the Issue of Eye Missing in Virtual Communication

Several studies have attempted to find practical solutions to enhance the experience of eye contact in virtual communication. He, Xiong, & Xia (2021) pointed out that while a vertical discrepancy often exists between the camera and the facial image in virtual communication, the issue of missing eye contact can be addressed by aligning the camera's position with the eyes' position. Chen (2002) discovered that mounting a camera above the screen results in a high sensitivity to eye gazing, leading to greater satisfaction in video-mediated communication. It was also noted that the extent of sensitivity varies depending on the direction of the gaze in video communication. Specifically, when individuals gaze upward, observers tend to be more attuned to eye contact compared to when individuals gaze below the screen. Jaklič et al. (2017) proposed that adjusting the gaze direction contributes to a better experience of eye contact in video-mediated communication. In an experiment, most

participants preferred images of people looking directly into the camera, considering it as showing better eye contact. It was demonstrated that if an observer tries to align their perceived gaze with the direction of the person in the picture by adjusting their gaze toward the person's gaze, the disparity between the two gaze directions decreases.

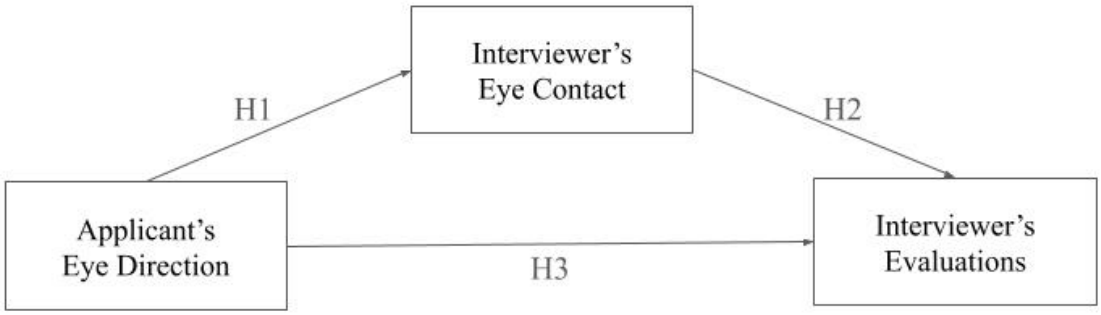
In summary, in virtual communication, one person's eye direction plays a crucial role in the other person's experience of eye contact, and the interviewer's experiences of eye contact influence their evaluation of applicants. However, most studies exploring the relationship between eye direction and eye contact in virtual communication have been conducted within the virtual conferencing setting. Similarly, most research on the relationship between the interviewer's eye contact experience and evaluations of applicants has primarily been conducted in face-to-face interview settings. It appears that additional studies investigating the effects of eye contact in virtual job interviews are needed. Therefore, this current study aims to explore whether eye direction impacts the experience of eye gazing, leading to better eye contact in virtual interviews and whether eye contact affects an interviewer's evaluations in a virtual interview setting. The current study examines the following hypotheses:

Hypothesis 1: When applicants gaze at the camera positioned above the monitor, interviewers experience a greater level of eye contact in a video-mediated interview as compared to when applicants gaze at the monitor.

Hypothesis 2: When interviewers experience a greater level of eye contact, they evaluate applicants more positively in a video-mediated interview.

Hypothesis 3: The interviewer's experience of eye contact mediates the relationship between the applicant's eye direction and the interviewer's evaluation of the applicant in a video-mediated interview.

Figure 2. Hypothesis Model



III. METHOD

Participants

A total of 194 participants (113 males, 79 females, and two individuals who selected ‘other’) were recruited from Prolific, an online platform that facilitates the recruitment of individuals for various tasks. Participants were paid $2.00 to complete the study. Their average age was 36.5 years (SD = 12.00). In terms of racial backgrounds, the breakdown was as follows: 132 identified as White, 22 as Hispanic/Latino, 14 as Asian, 12 as Black/African American, 2 as American Indian, 6 as belonging to multiple races, and 2 as 'other.' Regarding their previous experience as an interviewer, 102 participants reported having no previous experience as an interviewer, while 92 participants reported having prior interviewer experience. The range of previous experience as an interviewer varied widely, ranging from less than five interviews to more than a few hundred.

