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Exploring Validity in Descriptive and Recorded Interviews of Japanese University Students

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Abstract

In this study, we analyzed the validity of descriptive interviews (admissions essays) and recorded interviews (admissions interviews), as well as the factors that influence interview assessments in Japanese university students. This investigation targeted participants enrolled in basic statistics courses at private universities in Japan and was conducted using descriptive (n = 89) and recorded (n = 16) mock interviews with respect to the same task. Our analysis found that the results for the descriptive mock interviews demonstrated high validity, affirming the value of incorporating admissions essays into traditional university admissions processes. By contrast, we did not obtain similarly valid results from recorded interviews, suggesting a potential influence of facial expressions on interview assessments. Our results can be used to improve the interview methods in admissions and prospective student selection.

Keywords: admission interview, admission essay, entrance examination, validity of assessment, facial expression

1 Introduction

In this study, we assess the types of interviews commonly used in entrance exams and the recruitment selection of prospective Japanese university students to assess their validity and factors influencing their interview assessments. In particular, we conducted interviews of students in an introductory course at Japanese universities, posing questions that are commonly encountered in entrance examinations and recruitment selection, such as those concerning motivations and future aspirations. We analyze the relationships between the responses and the factors that influence the assessments. We conducted the interviews in two comparable formats. The first involved conducting all questions and answers in descriptive form, which we refer to as a descriptive interview in this study. The descriptive interviews correspond to admissions essays in

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terms of entrance examinations and job application forms in recruitment. The other format involved oral questions and answers that were video recorded. The recorded interviews most closely resembled traditional face-to-face interviews; this approach has become increasingly common in corporate recruitment in Japan.

By conducting interviews with Japanese university students in both descriptive and recorded formats, we intend to elucidate the differences in characteristics in relation to the format of assessment results and the factors that influence assessments. This approach was taken to contribute to the design of future examination systems.

Several earlier studies have examined the validity of interviews that are the focus of this research. For instance, in medical and pharmaceutical education, assessments are conducted through a form of face-to-face interview for admissions referred to as the multiple mini interview (MMI). The relationship between these results and future performance has been investigated. The MMI involves multiple rounds of interviews in which candidates respond freely to short-form tasks. The value of the MMI has been examined: [1] concluded that MMI results predict first-year performance among medical students. [2] examined the relationship between the MMI and GPA in doctoral pharmacy students, finding a correlation. Various studies have obtained similar findings (e.g., [3]‐ [5]), indicating positive correlation between MMI and future academic performance. However, these studies primarily focus on specialized medical education, such as in medicine, pharmacy, and physical therapy. Investigations of general education subjects are scarce. Therefore, we seek more generalized results regarding the relationship between interview assessment and future academic performance, targeting subjects with larger numbers of participants, such as in introductory education at the university level.

In this study, we grouped interviews into two formats: descriptive and recorded. We analyzed the factors that influence these two formats' validity and their assessment. Because recorded interviews are a form of face-to-face interview, and preceding studies have identified differing levels of validity, particularly in the context of medical education. By contrast, less is known about the validity of descriptive interviews. For instance, [6] found that students who wrote essays with specific grammatical features had higher academic performance after admission. However, that study lacked essay assessment. Similarly, [7] showed that U.S. secondary school students who received guidance on writing admissions essays showed improved self-efficacy afterward. However, that study did not include an analysis of students' future performance assessments, failing to confirm the validity. As with face-to-face interviews, validity assessments for future performance have been conducted in medical education, including in descriptive interviews (e.g., [8]). However, we require more general results in the context of a broader array of subjects.

This review allowed us to identify the necessity of investigating both descriptive and recorded (face-to-face) formats of interviews in fields other than medical education. In doing so, we establish comparable conditions through unifying task content to evaluate the validity of the interviews.

In addition, we focused on facial expressions in the recorded interviews. As systematically discussed by [9], facial expressions can be cues for judging social characteristics and can serve as predictive factors for important social decision-making, such as in leader selection. Facial expressions in particular are known to be used in assessing abilities (e.g., [10], [11]), and judgments of intelligence according to facial expressions may be related to academic performance [12].

