Validation of the Academic Motivation Scale for University Students in Pakistan

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Abstract
The objective of the study was two folds, (1) first it aims to validate the psychometric properties of the academic motivation scale (AMS) within the context of Pakistani higher education and (2) determine the dominant types of motivation among university students in Pakistan. For the first objective, confirmatory factor analysis was used. The results confirmed that the AMS possesses satisfactory reliability and validity. These findings provide support about the suitability of AMS suitable measure to determine students' academic motivation orientations. For further analysis, Self-Determination SDI Index was constructed using the scores overall AMS. The findings based on **Kruskal-Wallis one-way analysis of variance** of study showed that there exists no significant difference among male and female, however, the comparison of age groups confirmed different patterns of academic motivation across different age groups. Overall finds confirm that AMS is a valid and suitable tool to assess academic motivation among university students in Pakistan.
Keywords: Academic Motivation, Self-Determination Index, University Students, Pakistan

Introduction
The concept of motivation has been a focal point of exploration among psychologists due to its significant connection with social, cognitive, and biological regulation, as well as its profound influence on human behavior (Deci & Ryan,. 2008). Motivation is another mechanism by which individuals behave in specific ways to fulfill their desired objectives and goals. Studying different factors of motivation across various learning environments is essential (Ferrer et al,.2022). Nevertheless, researchers have overlooked the intricate nature of motivation by conceptualizing it as a singular or binary construct (Christiana et al., 2014; Zhou, 2016b). Gaining an understanding of how various student motivational profiles either support or impede the intention to graduate through systematic research could influence higher education and its practices (Laitinen et al., 2024). Within the field of educational psychology, substantial investigations have been carried out to comprehend student motivation, as it is frequently linked to critical outcomes such as student engagement,

adaptation, perseverance, seeking assistance, and performance, all of which are vital to educational success (Meece et al., 2006; Chong & Ahmed, 2012; Deci & Ryan, 2008; Ryan & Deci, 2000). While the majority of motivational studies have originated in different settings of school and work-place, there remains a dearth of attention to higher education environments, particularly concerning the reasons behind enrollment in tertiary education (Kember et al., 2008).

This area of investigation is especially significant in developing economies, where the educational attainment of the population is regarded as a crucial determinant of socio-economic progress (Kember et ., 2008; Bennett, 2004). Furthermore, exploring the motivations of university students for pursuing higher education offers valuable insights into fostering student retention in universities and encouraging careers aligned with their fields of study (Ballman & Mueller, 2008).

In exploring the academic motivation among the students, one of the most commonly used scale to is known as the Academic Motivation Scale (AMS-28) developed by Vallerand et al,. (1992) (Zhang et al., 2015). The AMS is based on the Theory of Self-Determination (SDT), which outlines various types of motivation that result in diverse outcomes. The significance of motivation in higher education participation is emphasized by Kember et al., (2012), who argued that both the nature of students' motivation to pursue a degree and its intensity impact their commitment and study methods throughout their academic journey.

Although the AMS has undergone extensive testing within the United States and European contexts, there have been limited efforts to verify its applicability in the Asian context, particularly among university students (Guay et al., 2015, Zhang et al., 2015). To address the existing literature gaps, this study seeks to perform statistical analysis to confirm the validation of the AMS among university students in Pakistan. Additionally, the research aims to identify the most dominant types of motivation exhibited by Pakistani university students. The objectives of this study are:
1. Validate the psychometric properties of AMS among university students in Pakistan.
2. Identify the most dominant types of motivation exhibited by Pakistani university students in the context of pursuing higher education.

The Self-Determination Theory Framework
Self-Determination Theory (SDT) is a prominent framework in psychology for understanding human motivation, extensively validated and applied across diverse domains such as education, health ,sports and parenting (Ryan & Deci, 2000; Deci & Ryan, 2008). This theory emphasizes that to comprehend why individuals engage in specific activities or adopt certain behaviors, it is essential to differentiate between various types of motivation, as they result in distinct outcomes (Ballmann & Mueller, 2008).

Autonomous motivation stems from self-directed regulation, encompassing intrinsic motivation and a form of extrinsic motivation where individuals recognize and internalize the value of an activity, integrating it into their identity (i.e., identified regulation). For example, a person may pursue higher education driven by an innate curiosity, excitement for acquiring new knowledge, striving for achievement, or internalizing the significance of such pursuits. Conversely, controlled motivation involves external influences, such as extrinsic motivation

shaped by external rewards or penalties (external regulation) and introjected regulation, where actions are motivated by a desire for approval, avoidance of guilt, or contingent self-worth (Deci & Ryan, 2008). A student who is enrolled in college/ university only because of the fear of unemployment, familial expectations, or societal norms about being a "good" person exemplifies controlled motivation in their educational journey.

