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A Rasch Analysis of Achievement Goal Orientation Scale in Language Education Context

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Abstract

Motivation plays a crucial role in determining students' academic achievement. An important aspect of motivation is student achievement goals or Achievement Goal Orientation. The trichotomous model of Achievement Goal Orientation has been widely used: Mastery Goal Orientation, performance approach Goal Orientation, and Performance-Avoidance Goal Orientation. Educators must be familiar with the orientation students adopt, as it shapes their approach during teaching and learning. This paper examines the validity and reliability of Achievement Goal Orientation in a language education context. One hundred twenty-three secondary school students attended the survey, involving 55 (44.7%) males and 68 (55.3%) females. The instrument was adopted from Elliot and Church's Achievement Goal Orientation Questionnaire (1997) and was modified into the language domain. The initial version of the instrument consisted of 20 items, while the final version, after modification, consisted of 13 items. The Rasch Measurement Model was used to validate the instrument. All the psychometric properties confirmed the validity and reliability of the instrument. Rasch analysis revealed that the scale showed strong evidence of validity and reliability in the language education setting. It is suggested that language teachers and experts use the scale to improve language learners' performance. The findings of this study may be tested in other fields of study to get more robust validation results for further validation of the scale.

Keywords: Achievement Goal Orientation, Scale Validation, Rasch Model Analysis, Language Education Context

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1. INTRODUCTION

Achievement Goal Orientation is one of the most significant aspects of students' development in the learning process (Alhadabi and Karpinski, 2020; Mascret,2015). Student Achievement Goal Orientation is based on how students perceive their competencies during teaching and learning (Tapola and

Niemivirta, 2008; Guo and Leung, 2021). In this regard, it has already been found that the most widely accepted Achievement Goal Orientation is the Trichotomous Model. This model comprises three types of orientation, namely Mastery Orientation (to enhance competency), Performance-Approach Orientation (to demonstrate competency), and Performance-Avoidance Orientation (to avoid demonstrating incompetency) (Elliot and Harackiewicz, 1996). Each orientation has a different influence on students' development in the learning process and determines their performance. Generally, Mastery Orientation has an adaptive value (Anderman and Wolters, 2006; Kaplan and Maehr, 2007), while Performance-Avoidance Orientation has a maladaptive value. Meanwhile, Performance-Approach Orientation has adaptive (Harackiewickz *et al.,* 2002) and maladaptive values on the student's learning process and performance (Voon and Voon, 2020). Hence, teachers and parents need to know students' orientations, especially in the language learning process.

In the process of learning, motivation occupies a unique position (Darvin and Norton, 2021). As a construct, it is rooted in many theories, such as self-efficacy theory (Bandura, 1997), self-determination theory (Ryan and Deci, 2000), and psycho-dynamic theory (Westen, 1998). In English language education, teaching and learning are essential elements of school curricula worldwide (Sudarmo, 2021; Richards, 2015; Hall, 2017). It is included in the curriculum as an important and compulsory subject in many countries. Considering its essential role in developing human capital, language, especially English, occupies an enviable position as one of the critical subjects in the education curriculum worldwide (Pennycook, 2017; Halimovna, 2020). Its contributions to human capital development have been observed and become prominent, which can be seen in the form of its integration with other subjects, including Geography, Physics, Chemistry, Biology, and Science in the school curriculum of many countries (Jaborrov, 2020; Hedgcock, and Ferris, 2018).

Many studies have used the item response theory (IRT) method for validating educational instruments in social science fields. Researchers have called IRT analysis a valuable addition to the testing theory approaches (Fadli *et al.,* 2019). It focuses on items' quality in measuring underlying constructs (Chan *et al.,* 2021). In this regard, the Rasch model analysis may give the researchers more confidence to apply the scale in English language education. The arithmetic properties of the interval scale provide comprehensive information on the interactions between persons and items. The Rasch model's application within goal orientation measurements has expanded in recent years. It has been used to analyze the possible psychometric cause of earlier

inconsistencies between models of achievement goal theory and other constructs (Nur *et al.,* 2020).

Hence, the current study aims at validating the goal orientation scale in language teaching and learning context, especially to bridge this gap in the current psychometric research by analyzing the model data fit of items using a multidimensional Rasch model analysis in this study. This study will further contribute towards using the Achievement Goal Orientation Scale in language studies teaching and learning in school, which has yet to be focused appropriately. Applying the validated scale using the Rasch analysis approach may provide easy access to teachers to explore language-related problems, motivate students to language learning, and overcome the barriers to language learning in a language class (Hall *et al.,* 2015; Miller *et al.,* 2021).

2. GOAL ORIENTATION ACHEIVMENT

The Trichotomous Model of achievement goal orientation is based on the Hierarchical Model of Achievement Motivation, initially developed by Elliot and Church in 1997 (Chang and Song, 2020; Reeve, 2005). Achievement Goal Orientation is related to achieving the needs and avoiding failures. A person who concentrates on achievement will engage in behavior related to a task or accomplishment. On the other hand, avoiding failure is the opposite of the need to achieve, which inhibits one's effort to achieve a task or behavior (Chen, 2015). The hierarchical model of achievement motivation revolves around the motive to achieve and avoid failure. The motive to achieve is related to Mastery Goal Orientation and Performance-Approach Orientation. The motive to avoid failure is associated with the performance approach and Performance-Avoidance Orientation (Elliot and Church, 1997), as illustrated in Figure 1.