In this study, we also adopted the basic six facial expressions model, which is a representative framework in the field of facial expression research ([13], [14]). This model defines six basic facial expressions—anger, sadness, fear, disgust, joy, and surprise—that automatically evaluate specific input stimuli and elicit unique response packages as a result of psychological mecha-

nisms. Previous studies have demonstrated that these basic facial expressions are universal across cultures ([15],[16], [17]) and have been widely applied in various research fields, as exemplified in the cases mentioned above. Based on these prior findings, we incorporated facial expressions into the recorded interviews and examined their impact on evaluations.

This paper has four sections. Section 2 outlines the procedures following in conducting the mock interviews in this study and describes the surveys that were conducted. The main results are presented in Section 3, while Section 4 presents the conclusions and indicates future studies.

2 Method

Two mock interview studies were performed. The first focused on descriptive interviews, was conducted with 89 participants from April to July 2017. The second focused on recorded interviews, with 16 participants from May to August 2020. Both studies were conducted as part of a same basic statistics course at a private university in Japan. Table 1 presents details on the participants analyzed.

Table 1 shows a significant difference in the number of participants between the descriptive interview and the recorded interview. We attributed this discrepancy to two main factors. First, the data collection method differed between the two interview formats. For the descriptive interview, we recruited participants immediately after class and had them provide written responses on the spot, resulting in a high participation rate. In contrast, for the recorded interview, we recruited participants after class, scheduled their interviews for a later date, and then conducted them, leading to a lower number of participants. Second, the timing of data collection played a crucial role. The recorded interview was conducted during the early stages of the COVID-19 pandemic, when participants were not yet accustomed to online communication tools such as Zoom. This unfamiliarity with online formats likely discouraged participation, resulting in a smaller sample size for the recorded interview. Nevertheless, both interview formats targeted students from the same academic year who were enrolled in the same basic statistics course, and the distribution of achievement tests between the two periods showed no significant differences. Therefore, despite the difference in sample sizes, we concluded the participants in both interview formats to be comparable in terms of homogeneity.

Table 1: Participant Details and their Characteristics in the Analysis of Descriptive and Recorded Interviews.

	1st year	2nd year	3rd year	4th year	(Total)
Descriptive mock interviews	75	9	4	1	89
Recorded mock interviews	10	2	4	0	16
(Total)	85	11	8	1	105

We conducted the two surveys and assessments using the following procedures:

1. At the beginning of the basic statistics course, we administered a common pre-test for use in both the descriptive and recorded interviews. Because the basic statistics course was introductory for undergraduate students, the pre-test incorporated easy questions that could be answered by someone with a high school level of education.

2. We conducted mock interviews during the course period. Interview tasks focused on exploring the participants' reasons for taking the basic statistics course (hereafter referred to as their reason) and their motivation for future learning of statistics (hereafter referred to as their motivation). Participants submitted written responses for the descriptive mock interviews. and provided this information orally via online (Zoom) for the recorded mock interviews.

3. At the end of the course period, we conducted an achievement test. While the questions on the final exam differed between the participants who had the descriptive and recorded interviews, participants' performance was almost identical on similar types of questions.

We evaluated and analyzed the interviews using the following procedures:

4. Two evaluators assessed the descriptive and recorded interviews immediately after they were conducted. These evaluators were university faculty who had extensive experience in teaching statistics-related subjects, and they were not provided with information on the participants (such as their attitude during the course or their pre-test scores). Evaluators rated the responses regarding the participants' reason and motivation by the interviewees on a five-point scale. No rubric was provided for evaluation here.

5. For the recorded interviews, in addition to the assessments on a five-point scale, we performed facial expression analysis. We used the specialized software Affedex (Affectiva Inc.) to analyze the participants' facial expressions based on the movements of their facial muscles, measuring 10 types of emotion and 23 types of expression, as well as the intensity of expressions. In addition, we measured the valence of emotions, representing negative and positive emotions on a scale from −100 to +100. Here, Affdex uses deep learning, a type of AI technique, to determine facial expressions based on a dataset of over 9.9 million facial images collected from more than 90 countries. Specifically, raters trained according to the Facial Action Coding System (FACS, [18], [19]) evaluate participants' facial expressions, and these evaluations serve as training data. Deep learning algorithms analyze this training data to build a predictive model that estimates facial expression ratings based on facial action code data. Affdex applies this predictive model to encode unknown facial expressions and generate predicted values for facial expression and emotion assessments. As a result, the facial expression evaluations produced by Affdex are based on predictive values that assume raters from Western cultural contexts conducted the assessments. Therefore, the results may differ from those based on evaluations from Asian cultural contexts, such as Japan.