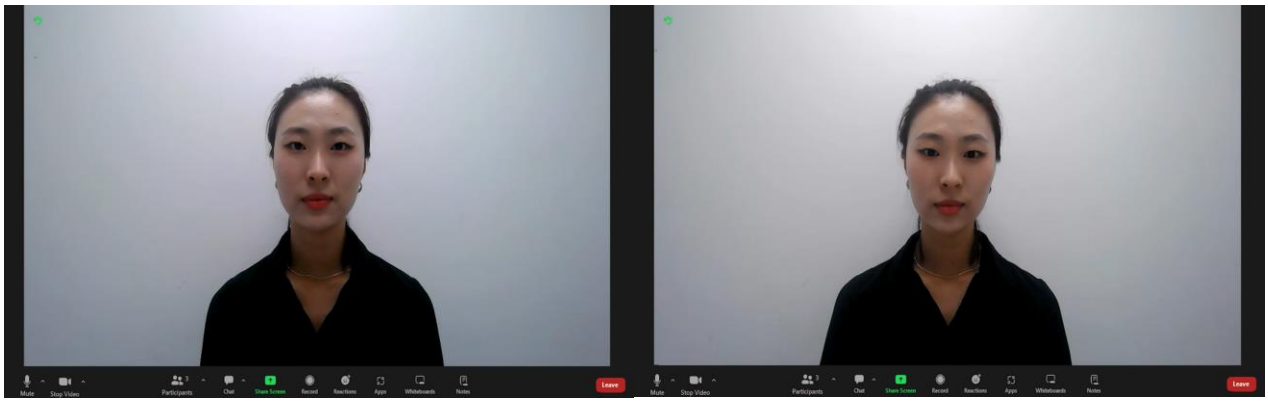
Procedure

Participants were randomly assigned to one of two conditions. In condition A (Camera Focus Condition), participants were asked to watch a virtual job interview video with an applicant who gazes at a camera above the monitor. In condition B (Monitor Focus Condition), participants were asked to watch a virtual job interview video with an applicant who gazes in the center of the monitor. After being assigned to one of the conditions, participants were asked to read a partial description of a job position for the interview obtained from ONET Online (n.d.).

Next, they were asked to watch a simulated interview video as if they were in the role of the interviewer. The interview videos were created with an adjusted script of an interview made by Howard and Ferris (1996). Both videos were recorded with the same actor within

the same environmental settings, such as the distance between the actor and the camera, posture, etc. Only the actor's eye direction was different, as shown in Figure 3. The actor underwent training to maintain appropriate eye direction for each condition and to deliver the interview script fluently while recording videos. Additionally, the video was designed to seem like one of the virtual communication platforms in order to help participants feel as if they were in real virtual job interview situations while watching the video. Immediately after watching the interview video, participants were asked to complete evaluation measures using Qualtrics for the last procedure of the study.

Figure 3. Applicant Images in Manipulated Eye Directions



Condition A **Condition B**

Note. Two videos were recorded for the two conditions: (a) looking into the camera positioned above the monitor and (b) looking into the center of the monitor.

Measures

Participants responded to questions regarding their experience of eye contact, ratings of the applicant, and demographic information: age, gender, race, and interviewer experience. There were also two attention-check questions to ensure that participants were paying attention.

Experienced eye contact. One item used by Jaklič et al. (2017) measured the extent of eye contact: “Please evaluate your experience of having eye contact during the interview.” Participants rated this item on a 5-Likert Scale (1 = *Very little*, 5 = *Very well*).

Interviewer Liking of Applicant. One item used by Cable & Judge (1997) measured how well participants liked the applicant: “Please estimate how well you personally liked this applicant.” Participants rated this item on a 5-point Likert scale (1 = *Very little*, 5 = *Very well*).

Estimated Intelligence. Participants estimated the applicant's intelligence by estimating the applicant’s GPA: “How high is the estimated GPA (out of 4.0) that the interviewee would likely have?” (Wheeler et al., 1979).

Interviewer’s Hiring Decisions. Four items (Krumhuber, 2009; Tankard, 1970) measured participants’ hiring decisions. The first item asked participants to estimate the prospective salary that they would recommend offering to the applicant: “Indicate the starting annual wage you would be willing to pay this person on a 7-point Likert scale (1 = *$100,000*, 7 = *160,000*).” The second item asked participants to estimate how suitable for the position the applicant was on a 4-point Likert scale: “Please rate the applicant according to the following scale (1 = *Did not consider hiring*, 2 = *Considered for hire*, 3 = *Strongly considered for hire*, 4 = *Hired*)”. The third item asked participants to estimate the likelihood of inviting the applicant for further interview on a 7-point Likert scale: “How likely is it that this person would be short-listed for further interview (1 = *Not likely at all*, 7 = *Very likely*)”. The fourth item asked participants to estimate the likelihood of selecting the applicant for the position on a 7-point Likert scale: “How likely is it that this person would be selected for the position? (1 = *Not likely at all*, 7 = *Very likely*)”.