Based on the model, Elliot, and Church (1997) have developed an 18-item questionnaire to measure the strength of each goal. Several other studies on Achievement Goal Orientation report a good reliability value of the construct (Table 1). However, the studies have their purposes and various target groups. Hence, this paper attempts to ensure the validity and reliability of the instrument modified into the language domain by targeting the students in Pakistani language classrooms.

Figure 1. Hierarchical Model of Achievement Motivation

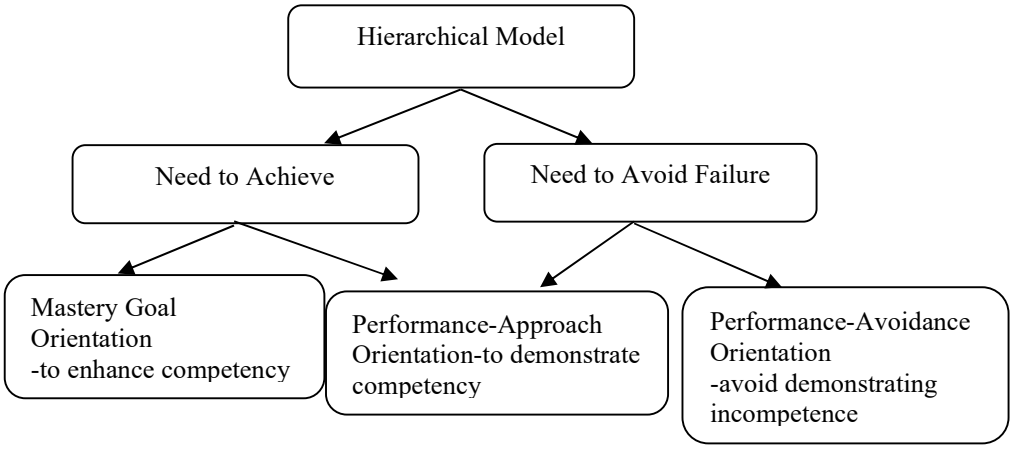

Table 1. Reliability Value for Construct Measuring Achievement Goal Orientation

Researcher(s)	Reliability			Focus
	Mastery Orientation	Performance-Approach Orientation	Performance-Avoidance Orientation	
Lavasani et al. (2011)	0.79	0.85	0.81	Domain: Educational Science and Psychology. Target Group: Tehran undergraduate students
Malmberg (2008)	0.77	0.81	0.67	Domain: Secondary school grade Target Group: U.K. student teachers
Luo et al. (2011)	0.84	0.88	0.80	Domain: Mathematics Target Group: Singapore secondary school students
Dupeyrat et al. (2011)	0.86	0.89	0.73	Domain: Mathematics Target Group: French secondary school students
Luo et al. (2011)	0.81	0.86	0.78	Domain: English Target Group: Singapore secondary school students
Rostami et al. (2011)	0.77	0.81	0.67	Domain: English Target Group: Tehran secondary school students
Zare et al. (2011)	0.76	0.75	0.79	Target Group: Athletes

3. INSTRUMENT VALIDATION

A questionnaire is a helpful tool for collecting intended information in descriptive survey studies because it helps to collect extensive data that is usually difficult to observe directly (Protogerou and Hagger, 2020). Generally, there are three ways to select a survey instrument: i) use an existing instrument, ii) develop a new instrument, or iii) adapt an existing instrument (Adam, 2020). The rationale for choosing the most appropriate approach is based on the objective(s), purpose(s), types of analysis used, and the most important aspects to be considered. This is an instrument with good reliability and validity. For this study, the instrument used was an adaption from an existing questionnaire, the Achievement Goal Questionnaire, developed by Elliot and Church (1997). This questionnaire was deliberately chosen as it had the same intention and addressed the same outcomes from the survey. Besides, many studies have proved its reliability and validity. Hence, only some items were added, deleted, or modified to contextualize and focus the Students' Achievement Goal Orientation on language teaching and learning in the Pakistani context.

Validity and reliability are the most essential elements to be tested before a questionnaire is used (Findley *et al.,*2021). Validation of an instrument is mandatory in collecting data since it is the tool to infer specific issues or problems (Gagné *et al.,* 2015). Hence, a high-quality instrument interprets the collected data in meaningful ways that may be applied in general, not only to the tested sample (Binti Dawood, 2021). Since a questionnaire usually measures subjective variables such as intelligence, future goal orientation, and others, validating it is somewhat challenging and needs to be carried out carefully. High care must be demonstrated, mainly when the tested variable is influenced by a range of factors that are hard to control (Baldus *et al.,* 2015). Validating a questionnaire provides several advantages, especially in interpreting the collected data. One stage in the validating process is checking the word selection, terms used, and grammatical aspects. Detection of ambiguities and misinterpretations can reduce bias. Hence, ambiguities must be minimized in an instrument to ensure its objectivity. Besides that, in piloting the questionnaire, the elements of feasibility, acceptability, consumption of time, and energy can be pre-examined (Sushil and Verma, 2010). On top of that, the focus in validating a questionnaire is to confirm that the construct and items involved are measuring what they are supposed to.