3 Results

3.1 Basic Results

In Table 2, we present the correlations among the results of assessment between the two evaluators for both descriptive and recorded interviews. These results indicated that the assessments of the two evaluators showed a moderate correlation for both the descriptive and recorded interviews, indicating general agreement. For subsequent analyses, we calculated the means for each of the two tasks (reason and motivation) and used them for common assessment results across the evaluators.

Table 2: Spearman Correlation of Assessment Results between Two Evaluators for Two Tasks

	Descriptive interviews	Recorded interviews
The “reason”	0.797	0.654
The “motivation”	0.595	0.495

We provide basic statistical measures regarding the participants’ performance and interview evaluations in Table 3. It is important to note here that the participants’ performance includes scores from a pre-test out of 15 points, an achievement test out of 100 points, and interview evaluations rated on a 5-point scale regarding the reason and the motivation, with the total interview assessment score resulting in the sum of the evaluations for the reason and the motivation. In addition, we present the distributions of pre-test scores for both descriptive and recorded interviews in Figure 1 and Figure 2, respectively. In addition, Figure 3 and Figure 4 present histograms of the final exam scores, while Figure 5 and Figure 6 present histograms of the comprehensive interview evaluation scores. No significant differences in distribution were observed between the histograms for the descriptive and recorded interviews.

We provide basic statistics on facial expressions obtained from the recorded interviews in Table 4. Likewise, we present a correlation matrix for these facial expression components in Table 5. It is worth noting that the values for anger, contempt, disgust, fear, joy, sadness, surprise, sentimentality, confusion, neutral engagement, and attention ranged from 0 to 100, while the valence ranged from −100 to 100.

Table 3: Basic Statistics on Participants' Grades and Interview Assessments

		Pre-test score	Achievement test score
Descriptive mock Interviews	Mean	10.101	74.438
	SD	3.123	15.345
Recorded mock interviews	Mean	9.563	77.500
	SD	2.874	20.575

		Assessment score for the "reason"	Assessment score for the "motivation"	Total interview assessment score
Descriptive mock interviews	Mean	3.034	3.056	6.090
	SD	0.869	0.810	1.598
Recorded mock interviews	Mean	3.438	3.438	6.875
	SD	0.704	0.512	1.118

Table 4: Basic Statistics for the Facial Expressions of the Participants (Recorded Interviews)

	Anger	Contempt	Disgust	Fear	Joy	Sadness	Surprise
Mean	2.374	0.539	0.575	0.833	10.027	0.439	0.996
SD	4.289	0.628	1.063	0.727	17.888	0.596	1.290

	Sentimentality	Confusion	Neutral	Engagement	Valence	Attention
Mean	1.314	3.616	83.426	39.316	9.897	97.136
SD	2.164	9.268	20.022	23.857	18.932	1.261