IV. RESULTS

Demographics

We found that age, gender, and race had no significant relationships with the other variables. However, in the condition where the applicant's eye direction was fixed on the monitor, a significant positive correlation was observed between interviewer experience and hiring decisions. Since this correlation was not observed in the condition where the applicant's eye direction was fixed on the web camera, we did not include interviewer experience in further analyses.

Correlation Analysis

A correlation analysis was used to determine whether the applicant's eye direction was related to the interviewer's experience of eye contact (See Table 1). This analysis revealed that there is a significant correlation between the applicant's eye direction and the interviewer's perceived eye contact (r = -.19, p = .01). This indicates that when an applicant gazes straight into a web camera above the monitor, interviewers experience better eye contact than when an applicant gazes at the center of the monitor. Thus, Hypothesis 1 was supported.

A correlation analysis was performed to examine whether the interviewer's experience of eye contact was related to their evaluations of the applicant. First, the relationships between the interviewer's experience of eye contact and applicant liking, estimated intelligence, and overall hiring decision were examined. For this analysis, salary, suitability, next interview, and selection for the position were aggregated into an overall hiring decision variable (See Table 1). This analysis indicated that the interviewer's perceived eye contact is significantly correlated with the interviewer's liking toward

applicants (r = .23, p < .001), estimated intelligence (r = .16, p = .03), and the interviewer's overall hiring decision (r = .27, p < .001).

Table 1
Correlations among Main Study Variables

		Eye Direction	Eye Contact	Likability	Estimated Intelligence	Hiring Decision
Eye Direction	Pearson's r	—				
	p-value	—				
Eye Contact	Pearson's r	-0.19	—			
	p-value	0.01	—			
Likability	Pearson's r	0.04	0.23	—		
	p-value	0.57	0.001	—		
Estimated Intelligence	Pearson's r	-0.11	0.16	0.17	—	
	p-value	0.14	0.03	0.02	—	
Hiring Decision	Pearson's r	-0.05	0.28	0.69	0.32	—
	p-value	0.46	< .001	< .001	< .001	—

Additionally, each individual item used for the interviewer's hiring decision was further examined in an exploratory correlation analysis (See Table 2). The following variables were significantly correlated with the interviewer's perceived eye contact: suitability for the position (r = .26, p <.001), likelihood of inviting the person for further interview (r = .023, p = .01), and likelihood of selecting the person for the position (r = .28, p <.001). There was no significant correlation, however, between the interviewer's perceived eye contact and the estimated salary (r = .13, p = .06). Overall, these findings provide support for Hypothesis 2.

Table 2
Correlations among Specific Hiring Decision Dimensions

		Eye Direction	Eye Contact	Estimated Salary	Suitability	Next Interview	Selection
Eye Direction	Pearson's r	—					
	p-value	—					
Eye Contact	Pearson's r	-0.19	—				
	p-value	0.01	—				
Estimated Salary	Pearson's r	-0.02	0.13	—			
	p-value	0.79	0.06	—			
Suitability	Pearson's r	-0.08	0.26	0.40	—		
	p-value	0.27	< .001	< .001	—		
NextInterview	Pearson's r	-0.07	0.22	0.33	0.70	—	
	p-value	0.35	0.002	< .001	< .001	—	
Selection	Pearson's r	0.00	0.29	0.40	0.82	0.71	—
	p-value	1.00	< .001	< .001	< .001	< .001	—

Mediation Analysis

A mediation analysis was performed in order to assess the mediating role of the interviewer's experience of eye contact on the linkage between the applicant's eye direction and the interviewer's evaluations of an applicant (See Tables 3-5). The results of this analysis revealed that there was no direct effect of the applicant's eye direction on the interviewer's evaluations, including likability, estimated intelligence, and hiring decisions. This means that there is no significant relationship between the applicant's eye direction and the interviewer's evaluations when considering only the direct relationship between the variables, without accounting for the interviewer's perceived eye contact. In other words, this finding suggests that the applicant's eye direction, by itself, does not significantly predict the interviewer's evaluation.