4. RASCH MODEL IN THE CONTEXT OF GOAL ORIENTATION MEASURMENT

Validation aims to establish the reliability of a measuring instrument (Chan *et al.,* 2021). The mechanism is confirmed as a tool to measure the intended concept and be a reflector of reality (Nur *et al.,* 2020). In contrast, reliability is the concept of testing an instrument to ensure its stability and consistency in producing similar results when administrated repeatedly in different conditions (Fadli *et al.,* 2019). Generally, validation of an instrument involves the process of face, content, discriminant, and construct validity, while the reliability test involves internal consistency and split-half or test-retest reliability (Chua, 2006). Face validity is the most straightforward validation process, but it is not a potent form of validation. It usually occurs at the initial phase of validation. The purpose of conducting face validity is to examine the appropriateness of items and ensure that the questionnaire includes relevant constructs and items for measuring the variables (Su *et al.,* 2020). Appearances of the instrument regarding style, formatting, language clarity, readability, and feasibility are also checked thoroughly. In addition to face validity, content validity refers to representing items to cover all aspects of a given social concept (Gall *et al.,* 2003). In other words, it concerns the extent of the instrument that reflects the concept measured (Institute for Health and Care Research, 2010). This kind of validity is also established by having a review from experts in the subject matter (Jansen, 2007). For this study, expert reviews were taken to ensure the construct and suggested items measured and covered the concept of Student Achievement Goal Orientation in Language. After getting the face and content validity, construct and discriminant validity are then assessed. Both are complex to be measured. Construct validity intends to measure the consistency of the test measure to the relevant theoretical abstract, concept, or construct (Kane, 2001).

Simply put, it determines the goodness of fit of model components. On the other hand, discriminant validity is used to determine the degree of actual differences between groups and detect no difference when there is none. This study used the Rasch Measurement Model to confirm the construct and discriminant validity. Besides the validity, a good questionnaire must be reliable, indicating how well the items fit together conceptually (Dedeoğlu *et al.,* 2020). One of the ways to measure it is Cronbach's Alpha Correlation Coefficient. The suggested acceptable internal consistency, which many measurement experts agree upon, is that it should show only a moderate correlation among items (0.70 to 0.90). Rasch Measurement Model is a

powerful statistical tool. It is a more reliable and valid assessment (Saidfudin, 2011). The underlying basis of the Rasch Measurement Model is the Item Response Theory, which strongly emphasizes the items and the persons involved in the study. The model gives users a clear picture of the interrelationship between the persons and the variables being assessed. To confirm the item validity in an instrument, the items must differentiate between persons' high and low ability. Otherwise, the things need to be modified or eliminated. This matter can be reflected in the Rasch Model's item reliability analysis, confirming the instrument's construct validity. Furthermore, the utmost advantages of using Rasch Analysis are that it is the only model that can fulfill the requirement of a good measurement model that can produce linear measurements, overcome missing data, detect outliers, give estimates precision, and provide independent measurement instruments (Nur *et al.,* 2020).

5. PROBLEM STATEMENT

Many studies have examined the validity of the Achievement Goal Orientation Scale in numerous fields of study. However, little evidence exists from the Pakistani secondary education context about its application, and it has not been seriously used in the language teaching and learning domain. This study was purposefully designed to evaluate the validation features of the Achievement Goal Orientation Scale in the language education domain in the Pakistani secondary school education system to provide more evidence for its usefulness and application in a different cultural context.

This study aims to validate achievement goal orientation in Pakistan's language education context.

6. METHODS AND MATERIALS

6.1. Sample

A total of 123 private secondary school students in district Chitral Pakistan were chosen as a convenient sample in this study, in which 55 of them (44.7%) were males, while the rest (n=68, 55.3%) were females as presented in Table1. The study was conducted as a pilot study in one English medium secondary school (Shaheen Public School Chitral) pseudonym, considered one of the best schools among the renowned private secondary schools in the area in terms of its academic results. The students cooperated by showing willingness to participate in the study. Other schools did not cooperate fully to

allow the students to be part of the research due to personal reasons. The researchers received verbal consent from the students during the distribution of the instrument. No written consent forms were given to the sample to get their formal support to participate in the study. The school administration also showed full cooperation during the data collection process. To ensure the suitability of the instrument to a wider range of students, the samples were selected from the Science Stream and Arts Stream who had taken English as their compulsory subject. The students were given a set of questionnaires, which took about 20 minutes to complete.

Table 1. Sample of Study

School	District	Selected Sample	Percentage %
Shaheen Public School	Male	55	44.7
	Female	68	55.3
	Total	123	100

6.2. Instrumentation

Instrument validation is a complicated process. Many steps must be followed in validation, such as scale development, item generation, pilot testing, data collection, and analysis (Hinkin, 1995). The instrument used in this study was adapted from Elliot's Achievement Goal Orientation Questionnaire, which was modified into the language domain. The underlying theory behind this instrument is the Achievement Motivation Theory. Three primary constructs in this questionnaire measure the Student Achievement Goal Orientation in learning language subjects.