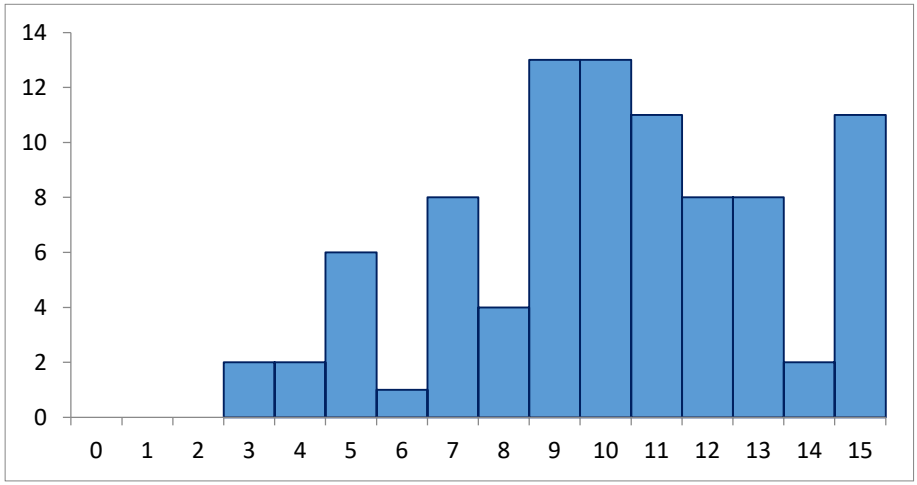

Figure 1: Distribution of Pre-test Scores (Descriptive Interview)

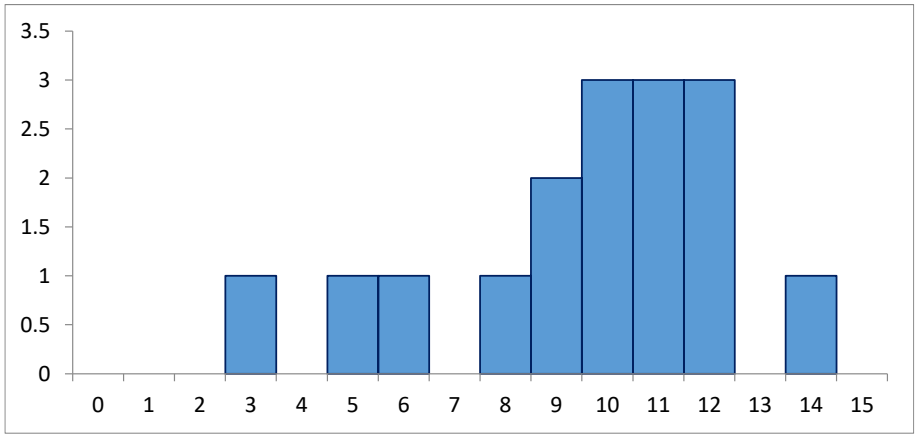

Figure 2: Distribution of Pre-test Scores (Recorded Interview)

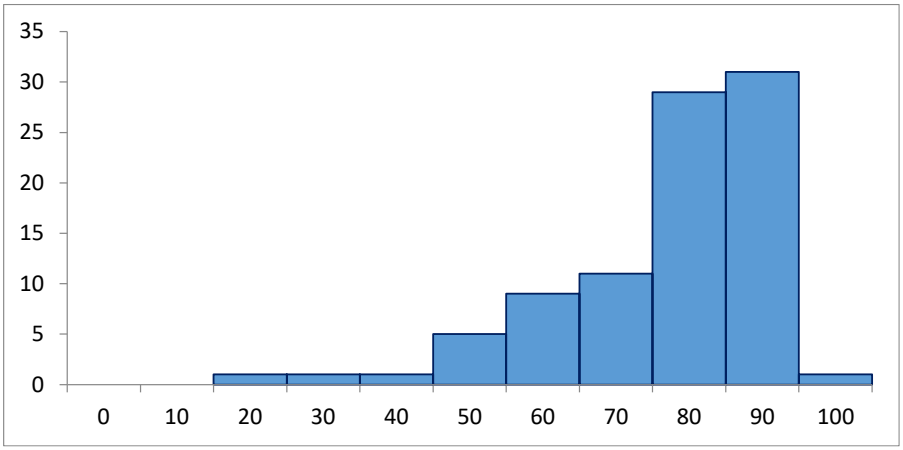

Figure 3: Distribution of Achievement Scores (Descriptive Interview)