Although both autonomous and controlled motivations can stimulate and guide behavior, amotivation represents a state where intention and motivation are absent. Students in this condition may fail to perceive a connection between their actions and desired outcomes, leading to feelings of inefficacy and lack of control. Consequently, they might view education as unsuitable for them and withdraw from academic endeavors. Compared to controlled motivation and amotivation, autonomous motivation is associated with enhanced psychological well-being, persistence, satisfaction, engagement, and overall life satisfaction.

Methods
The population focus group of this study was bachelor's final semester students studying in public sector universities in Quetta. Data was collected by the online survey method the total number of students enrolled in bachelor's degree program's final semester in all public sector universities were N=1582.The online questionnaires were sent total population (N = 1582), and a total of 651 responses were received.

Ethical Approval
The researcher sought and received ethical clearance from JKEUPM. This involved submitting all required documentation for review. The Ethical Committee granted approval for the proposed study, and the researcher commenced the study only after receiving the approval letter. This letter is included in the final section of this document

Table 1
Demographic Details

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	313	48.2	48.2	48.2
	2	337	51.8	51.8	100.0
	Total	650	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	616	94.8	94.8	94.8
	25-30	11	1.7	1.7	96.5
	31-35	11	1.7	1.7	98.2
	36-40	12	1.8	1.8	100.0
	Total	650	100.0	100.0	

Analysis
Descriptive Statistics
Table 2 presents over all means crores of the 7 constructs of AMS. Table 3 and 4 presents means comparison of all constructs with respect to age and gender.

Comparison of Motivational Orientation Means by Gender
As shown in Table 3, gender 1 demonstrated higher scores in Intrinsic Motivation dimensions, specifically IMTK (3.69) and IMTA (3.38), compared to Gender 2, which scored higher in IMTE (3.71). This indicates that Gender 1 may be more motivated by knowledge acquisition and accomplishment, while Gender 2 is driven more by experiencing stimulation. In terms of Extrinsic Motivation, Gender 1 showed consistently higher scores across EMIN (3.78), EMID (3.51), and EMER (3.61), suggesting stronger extrinsic motivational factors such as incentives and rewards. However, Gender 2 scored higher in Amotivation (2.10) compared to Gender 1 (1.82), implying that Gender 2 may experience slightly more disinterest or a lack of purpose in motivation-related activities. Overall, Gender 1 exhibited stronger motivation across most dimensions, except for stimulation (IMTE) and amotivation, where Gender 2 had higher scores.

Table 3
Comparison of Motivational Orientation Means by Gender

Gender	IMTK	IMTA	IMTE	EMIN	EMID	EMER	AMOT
Gender 1	3.69	3.38	3.40	3.78	3.51	3.61	1.82
Gender 2	3.53	3.47	3.71	3.57	3.48	3.38	2.10
Total	3.62	3.42	3.55	3.68	3.50	3.50	1.95

Comparison of Motivational Orientation Means by Age
As shown in Table 4, the 25-30 age group displayed the highest scores across all intrinsic motivation subscales, including IMTK (4.50), IMTA (4.33), and IMTE (4.75), suggesting a peak in intrinsic motivation during this age range. In contrast, older age groups (31-35 and 36-40) exhibited lower scores in these subscales, indicating a potential decline in intrinsic motivational orientation with increasing age. Similarly, the 25-30 age group also had the highest scores in extrinsic motivation dimensions, with EMIN (4.50), EMID (3.75), and EMER (4.00), showing that external factors such as incentives and rewards are most influential in this group. On the other hand, the lowest scores in extrinsic motivation were observed in the 36-40 age group, with significant declines in EMIN (3.17) and EMID (2.00). In terms of amotivation, the 18-24 age group exhibited the highest score (1.98), indicating a slightly higher sense of lack of motivation compared to other groups. Interestingly, the 25-30 and 31-35 age groups showed the lowest amotivation scores (1.00), reflecting stronger motivational engagement across both intrinsic and extrinsic dimensions.