6.3. Procedure of Study

Firstly, the original item of Elliot's Achievement Goal Orientation Questionnaire was modified into the language domain. Then, it was given to experts and students for review. After taking their feedback and comments, the interim version of the questionnaire was distributed to 123 samples to collect their responses (Olson, 2010). The collected data were analyzed using the Rasch Measurement Model to confirm the reliability and validity.

7. FINDINGS OF STUDY

The study's findings, including the results of testing the initial and interim versions of the instrument, are discussed below.

7.1. Testing the Initial Version of Items

Initially, there were 18 items, of which six measured each of the Achievement Goal Orientation, as shown in Table 1 (Mastery, Performance-Approach, Performance Avoidance). Each item uses a 4-point Likert scale running from strongly agree to disagree strongly. The highest mean value determines which orientation the students adopt more.

7.2. Expert Review

After completing the item development process, the initial version of the questionnaire was given to experts to evaluate face and content validity. The experts were asked to determine whether all the items qualified to be included in the questionnaire. For this purpose, the expert views of two lectures from a local private college were elicited. Both experts had 15 years of teaching experience in English teaching courses. The two main aspects that were discussed with them were face validity and content validity. Both experts agreed on the qualification of the instrument to measure Student Achievement Goal Orientation, which confirmed the face validity. The suitability of the items for each construct (content validity) was also observed regarding the adequacy of items, words, and terms selection and the language used. The review process confirmed face and content validity, with only minor recommendations given for refinement. Based on the discussion and review results, one of the main refinements was to separate sentences that used the sequence connector "or" into three different items, as shown in Table 3. This was done because one of the characteristics of a good item is to avoid using connectors “or” because it causes confusion for the respondent to respond to the item (Chua, 2006). Furthermore, when students were asked about their views on a particular item, some of them were confused and thus gave their responses without considering the last two parties (friends or teacher), the first two parties (family or friends), or just thinking of their friends as persons who surround them in the English class. This was supported when running the Rasch analysis; the item *“I want to do my best in Mathematics class to show my ability to my friends.”* satisfied all the psychometric properties, while the other two were eliminated.

Table 2. Refinement of Item

Original Version of Item	Refinement of Item
I want to do well in English class to show my ability to my family, friends, or teacher.	- I want to do well in English class to show my ability to my family. - I want to do well in English class to show my ability to my friends. - I want to do well in English class to show my ability to my teacher.

7.3. Testing of the Interim Version of the Item

After getting the student responses and expert review, the interim version of the questionnaire consists of 20 items: six items for Mastery Orientation, eight for Performance-Approach Orientation, and six for Performance-Avoidance Orientation. This set of the interim version of the item was then analyzed by applying the Rasch Measurement Model.

7.4. Summary Statistics

The results showed that Cronbach's Alpha Coefficient was 0.86, indicating the instrument's high reliability (Gay *et al.,* 2009). It is an accepted value that allows the use of the instrument for further analysis (Chua, 2006). Besides that, the reliability coefficient for a person was 0.83, while the reliability coefficient for the items was excellent, which was 0.95 (Azrilah, 2011). The exemplary reliability indicates the sufficiency of items in the instrument and person range who were involved in the study.

Table 3. Summary Statistic for Person

	Raw score	Count	Measure	Model error	Outfit			
					MNSQ	ZSTD	MNSQ	ZSTD
Mean	40.1	13.0	1.50	.50	1.00	.0	1.00	.0
SD	5.5	.0	1.33	.10	.47	1.2	.48	1.2
MAX	51.0	51.0	5.25	1.05	2.82	3.2	2.70	3.1
MIN	24.0	13.0	-1.64	.41	.23	-2.8	.22	-2.8
Real RMSE	.55 ADJ.SD 1.21 .83		Separation 2.18			Person Relaibility		
Model RMSE	.51 ADJ.SD 1.23 .85		Separation 2.40			Person Relaibility		
Crobach's Alpha	Cronbach's Alpha (KR-20) Person Raw Score Realibility =.86							

The instrument has a low measurement model error (+/- 0.50), moderate person separation (2.18), and excellent item separation (4.60). Lastly, the value of infitMNSQ and Z-Standard for the item (1.00, 0.00) and person

(1.00, 0.00) were both ideal (1, 0), indicating the instrument measures what it is supposed to measure (goodness-of-fit) (Saidfudin, 2011). Tables 3,4 and 5 below show the summary statistics of the results.

Table 4. Summary Statistic for Item

	Raw score	Count	Measure	Model error	Outfit			
					MNSQ	ZSTD	MNSQ	ZSTD
Mean	339.2	110.0	.00	.17	1.00	.0	1.00	.0
SD	29.6	.0	.81	.01	.13	1.0	.15	1.0
MAX	384.0	110.0	1.20	.19	1.18	1.2	1.38	2.2
MIN	293.0	110.0	-1.32	.15	.72	-2.3	.74	-2.1
Real RMSE	.17 ADJ.SD .79		Separation 4.60		Person Relaibility .95			
Model RMSE	.17 ADJ.SD .79		Separation 4.74		Person Relaibility .96			

Table 5. Reliability of Constructs

Construct	Cronbach Alpha Coefficient	Level
Mastery Goal Orientation	0.83	Good
Performance-Approach Orientation	0.78	Moderate
Performance-Avoidance Orientation	0.95	Excellent
All Item	0.95	Excellent

7.5. Item Fitting

The purpose of item fitting analysis is to identify misfit items (outliers). In Rasch's analysis, the first four criteria, as shown in Table 6, may be fulfilled to clarify a particular item as an outlier and can be eliminated.