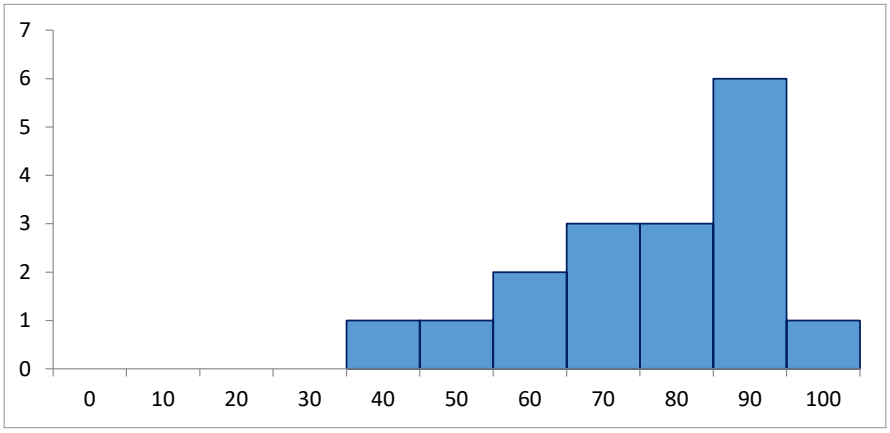

Figure 4: Distribution of Achievement Scores (Recorded Interview)

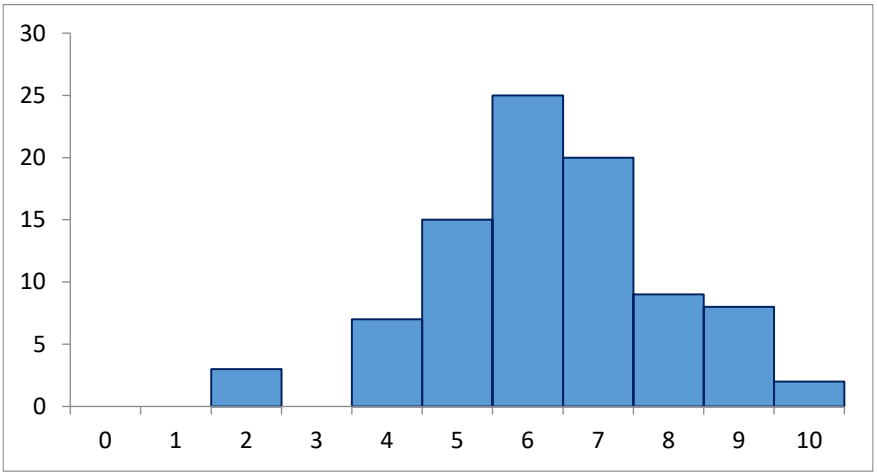

Figure 5: Distribution of Total Interview Assessment Scores (Descriptive Interview)

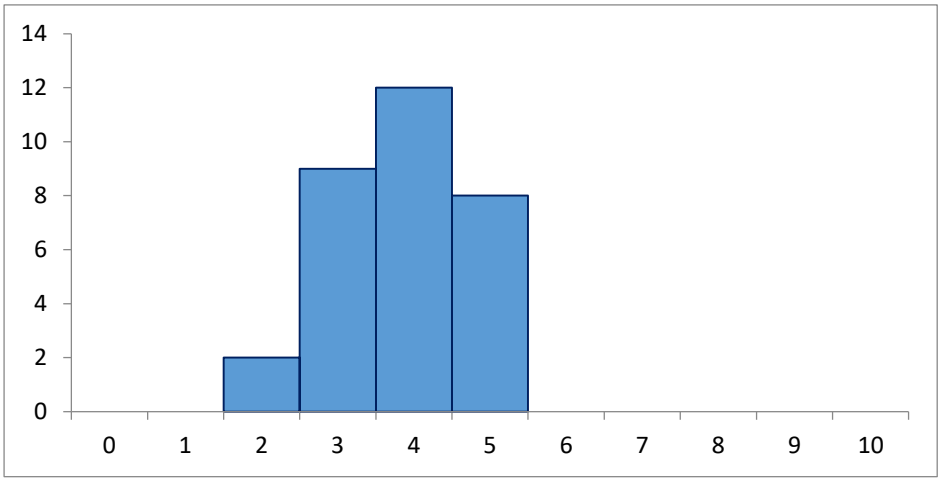

Figure 6: Distribution of Total Interview Assessment Scores (Recorded Interview)

Table 5: Correlation Matrix of Facial Expression Components (Recorded Interviews)