The results of this analysis also demonstrated that there was no direct effect, meaning

that even when considering the potential relationship of the variables with experienced eye contact, no significant direct relationship between the variables was found. However, as predicted by Hypothesis 3, the results of this analysis revealed significant indirect effects of the applicant's eye direction on the interviewer's evaluations through the interviewer's perceived eye contact. Specifically, significant indirect effects of applicant's eye direction on likability (β = -.096, p = .03, 95% CI [-.18, -.002]) and overall hiring decisions (β = -.12, p = .03, 95% CI [-.24, -.03]) were found. However, a linkage between the applicant's eye contact and estimated intelligence was not significantly mediated by the interviewer's perceived eye contact. Thus, Hypothesis 3 was partially supported.

Table 3
Mediator Effect on Likability

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.10	0.04	-0.18	-0.02	-2.33	0.02
Direct	C	0.19	0.14	-0.11	0.43	1.27	0.21
Total	c + a × b	0.08	0.15	-0.22	0.35	0.56	0.57

Table 4
Mediator Effect on Estimated Intelligence

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.01	0.01	-0.03	0.01	-1.51	0.13
Direct	C	-0.04	0.03	-0.10	0.03	-1.11	0.27
Total	c + a × b	-0.05	0.03	-0.11	0.01	-1.53	0.13

Table 5
Mediator Effect on Hiring Decisions

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.12	0.05	-0.24	-0.03	-2.24	0.03
Direct	C	0.01	0.16	-0.29	0.33	0.05	0.96

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Total	c + a × b	-0.11	0.16	-0.45	0.21	-0.69	0.49

Additionally, each individual variable used for the interviewer's overall hiring decision was analyzed with exploratory mediation analysis, and there were mixed results, as shown in Tables 6-9. This analysis indicated a significant mediation effect of the interviewer's perceived eye contact on the relationship between the applicant's eye direction and the likelihood of inviting a person to the further interview (β = - .12, p = .032, 95% CI [.25, -.02]), and the likelihood of selecting the person for the position (β = -.16, p = .02, 95% CI [-.30, -.05]). However, there was no significant mediation effect of the interviewer's perceived eye contact on the relationship between the applicant's suitability for the position and estimated salary.

Table 6
Mediator Effect on Estimated Salary

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.08	0.05	-0.20	-0.01	-1.59	0.11
Direct	C	0.02	0.23	-0.45	0.48	0.09	0.93
Total	c + a × b	-0.06	0.22	-0.52	0.38	-0.28	0.78

Table 7
Mediator Effect on Suitability

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.11	0.06	-0.25	-0.03	-1.93	0.05
Direct	C	-0.07	0.15	-0.41	0.20	-0.48	0.63
Total	c + a × b	-0.19	0.17	-0.54	0.12	-1.11	0.27

Table 8

Mediator Effect on Likelihood of Inviting the Applicant for Next Interviews

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.13	0.06	-0.25	-0.02	-2.15	0.03
Direct	C	-0.07	0.20	-0.48	0.33	-0.34	0.73
Total	c + a × b	-0.20	0.21	-0.61	0.23	-0.92	0.36

Table 9

Mediator Effect on Likelihood of Selecting the Applicant for the Position

				95% Confidence Interval			
Effect	**Label**	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**p**
Indirect	a × b	-0.16	0.07	-0.30	-0.05	-2.33	0.02
Direct	C	0.16	0.19	-0.21	0.54	0.83	0.42
Total	c + a × b	6.56e-8	0.20	-0.40	0.39	3.34e-7	1.00

V. DISCUSSION

The current study aimed to investigate the relationship between an applicant's eye direction, the interviewer's perceived eye contact, and the interviewer's evaluations of the applicant in a video-mediated job interview. As predicted in Hypothesis 1, our findings revealed that depending on the applicant's eye direction—either gazing at the camera above the monitor or the center of the monitor—interviewers experienced eye contact differently in video-mediated interviews. This finding aligns with a previous study conducted on eye gaze in virtual conferencing contexts, which indicated that individuals tend to perceive more eye contact when the person on video gazes directly at the camera as opposed to gazing at the center of the monitor (Jacklic, 2017).

As predicted in Hypothesis 2, the interviewer's perceived eye contact was significantly related to better evaluations of an applicant in a video-mediated interview. To be specific, interviewers tended to have a greater liking toward the applicant, make higher estimations of the applicant's intelligence, and even make more positive hiring decisions when they perceived greater eye contact. This finding is consistent with results found in research on traditional face-to-face interviews, which found that greater eye contact is positively related to such outcomes (Amalfitano & Kalt, 1977; Stass & Willis, 1967; Tankard, 1970).