Table 6. Criteria for Item Fitting Test

No.	Criteria	Value/Range
1	Pt-Measurement Correlation	Positive (0.32 to 0.85)
2	Outfit Mean Square (MNSQ)	0.5 < MNSQ < 1.5
3	Oufit Z-Standard (Z-STD)	-2 < Z-STD < +2
4	Infit Mean Square	Must be less than the sum of the Mean and Standard Deviation
5	Item Measurement Value for Same Construct	Must be a Different Value

The result for the last iteration shows that all the items have a positive point-measure correlation range from 0.48 to 0.66, which satisfied the first criteria, and thus, all the items were considered fit items. Besides the first four criteria, the value of item measurement for the same construct must also be observed. If the value is the same, it indicates that the respondent views both

items as measuring the same thing (Saidfudin, 2011); hence, one of the items should be deleted. In considering which item should be kept and to maintain construct validity, the item with an MNSQ value near one and Z-Std near zero is said to have better fitting (Saidfudin, 2011). As shown in Table 7 (Item 5 and Item 20) and Table 8 (Item 6 and Item 9), the items have the same logit values, which were -0.23 and -0.30 respectively. However, since both items were not located in the same construct, no elimination of items was needed.

Table 7. Analysis of Item Fitting (1st Iteration)

Entery Num.	Raw score	Count	Measure	Model SE	INFIT		OUTFIT		PIME A CORR.	EXACT OBS	Item
					MN SQ	ZS TD	MN SQ	ZS TD			
5	386	121	-.23	-15	.78	-1.8	.83	-1.3	.56	67.8	PE2
20	386	121	-.23	-15	1.19	1.4	1.12	.9	.53	58.7	M6
10	437	121	-1.60	-18	1.28	1.9	1.57	2.5	.26	62.8	M3
Mean	372.9	121.0	.00	.15	1.01	.0	1.02	.0		60.0	
SD	32.8	.0	.73	.01	.16	1.2	.19	1.2		4.5	

Table 8. Analysis of Item Fitting (Last Iteration)

Entery Num.	Raw score	Count	Measure	Model SE	INFIT		OUTFIT		PIME A CORR.	EXACT OBS%	Item
					MN SQ	ZS TD	MN SQ	ZS TD			
7	293	110	1.20	-15	.78	2.3	.74	-2.1	.65	57.4	PE5
10	298	110	1.8	-15	.72	.2	1.03	.21	.63	58.5	M5
12	303	110	.97	-15	1.03	1.9	1.11	.91	.58	58.8	PE6
11	312	110	.75	-16	1.14	1.1	1.14	1.1	.63	59.2	PD8
6	330	110	.30	-16	1.08	.6	1.02	.21	.57	61.0	PE4
9	345	110	-.10	-16	1.05	.4	.92	1.5	.66	61.0	M4
4	345	110	-.30	-17	.94	-.4	.98	.01	.60	62.5	PD4
2	352	110	-.30	-17	.99	-.1	.87	.08	.61	62.7	PE2
13	357	110	-.45	-17	.83	1.3	1.04	.03	.60	63.8	M6
3	361	110	-.57	-17	1.14	1.0	1.38	2.1	.48	64.2	PD3
5	363	110	-.63	-18	1.18	1.0	.86	.91	.53	64.6	M2
1	381	110	-1.22	-19	.86	1.0	.99	.51	.54	66.9	PD2
8	384	110	-1.32	-19	1.00	.8	90	.01	.52	67.6	PD5
Mean	372.9	121.0	.00	.15	1.01	.0	1.02	.0		60.0	
SD	32.8	.0	.73	.01	.16	1.2	.19	1.2		4.5	

7.6. Person Fitting

The same procedure as item fitting analysis was taken in considering the misfit person. As shown in Table 9, five misfit persons were detected (33, 34, 52, 118 and 122). The correlation value, outfit MNSQ, Outfit Z-Std, and Infit MNSQ, were out of the accepted value and range. Therefore, these five persons were eliminated and excluded in the subsequence iteration.