	Anger	Contempt	Disgust	Fear	Joy	Sadness	Surprise	Sentimentality	Confusion	Neutral	Engagement	Valence	Attention
Anger	1												
Contempt	0.153	1											
Disgust	0.063	-0.029	1										
Fear	0.733	0.178	0.117	1									
Joy	0.060	-0.142	-0.225	-0.231	1								
Sadness	0.559	0.326	0.011	0.697	-0.141	1							
Surprise	0.799	0.414	-0.074	0.823	0.116	0.660	1						
Sentimentality	0.434	0.493	-0.024	0.388	0.244	0.534	0.765	1					
Confusion	0.982	0.050	-0.031	0.687	0.128	0.541	0.782	0.442	1				
Neutral	-0.387	0.019	0.129	-0.074	-0.936	-0.111	-0.419	-0.433	-0.433	1			
Engagement	0.596	0.176	0.271	0.468	0.498	0.462	0.536	0.427	0.542	-0.704	1		
Valence	-0.095	-0.118	-0.208	-0.323	0.982	-0.224	0.022	0.225	-0.035	-0.874	0.429	1	
Attention	0.076	0.278	0.105	-0.259	0.058	-0.233	-0.041	0.158	0.030	-0.068	0.038	0.068	1

3.2 Main Results

3.2.1 Difference in the Total Assessment Score between Descriptive and Recorded Interviews

Figure 7 shows the difference in the sample mean for total assessment scores between the descriptive and recorded interviews. Using Welch's two-sample t-test, we found a statistically significant difference between the two total assessment scores ($t = -2.402$, $df = 27.415$, p-value = 0.023). Thus, our findings suggest the possibility that the targets measured in the descriptive and recorded interviews could be misaligned in this study, and henceforth, we treat these two interview formats separately.

3.2.2 Analysis of Factors Influencing Achievement Test Performance

Next, we analyzed the impact of the interview assessment and pre-tests on the achievement tests, which serve as indicators for educational effectiveness in the basic statistics subjects. Drawing on the results obtained in the previous section, we conducted separate analyses for the descriptive interviews and the recorded interviews. In addition, taking into account that the achievement test scores were discrete and often limited in range, we employed Poisson regression analysis in each case. We present the estimation results obtained from Poisson regression analysis for the two interview formats in Table 6 and Table 7 and evaluate the goodness-of-fit for the Poisson model in Table 8.

Table 6 and Table 7 show two key findings. First, in the descriptive interviews, we found that both the pre-test scores and the total interview assessment scores significantly influenced the prediction of the achievement test scores. As these two assessment metrics were originally designed to forecast future academic performance, we concluded that the results that were obtained in the descriptive interviews are highly valid.

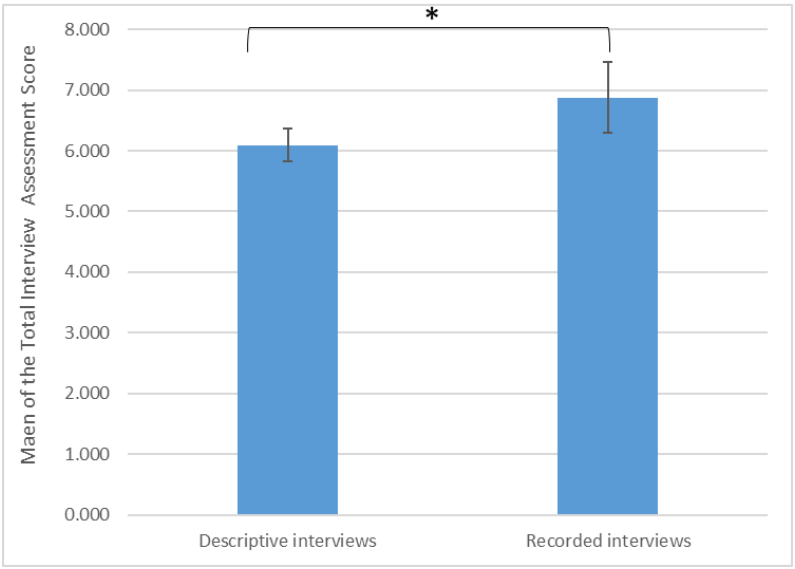

Figure 7: Difference in the sample mean of total interview assessment score between Descriptive and Recorded Interviews
*(Note) In Figure 7, * indicates significance at the 5% level.*

We were unable to replicate the same relationships found in the descriptive interviews in the recorded interviews. The discrepancy in these results may stem from the fact that, as illustrated in Figure 7, the total interview assessment score itself differs between the two cases, which suggests that different interview formats may measure different subjects. Therefore, in the following section, we focus on recorded interviews and analyze the factors that influenced the total interview assessment score in that case.