As expected in Hypothesis 3, the current study found that the interviewer's perceived eye contact played a partial mediating role in the relationship between the applicant's eye direction and the interviewer's evaluation, including ratings of applicant likability and hiring decisions. However, it is noteworthy that the interviewer's perceived eye contact did not significantly mediate the interviewer's estimations of applicant intelligence. Thus,

Hypothesis 3 was partially supported. When the sub-items of the interviewer's evaluations were further examined with regard to the mediating effect of the interviewer's eye contact and evaluations, a significant mediation effect was found for the likelihood of inviting the applicant for a further interview and for the likelihood of selecting the application for the position, but no mediation effects were found for the interviewer's eye contact and estimated salary or applicant's suitability for the position.

The present study makes a unique theoretical contribution in two primary ways. First, the findings of the present study are consistent with the research on videoconferencing (Jacklic, 2017; Joiner et al., 2023). Thus, the present study adds to our understanding of video-mediated communication by expanding the basis of knowledge about the relationship between eye direction and eye contact. It demonstrates that the relationship found in videoconferencing studies between a person's eye direction and the other person's perceived eye contact also holds true in the setting of a video job interview.

Additionally, most previous research examining the effects of eye contact on interviewer evaluations has been conducted in the context of face-to-face job interviews (Amalfitano & Kalt, 1977). In this regard, the present study makes a unique contribution in terms of examining the communication mechanisms involved in video-mediated job interviews. The results of the present study demonstrated that the relationship between the interviewer's experience of eye contact and the interviewer's evaluations of an applicant are similarly related in video-mediated interviews as they are in face-to-face interviews. Eye contact, however, can be more challenging in video-mediated job interviews, as compared to face-to-face job interviews, due to the limitations of the location where a camera can be mounted. Each person in video-mediated job interviews is compelled to look at the other

person’s face, but that necessarily results in their own eye contact being diminished toward the other person. Thus, understanding the dynamics of the effects of eye contact is particularly important for video-mediated job interview settings. This study contributes to the growing body of knowledge about the role of an applicant’s eye direction in video-mediated interviews and perceived eye contact in video-mediated communication, which is an area of increasing importance as organizations increasingly use video-mediated communication platforms for the hiring process.

These theoretical contributions also yield two significant practical implications that can directly impact the real world. First, the present study holds potential implications for technology designers and developers seeking to enhance communication in virtual settings, prompting consideration of strategies to improve and optimize eye contact between participants. The findings emphasize the importance of user experience (UX) design in virtual communication platforms. To be specific, beyond the platform's specific purposes, this finding can be utilized to create interfaces that encourage relatively more natural eye contact, thereby enhancing the overall user experience and facilitating more effective virtual communication.

Most importantly, our findings expand the knowledge of video-mediated interviews and for job interview training. These findings can suggest guidance on how to enhance the likelihood of being selected for a position when an applicant participates in video-mediated interviews. For instance, based on the findings of the present study, it is recommended that candidates should gaze straight at the webcam rather than at the monitor in video-mediated job interviews. This can improve their likelihood of getting better evaluations overall, especially in terms of likability, being invited to a further interview, and the likelihood of

being selected for the position.

While the results of the present study make an important contribution, both theoretically and practically, it is essential to consider these findings in light of the limitations of the study. First, not all study participants had previous experience as an interviewer. This is relevant because, in the condition with the applicant gazing at the center of the monitor, participants without previous experience as an interviewer tended to make higher evaluations of the applicant than participants who have previous interviewer experience. Dipboye & Jackson (1999) noted that as interviewers have more experience in assessing candidates, they show improved quality of their judgments. In this regard, it is possible that if the participants were all interviewing experts (or at least had more experience interviewing), our study could reflect “less noisy” results without being impacted by some participants' previous (in)experience as an interviewer. Future research should examine this issue with samples with interviewer experience to get a more realistic impression of how experienced interviewers evaluate candidates in video-mediated interviews.