Table 9. Analysis of Person Fitting

Entery Num.	Raw score	Count	Measure	Model SE	INFIT		OUTFIT		PIMEA CORR.	EXACT OBS%	Match EXP%
					MN SQ	ZS TD	MN SQ	ZS TD			
34	70	20	2.36	1.73	1.73	2.1	1.75	2.1	.26	55.0	4244434 4443344 344224
53	69	20	2.19	3.91	3.91	5.7	5.44	5.7	-.11	45.0	4444444 1413144 434444
122	60	20	.96	2.01	2.1	2.6	1.94	2.6	1.09	40.0	3243333 3234341 442432
118	59	20	.84	1.72	1.72	2.0	1.70	2.0	.20	25.0	2334433 2234242 442422
33	51	20	.02	1.63	1.63	1.9	1.69	1.9	.25	40.0	4123322 1332244 323313
MEAN	61.0	20.0	1.38	.40	1.00	-.1	1.2	-.1	60.0	58.5	
	8.02	.0	1.28	.20	.49	1.5	.58	1.5	14.9	7.4	

7.7. Unidimensionality

The unidimensionality test was conducted in this study to ensure that the instrument measures specific objectives (Saidfudin, 2011), in this case, students' achievement goal orientation in mathematics. The analysis involved Principal Component Analysis (PCA), which looked at how much the instrument's variance was for measuring and what was supposed to be measured. In PCA, the two main aspects to be highlighted were the value of variance explained by measure and unexplained variance first contrast. The value for the variance explained by measures shown in Table 10 was 56.8%, which is very close to the expected model value (56.6%). This value satisfied the minimum requirement for unidimensional and passed the cut low point of Rasch, which is 40% (Saidfudin, 2011). Furthermore, the value for unexplained variance in the first contrast was 5.9%, which is good (Fisher, 2007).

Table 10. Principal Component Analysis

		Empirical		Modeled
Total variance in observations	30.1	100.0%		100.0%
Variance explained by measures	17.1	56.8%		56.6%
Unexplained variance (total)	13.0	43.2%	100.0%	43.4%
Unexplained variance in first contrast	1.8	5.9%	13.7%	

The local dependence test for the most considerable Standardised Residual Correlation was then conducted to see the instrument's inter-

correlation. The requirement to be satisfied was that the correlation coefficient must not exceed 0.7, meaning that the item should have a moderate correlation coefficient with other things. As shown in Table 11, the correlation coefficient was 0.21 to 0.37, which satisfied the condition and indicated the independence of the items (Saidfudin, 2011).

Table 11. Local Dependent Test

Largest	Standardised Residual Correln	Residual Entry Number ITe	Correlations Entry Number ITe
	-.37	6PE4	11PD8
	-.29	-4PD4	10M5
	-.28	5M2	10M5
	-.27	1PD2	7PE5
	-.27	7PE5	9M4
	-.23	5M2	11PD8
	-.22	7PE5	13M6
	-.22	8PD2	12PE6
	-.21	3PD3	13M6
	-.21	1PD2	12PE6

7.8. Differential Item Functioning

The purpose of running the Differential Item Functioning Test is to ensure that no biased item exists. Criteria that should be satisfied are i) the value for the difference measure must be less than 0.5 and ii) the value for difference-t must be in the range of -2 < difference-t < 2. Items will be deleted if both conditions are not satisfied. As shown in Table 12, Item 1 was eliminated since it violated the condition.

Table 12. Differential Item Functioning Analysis

Person	Observations		Baseline		DIF		DIFDIFDIFDIF			Item
Class	Count	Avr.	Expect number	Measur name	Score	Measure	Size	S.E	t	Name
2	17	1.00	1.98	-.48	-.98	-1.54	2.02	.34	5.92	10001
3	53	2.00	2.15	-.48	-.15	.10	.38	.21	1.77	10001
4	53	3.00	2.53	-.48	.47	-5.62	-5.14>	1.81	2.85	10001
2	17	2.24	2.07	-.70	.16	-1.12	-.42	.40	1.06	10002
3	53	2.25	2.23	-.70	.01	-.73	-.03	.23	.14	10002
4	17	2.53	2.59	-.70	-.06	-.06	.24	.26	.90	10002
2	53	1.59	1.34	.87	.24	24	-.49	.35	1.40	10003
3	53	1.57	1.56	.87	.01	.01	-.02	.20	.10	10003
4	17	2.00	2.09	.87	-.09	-.09	-.22	.22	-1.2	10003

7.9. Rating Scale Validation

The research instrument used the 4-Point Likert Scale as the rating scale. Rating scale validation was run to determine the appropriateness of the number of response categories. Two aspects were considered in the validation process: value for observed average and structure calibration. Tables 13 and 14 show the rating scale validation analysis for the first and last iteration, respectively, while Figure 2 shows the items' response distribution. Value in the observed average column shows the increment from -0.64 to 2.85. This indicates that the response pattern was consistent, and the values in the structure calibration inform about the transition in choosing one scale to another scale. The value should be greater than 1.4 and not more than five (Saidfudin, 2011). According to Azrilah (2011), if the value is less than the minimum logit, then the scale should be combined (*collapse*), but if the value is more significant than the maximum logit, then the scale should be separated (*split*).

Table 13. Rating Scale Analysis (1st Iteration)

Category Label	Category Score	Observed Count %	Obsvd Average	Sample Expect	Infit MNSQ	Outfit MNSQ	Struct. Calib.	Diff. CLB
1	1	83	-.28	-.40	1.08	1.23	Non	0.00
2	2	409	.24	.24	1.02	1.02	-.59	1.59
3	3	1155	1.08	1.10	.96	.96	-.39	1.30
4	4	773	2.35	2.32	.96	.97	2.07	2.46

As shown in Table 14, only some of the different values for structure calibration satisfied the requirement, but it was met at the last iteration. Hence, the rating scale need not be collapsed or split and remain intact.