Table 6: Analysis of Impact of Pre-test Scores and Total Interview Assessment Scores on Final Test Scores Using Poisson Regression Analysis (Descriptive Interviews)

	Estimated Coefficient (beta)	Std. Error	p-value	
(Intercept)	3.880	0.064	<0.001	***
Pre-test score	0.028	0.004	<0.001	***
Total interview assessment score	0.024	0.008	0.002	**

*(Note) In Table 5, ** indicates significance at the 1% level, and *** indicates significance at the 0.1% level.*

Table 7: Analysis of the Impact of Pre-test Scores and Total Interview Assessment Scores on Final Test Scores Using Poisson Regression Analysis (Recorded Interviews)

	Estimated Coefficient (beta)	Std. Error	p-value	
(Intercept)	4.715	0.209	<0.001	***
Pre-test score	-0.004	0.010	0.674	
Total interview assessment score	-0.047	0.027	0.075	

Table 8: Evaluation of Goodness-of-Fit for Poisson Regression Analysis Estimates for Descriptive and Recorded Interviews

	Descriptive interview		Recorded interview	
	Value	Df	Value	Df
Null deviance	321.28	88	87.873	15
Residual deviance	262.66	86	84.532	13
AIC	813.35		188.95	

Note: In Table 7, Null deviance represents the Residual deviance of the model with only the intercept, and AIC indicates the Akaike Information Criterion.

3.2.3 Analysis of Factors Influencing Assessment Results in Recorded Interviews

Building upon the results shown in the previous section, we examined here the factors that influenced the total interview assessment score. Given that a key difference between the descriptive and recorded interviews was the ability to observe facial expressions during the interview, we analyzed the Pearson correlation between facial expressions and total interview assessment scores. The results are presented in Table 9. In this analysis, we found that several facial expressions exhibited a moderate correlation with the total interview assessment scores. We analyzed the impact of facial expressions with such moderate correlations on total interview assessment scores that employ regression analysis. The results are shown in Table 10 and Table 11. The results in Table 9 show that the facial expression of disgust significantly influences total interview assessment scores. Thus, in the scope of this study, we concluded that the total assessment in recorded interviews was influenced by facial expressions rather than measuring future academic performance (achievement test scores).

Table 9: Pearson Correlation between Facial Expressions and the Total Interview Assessment Scores in the Recorded Interviews

	Anger	Contempt	Disgust	Fear	Joy	Sadness	Surprise
Total interview assessment score	-0.067	0.058	0.555	0.095	-0.364	0.224	-0.187

	Sentimentality	Confusion	Neutral	Engagement	Valence	Attention
Total interview assessment score	-0.190	-0.147	0.327	0.037	-0.033	0.061

Table 10: Analysis of the Impact of Facial Expressions on Total Interview Assessment Score Using Regression Analysis (Recorded Interviews)

	Estimate	Std. Error	p-value	
(Intercept)	-0.308	2.519	0.905	
Disgust	0.326	0.123	0.023	*
Joy	0.033	0.029	0.277	
Neutral	0.036	0.025	0.181	
Sadness	0.478	0.293	0.132	

Table 11: Evaluation of Goodness-of-Fit for Regression Analysis Estimates for Recorded Interviews

	Value	Df	p-value
Residual standard error	0.464	11	
Multiple R-squared	0.496		
Adjusted R-squared	0.313		
F-statistic	2.705	(4,11)	0.086

4 Conclusion and Discussion

In this study, we examined the validity of both descriptive interviews and recorded interviews for Japanese university students in a basic statistics course and investigated factors influencing interview assessments.