In addition, this study exhibits a biased race dispersion among participants, possibly limiting the generalizability of the results. Out of a total of 194 participants, 133 identified as white, comprising approximately 69% of the total participants. 22 participants indicated as Hispanic/Latino, 20 as Black/African American, 2 as American Indian, 4 as belonging to multiple races, and one as 'other.’ According to a survey by Turner et al. (2020), which examined demographic characteristics, it was found that 92% of the Prolific survey panel was white, while 4% of the panel was black, indicating that the Prolific has a survey panel pool lacking full representation of an evenly distributed demographic composition with a wide range of racial/ethnic diversity. It is possible that the skewed racial dispersion among

participants in this study is attributed to the features of the recruitment platform used. It may explain why this study found no correlations between race and other variables, in contrast to previous studies. According to Rand & Wexley (1975), raters are more likely to evaluate the interviewee's suitability and personal characteristics more positively when they perceive that the interviewees are similar to them. Additionally, Lin et al. (1992) found that similarity between interviewer and interviewee race significantly influences interview outcomes. It may be concluded that the overwhelming sample composition of white individuals attributed to the features of the recruitment platform, resulted in this study's failure to find a significant correlation between race and other variables. Moreover, there is a possibility that the biased racial distribution in this study could potentially confound the results. For future studies, therefore, it is recommended to include a broader range of races/ethnicities with larger samples within each group, either by utilizing the demographic prescreening function embedded in the platform or employing different data collection methods simultaneously.

Furthermore, the current study utilized recorded videos with pre-written scripts rather than conducting actual interviews. This experimental design did not allow participants to engage in direct interaction with applicants. Consequently, this limitation may have hindered interviewers' active engagement in the interviews. Interviews in a controlled experiment setting are likely to differ from real-world job interviews. According to Raza & Carpenter (1987), artificial interviewing situations may have limited generalizability compared to real ones. Thus, it is possible that the results of future studies conducted in actual interviewing environments will demonstrate better generalizability.

Moreover, since this study was conducted online, researchers were unable to directly observe whether participants paid attention while completing their tasks, particularly when

watching the interview video. To encourage participants to actively engage in their tasks, the study implemented a website function preventing participants from skipping the video until they had watched it in its entirety. However, although this study used the website setting, keeping participants from skipping the video without fully playing, it still could not ensure whether participants paid attention to watching the video. Also, this study used attention checks to estimate whether participants paid attention to the study while filling out a questionnaire. However, the attention checks questions (e.g., "Please select 'Yes' for this question.") could only confirm whether participants paid attention when filling out the questionnaire. Therefore, future research should use different attention check questions that specifically address the content of the video (e.g., 'What is the applicant's highest level of education in the video?') to verify participants' engagement with the video material. Additionally, informing participants that questions regarding the video content will be included can enhance their attentiveness.

Lastly, this study could not check if the perceived eye contact indeed reflected the existence of actual eye contact in video-mediated communication. It is possible that how people perceive eye contact and the actual presence of eye contact in the virtual setting are not the same, even though participants responded to their experiences of perceived eye contact. Thus, it is suggested that future studies should use eye-tracking data. This may help researchers to track the participants' eye gaze in accordance with the interviewee's eye gaze, making it possible to measure participants' experiences of eye contact more objectively.

Video-mediated communication has recently witnessed significant development, with many businesses adopting it as a new communication platform, especially for job interviews. While the use of video-mediated communication endeavors to duplicate the experience of

face-to-face communication as much as possible (Campbell, 1998), it still faces several technical limitations, most notably the challenge of facilitating eye contact (Bohannon et al., 2013). Given the important role of eye contact in a job interview, a lack of eye contact in video-mediated interviews is a serious concern (Burkhardt, 1985). Facilitating eye contact is considered a critical challenge that must be examined so that video-mediated communication can approach the rich interactions of face-to-face communication (Bohannon et al., 2013).

VI. REFERENCES

Akechi, H., Senju, A., Uibo, H., Kikuchi, Y., Hasegawa, T., & Hietanen, J. K. (2013). Attention to eye contact in the West and East: Autonomic responses and evaluative ratings. *PloS one, 8*(3), e59312.

Alexander, R. (2020). Locked-down digital work. *International Journal of Information Management*. DOI: https://doi. org/10.1016/j. ijinfomgt.

Amalfitano, J. G., & Kalt, N. C. (1977). Effects of eye contact on the evaluation of job applicants. *Journal of Employment Counseling, 14*(1), 46-48. https://doi.org/10.1002/j.2161-1920.1977.tb00637.x

Anderson, N. R., & Shackleton, V. J. (1990). Decision making in the graduate selection interview: A field study. *Journal of Occupational Psychology, 63*, 63-76.

Argyle, M. (1972). Non-verbal communication in human social interaction. In R. A. Hinde, Non-verbal communication. Cambridge U. Press.

Argyle, M. (1975). *Bodily communication*. International Universities Press.