Table 14. Rating Scale Analysis (Last 4th Iteration)

Category Label	Category Score	Observed Count %	Obsvd Average	Sample Expect	InFit MNSQ	OutFit MNSQ	Struct. Calib.	Diff. CLB
1	1	43	-.28	-.40	1.11	1.12	Non	0.00
2	2	234	.24	.24	1.04	1.05	-2.06	2.06
3	3	714	1.08	1.10	.98	.95	-.44	1.62
4	4	439	2.35	2.32	.94	.96	2.49	2.93

7.10. Item-Person Mapping

To confirm the construct validity of the items, we looked at the Item-Person Mapping. It shows the difficulty order of the items and the ability order of the person. The item difficulty order must be in place to ensure that the instrument construct is in order. Since there is no item in the same construct in all iterations with the same measurement value, the order of all items was in place. The summary of the psychometric analysis of the Rasch Measurement Model of the instrument is as follows.

Table 15. Summary of Analysis

No.	Aspects	Value	Description
1	Cronbach Alpha Coefficient	0.86	Accepted
2	Item ReliabilityCoefficient for the Construct of Mastery Goal Orientation.	0.83	Good
3	Item ReliabilityCoefficient for the construction of Performance-Approach Goal Orientation	0.78	Moderate
4	Item ReliabilityCoefficient for the Construct of Performance-Avoidance Orientation	0.95	Excellent
5	Item ReliabilityCoefficient for All Items	0.95	Excellent
6	Person Reliability Coefficient	0.83	Good
7	Item Separation Value	4.60	Very Good
8	Infit MNSQ value for item (ideal=1)	1	Ideal
9	Infit MNSQ value for person (ideal = 1)	1	Ideal
10	Z-STD value for item (ideal = 0)	0	Ideal
11	Z-STD value for person (ideal = 0)	0	Ideal
12	Variance Explained by Measures	56.8	-satisfied the minimum requirement of unidimensional -satisfied cut-low point of Rasch (405)
13	Local Dependence Test	< 0.7	All items are independent
14	Observed Average	Increase in Sequence	Consistency response
15	Structure Calibration	1.4<Structure Calibration <5	Rating scale maintained

8. DISCUSSION

The main aim of this paper was to test the dimensions of achievement goal orientation in the context of language education in Pakistan. Several iterations were conducted until there were no misfit items and misfit persons in producing a set of stable and valid instruments with a total of 13 items, as all the psychometric properties were satisfactory. The Rasch Measurement Model was applied to determine the reliability and validity of the instrument. The result confirmed the instrument's usability for measuring Student Achievement Goal Orientation in the Pakistani context, specifically for secondary school students. The aspects investigated were face validity, content validity, item reliability, person reliability, item fitting, person fitting, unidimensionality test, rating scale validation, and construct validity. The results of this study further verify the results of previous studies (Hoi and Mu, 2021) on the validation of achievement goal orientation in other cultural contexts. For example, Barkur, Govindan, and Kamath (2013) examined the relationship between academic achievement goal orientation and the performance of Malaysian students in

Indian medical schools. They used the confirmatory factor analysis technique to assess and validate the scale and found encouraging improvement in students' performance concerning the mastery goal approach.

Similarly, Hall, Hanna, and Hall (2015) studied the association between achievement goal orientation and academic performance among U.K. pharmacy students. They applied exploratory factor analysis and confirmatory factor analysis to validate the scale. Based on their assessment, they found that the mean score was for mastery approach orientation and concluded that goal orientation played a vital role in the academic performance of pharmacy students. Further evidence of construct validation of the instrument is provided in a study conducted by Midgley, Kaplan, Middleton, Maehr, Urdan, Anderman, and Roeser (1998) based on confirmatory factor analysis. They found good model fit and clear distinctions among all the items in the scale.

The present study found that all the items with a positive point-measure correlation ranging from 0.48 to 0.66 satisfied the first criterion. Thus, all the items were considered as fit items. This finding aligns with previous studies' results (Ningsih *et al.,* 2021). as reported from other contexts. For example, a study conducted by (Pastor *et al.,* 2007) provided further evidence for assessing achievement goal orientation among college students using multiple regression and cluster analysis. They found mixed results regarding the achievement-related outcomes of the students and recommended further testing of the scale. Based on these testing results, it is inferred that it is essential for effective learning and performance of language students to be sufficiently motivated. Researchers have already established that motivation is the foundation for developing them into independent learners as future language educators (Leeming and Haris, 2022; Gardner, 2014). Such learning would help the language students achieve high professional growth and development (Hoi, 2020). This study provided evidence that the achievement goal orientation scale can be used for the development of language students in the Pakistani context and for overcoming the problems faced by them in the context of language learning in Pakistan because the scale showed strong evidence of validity and reliability as shown in the analysis section above. Language teachers and experts may use the scale to improve students' performance and motivate them to learn a language.