Our findings led us to the following three main conclusions. First, we determined that, in addition to the pre-tests, descriptive interviews were valid for predicting future academic performance. This suggests that experienced university faculty will be able to accurately gauge candidates' future academic potential by evaluating factors their motivation and other factors within their responses. In recent years, statistical courses have been adopted in most university departments. Our results provide a more general validity assessment that goes beyond previous research in medical education (e.g., [8]). In addition, descriptive interviews are frequently employed in Japan for university admissions and corporate recruitment purposes, and our results affirm the suitability of this format.

However, we were unable to draw a valid correlation between interview assessments in recorded interviews and future academic performance, as we were able to do with descriptive interviews. Two factors may explain this. First, the duration of speech in the recorded interviews was typically around one minute, or a significantly shorter time than the customary length of face-to-face interviews in university admissions, which typically last around 20 minutes. In addition, the faculty members who were involved in the assessments were unaccustomed to evaluating such brief speeches. We posit that this brevity in speech time, coupled with a lack of experience on the evaluators' part, may have contributed to the diminished validity of the results. Second, there were few participants in the recorded interviews, with only 16 individuals involved. This discrepancy can be attributed to the heavier burden associated with conducting the recorded interviews relative to the descriptive interviews, resulting in fewer participants. Future enhancements may be necessary to address this.

Third, we suggest that the assessment scores for the recorded interviews might not be able to provide a prediction of future academic performance but is rather influenced by facial expressions in the interview, particularly negative ones, such as disgust. Expressions of disgust are non-selfish moral signals [20]. This expression may lead interviewers to perceive the interviewees to be good and moral. While this conclusion is limited, as factors such as the short duration of recorded interviews mentioned above, we point out that in general, evaluators have a tendency where negative facial expressions are highly rated. Regarding this trend, [21] investigated the relationship between smiling and hiring decisions in job interviews. Their findings indicated that participants who smiled excessively received lower interview evaluations and had a decreased chances of being hired. They also noted that this relationship between smiling and hiring evaluations is particularly prominent in jobs that are associated with a serious demeanor. Furthermore, considering the foundational finding by [22] that negative facial expressions are perceived to be indicative of maturity, we concluded that negative facial expressions would be perceived by evaluators as mature. In other words, as the interviews were conducted in university courses with reference to university admissions exams, which we targeted in this study, they corresponded to situations where a serious demeanor is required, and a mechanism that similarly values negative facial expressions likely operated.

However, alternative explanations for our results are also plausible. The recognition and quan-

tification of facial expressions used in our study are based on the Facial Action Coding System in [18] and [19]. Nevertheless, recent research [23] demonstrated in experiments that Japanese facial expressions do not necessarily conform to this basic model. Taking the results of this prior research into account, we reanalyzed our results using a facial expression model that was better suited to Japanese individuals. In particular, among the negative facial expressions, only disgust was correlated with the interview assessment scores, not anger, which may relate to the findings of [23]. Even so, joyful and disgusted facial expressions are representative facial expressions that are positioned oppositely on the pleasant–unpleasant dimension in affective psychology research ([24], [25]), and the results of this study are consistent with those of previous studies.

Finally, we outline three future challenges regarding recorded interviews. The first challenge lies in conducting additional research on the recorded interview. As discussed in section 2, significant differences in participants were observed between the recorded interview and the descriptive interview due to issues related to the data collection method and timing. Moving forward, it is necessary to conduct additional research on the recorded interview to match the sample size of the descriptive interview. This will allow for a more discovery of the differences between the two interview methods. The second challenge is the implementation of large-scale and long-duration recorded interviews. As mentioned in the above conclusion, the findings of the recorded interviews regarding facial expressions conducted in this study were intriguing yet limited. To generalize these findings, it will be necessary to increase the number of participants and conduct interviews with longer speech durations. The third challenge is examining the relationship between negative facial expressions and interview assessments in more detail. For example, considering the special factors related to Japanese facial expressions highlighted by [17] or conducting interview assessments in experimental settings using more controlled facial stimuli would provide valuable insights for future research in assessment studies.

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