Argyle, M., & Cook, M. (1976). *Gaze and mutual gaze*. Cambridge U Press.

Bohannon, L. S., Herbert, A. M., Pelz, J. B., & Rantanen, E. M. (2013). Eye contact and video-mediated communication: A review. *Displays*, *34*(2), 177-185. https://doi.org/10.1016/j.displa.2012.10.009

Burkhardt, J. C., Weider-Hatfield, D., & Hocking, J. E. (1985). Eye contact contrast effects in the employment interview. *Communication Research Reports, 2*(1).

Cable, D. M., & Judge, T. A. (1997). Interviewers' perceptions of person-organization fit and organizational selection decisions. *Journal of Applied Psychology*, *82*(4), 546.

Campbell, J.A., 1998. Participation in videoconferenced meetings: User disposition and meeting context. *Inform. Manage. 34*, 329–338

Chen, M. (2002, April). Leveraging the asymmetric sensitivity of eye contact for video conference. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 49-56). https://doi.org/10.1145/503376.503386

Dipboye, R. L., & Jackson, S. L. (1999). Interviewer experience and expertise effects. *The Employment Interview Handbook*, 259-278.

Farroni, T., Csibra, G., Simion, F., & Johnson, M. H. (2002). Eye contact detection in humans from birth. Proceedings of the National academy of sciences, 99(14), 9602-9605.

Forbes. (2021, October 20). *11 effective ways to support enhanced virtual communication*. https://www.forbes.com/sites/forbesbusinesscouncil/2021/10/20/11-effective-ways-to-support-enhanced-virtual-communication/?sh=26fb93b66e5e

Forbes, R. J., & Jackson, P. R. (1980). Non-verbal behaviour and the outcome of selection interviews. *Journal of Occupational Psychology*, *53*(1), 65-72.

Ganguly, S. (2017). Understanding Nonverbal Cues: A Key to Success in Interviews. IUP *Journal of Soft Skills*, *11*(2), 62-72.

Gibson, J. J., & Pick, A. D. (1963). Perception of another person's looking behavior. *The American Journal of Psychology*, *76*(3), 386-394. https://doi.org/10.2307/1419779

Hattori, T. (1987). A study of nonverbal intercultural communication between Japanese and Americans—Focusing on the use of the eyes. *Japan Association of Language Teachers Journal, 8,* 109-118.

He, M., Xiong, B., & Xia, K. (2021). Are you looking at me? Eye gazing in web video conferences. *Methods, 27,* 28-35.

Hietanen, J. K., & Peltola, M. J. (2021). The eye contact smile: The effects of sending and receiving a direct gaze. *Visual Cognition, 29*(7), 446-462.

Hiscock, M. C. (1975). *Some situational antecedents and dispositional correlates of lateral eye-movement direction* (Doctoral dissertation, ProQuest Information & Learning).

Howard, J. L., & Ferris, G. R. (1996). The employment interview context: Social and situational influences on interviewer decisions. *Journal of Applied Social Psychology, 26,* 112–136.

Human Resource Manager. (n.d.). ONET Online. https://www.onetonline.org/link/summary/11-3121.00

Indeed. (2022, July 22). What is Virtual Communication? (plus tips and tools). https://www.indeed.com/career-advice/career-development/what-is-virtual-communication

Jaklič, A., Solina, F., & Šajn, L. (2017). User interface for a better eye contact in videoconferencing. *Displays, 46,* 25-36. https://doi.org/10.1016/j.displa.2016.12.002

Jaspars, J., et al. (1973). Het ovserven van ogencontact. Nederlands Tijdschrijt voor de psychologie, 28, 67-81. [Cited in Baron-Cohen (1997)]

Joiner, R., Scanlon, E., O'Shea, T., Smith, R. B., & Blake, C. (2023, January). Evidence from a Series of Experiments on Videomediated Collaboration: Does Eye Contact Matter?. In *Computer Support for Collaborative Learning* (pp. 371-378). Routledge.

Kanayama, N. 1977. Hikaku Seikatsu Bunka Jiten - Nippon America Mexico.

Kendon, A. (1967). Some functions of gaze-direction in social interaction. *Acta Psychologica, 26,* 22-63.

Kleinke, C. L. (1986). Gaze and eye contact: A research review. *Psychological Bulletin, 100*(1), 78. https://doi.org/10.1037/0033-2909.100.1.78

Knapp, M. L., Hall, J. A., & Horgan, T. G. (2013). *Nonverbal communication in human interaction*. Cengage Learning.