9. CONCLUSION

The scale testing in this study revealed that the achievement goal orientation is highly reliable and valid in the context of English language

education in Pakistan. The analysis showed that all the scale parameters were within the threshold point. The reliability of the scale was much better than its previous validation evidence. The validation of the scale provides more opportunities for language instructors to improve achievement motivation among students before preparing them for learning. The scale may be used to assemble essential data regarding the issues and challenges of language learning and how to improve students' primary motivation for language learning.

The validation of the scale in the context of language learning plays a vital role in the academic performance improvement of language students in Pakistan. By applying this scale, the students and teachers may get more real chances for language learning motivation. The results of his research are essential because language educators must ensure that students are motivated to learn before designing learning activities in the context of a language classroom. This will enable them to produce the desired language performance among the students as they will feel encouraged and rewarded. This type of assessment may better prepare the students for lifelong learning.

This research suggests that the questionnaire be used to collect information about Achievement Goal Orientation in language subjects in other contexts. The results of this study may be tested in other fields to validate the psychometric features of the scale further. Lastly, as a recommendation, it is suggested that language researchers use the instrument to enhance the language learning abilities of students in schools. The findings of this study may also be tested with convergent validity in the future to investigate the similarities and differences between the instrument and other devices.

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Figure 2. Items Response Distribution

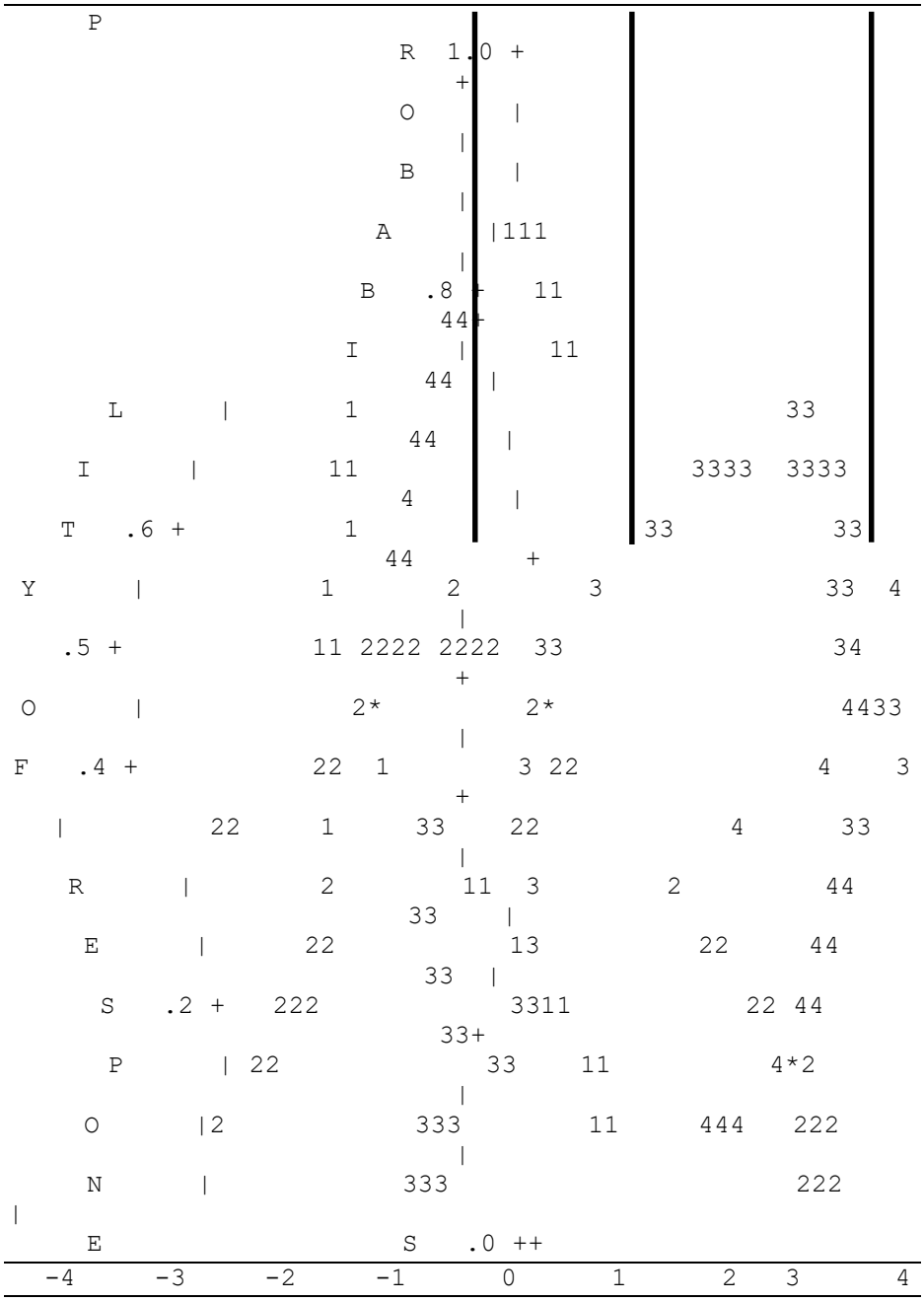

Figure 3. Item-Person Map