Kobayashi, Y. (1982). Higengo Koudou no Hikaku. *Nichieigo Hikaku Kouza 5 - Bunka To Shakai*, 171-205. [Cited in Hattori (1987)]

Krumhuber, E., Manstead, A. S., Cosker, D., Marshall, D., & Rosin, P. L. (2009). Effects of dynamic attributes of smiles in human and synthetic faces: A simulated job interview setting. *Journal of Nonverbal Behavior, 33,* 1-15.

Lin, T. R., Dobbins, G. H., & Farh, J. L. (1992). A field study of race and age similarity effects on interview ratings in conventional and situational interviews. *Journal of Applied Psychology, 77*(3), 363.

Maurer, R. (2021). With virtual interviews here to stay, best practices are needed. *The Society for Human Resource Management*.

Nixon, J. C., & West, J. F. (1995). Intercultural preparation for managers going to Japan. *American Journal of Business, 10*(2), 57-64. https://doi.org/10.1108/19355181199500017

Phutela, D. (2015). The importance of non-verbal communication. *IUP Journal of Soft Skills, 9*(4), 43.

Scherer, S. E. (1974). Influence of proximity and eye contact on impression formation. *Perceptual and Motor Skills, 38*(2), 538. https://doi.org/10.2466/pms.1974.38.2.538

Schmitz, J., Scheel, C. N., Rigon, A., Gross, J. J., & Blechert, J. (2012). You don't like me, do you? Enhanced ERP responses to averted eye gaze in social anxiety. *Biological Psychology, 91*(2), 263-269.

Stass, J. W., & Willis, F. N. (1967). Eye contact, pupil dilation, and personal preference. *Psychonomic Science, 7*(10), 375-376. https://doi.org/10.3758/BF03331131

Rand, T. M., & Wexley, K. N. (1975). Demonstration of the effect 'similar to me' in simulated employment interviews. *Psychological Reports, 36*, 535-544.

Raza, S. M., & Carpenter, B. N. (1987). A model of hiring decisions in real employment interviews. *Journal of Applied Psychology*, *72*(4), 596.

Rothkirch, M., Madipakkam, A. R., Rehn, E., & Sterzer, P. (2015). Making eye contact without awareness. *Cognition*, *143*, 108-114.

Ryan, R. (2020, March 12). 7 tips on how to succeed in an online job interview. Forbes. https://www.forbes.com/sites/robinryan/2020/03/10/7-tips-on-how-to-succeed-in-an-online-job-interview/?sh=e58985353c73

Tankard Jr, J. W. (1970). Effects of eye position on person perception. *Perceptual and Motor Skills, 31*(3), 883-893. https://doi.org/10.2466/pms.1970.31.3.883

Turner, A. M., Engelsma, T., Taylor, J. O., Sharma, R. K., & Demiris, G. (2020). Recruiting older adult participants through crowdsourcing platforms: Mechanical Turk versus Prolific Academic. In *AMIA Annual Symposium Proceedings* (Vol. 2020, p. 1230). American Medical Informatics Association.

Wheeler, R. W., Baron, J. C., Michell, S., & Ginsburg, H. J. (1979). Eye contact and the perception of intelligence. *Bulletin of the Psychonomic Society, 13*(2), 101-102.

VII. APPENDIX

ANGELO STATE UNIVERSITY
College of Graduate Studies and Research
Institutional Review Board

08/28/2023

Dr. Cheryl Stenmark
Department of Psychology
Angelo State University
San Angelo, TX 76909

Dear Dr. Stenmark:

The project submitted to the IRB by you titled "*Nonverbal Factors that influence evaluation of applicants in video-mediated job interviews*" was reviewed and approved by Angelo State University's Institutional Review Board for the Protection of Human Research Subjects in accordance with federal regulations 45 CFR 46.

This protocol was approved on August 28, 2023. If the study will continue beyond one year, please submit a request for continuation no later than July 28, 2024 and allow sufficient time for review. Please note that any revisions to this protocol must be approved by the IRB prior to initiation. All unanticipated problems involving risks to subjects or others, and any unexpected adverse events must be reported promptly to this office.

The approval number for your protocol is #STE-082823. Please include this number in the subject line of in all future communications with the IRB regarding the protocol.

Sincerely,

David Bixler, Ph.D.
Interim Chair, Institutional Review Board

APPROVED
By ASU IRB at 1:28 pm, Aug 28, 2023

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