The results suggest that intrinsic and extrinsic motivation scores tend to correlate positively, with lower amotivation observed among those with higher scores in other dimensions. Gender 1 generally exhibited stronger motivation compared to Gender 2, while the 25-30 age group emerged as the most motivated across all dimensions. As age increases, motivation—both intrinsic and extrinsic—tends to decline, with amotivation slightly higher among younger participants (18-24) but significantly lower in middle-age groups (25-35).

Table 4
Comparison of Motivational Orientation Means by Age

Age Group	IMTK	IMTA	IMTE	EMIN	EMID	EMER	AMOT
18-24	3.62	3.44	3.56	3.69	3.53	3.51	1.98
25-30	4.50	4.33	4.75	4.50	3.75	4.00	1.00
31-35	3.17	2.58	3.17	3.17	2.50	2.83	1.00
36-40	2.83	2.08	2.00	3.17	2.00	3.00	1.83
Total	3.62	3.42	3.55	3.68	3.50	3.50	1.95

Scale Reliability Test
The type and level of academic motivation among university students was measured using AMS-28-, which is item scale with 7 components. These components included Intrinsic Motivation (to Experience Stimulation), Intrinsic Motivation (to Know), Intrinsic Motivation (towards Accomplishment), Extrinsic Motivation (Introjected Regulation), Extrinsic Motivation (Identified Regulation), Extrinsic Motivation (External Regulation), and Amotivation. 7-point Likert scales was used to rated each item on the scale. The Likert scale ranged from 1 to 7 where, 1 = does not correspond at all, and 7 = corresponds exactly. Each subscale had four items, giving scores between 4 and 28. A high score on a subscale showed strong agreement with that motivation type. Overall, the **Cronbach's alpha values** for all subscales ranged from **0.70 to 0.78**, indicating adequate to good internal consistency.

Following the reliability test using Cronbach's alpha, confirmatory factor analysis (CFA) was conducted using to evaluate the relationships between the item scores of all 7 constructs of AMS and their underlying latent constructs. Studies such as Tabachnick & Fidell, 2007, and Byrne, 2010) have mentioned that large sample size can affect the value of χ^2 and leads to vary high value, in such a situation other model fit statistics needs to be given higher consideration. Given the sample size of over 650 and the complexity of the constructs examined, the χ^2 value was expected to be large, with a very small p-value. Therefore, other model fit indices were considered critical for assessing model fit.

The initial analysis showed that the model fit was adequate ($\chi^2(345)$ = 750.321; $p < 0.01$; GFI = 0.92, AGFI = 0.90, CFI = 0.92, TLI = 0.91, RMSEA = 0.05). These indices indicated that the model met the threshold for acceptability without requiring additional modifications. Most of the model fit indices, including GFI, AGFI, CFI, and TLI, were satisfactory, while RMSEA also suggested a good fit. The construct validity of the model was confirmed, with Composite Reliability (CR) values exceeding 0.7 and Average Variance Extracted (AVE) values approximating 50%. The standardized loadings for the observed variables were greater than 0.5, indicating good item reliability, while the correlations between subscales remained below 0.9, ensuring adequate discriminant validity.

The relationships between the Intrinsic Motivation (IM) subscales and Extrinsic Motivation (Identified) were observed to be relatively high, as expected, reflecting their alignment with autonomous motivation. Conversely, these subscales showed low correlations with the Amotivation subscale, which was anticipated due to their distinct positions on the self-determination continuum. The results from the CFA validated the seven-factor structure of the Academic Motivation Scale (AMS). This outcome aligns with theoretical expectations and

confirms the scale's psychometric properties, supporting its application in assessing academic motivation.

Table 5
Factor Loading and Cronbach' Alpha

	Items	Factor1	Factor2	Uniqueness	Cronbach' Alpha
IMTk					0.72
	m2	0.607	-0.222	0.582	
	m9	0.644	-0.079	0.579	
	m16	0.683	-0.039	0.532	
	m23	0.704	0.049	0.501	
IMTA					0.7
	m6	0.373	0.244	0.501	
	m13	0.538	0.216	0.464	
	m20	0.548	0.280	0.622	
	m27	0.708	0.097	0.490	
IMTE					0.71
	m4	0.577	0.034	0.566	
	m11	0.250	0.521	0.566	
	m18	0.633	-0.003	0.599	
	m25	0.681	0.034	0.535	
EMIN	m3	0.670	-0.127	0.535	0.78
	m10	0.642	-0.058	0.584	
	m17	0.748	-0.096	0.431	
	m24	0.718	-0.034	0.483	
EMID					0.74
	m7	0.683	-0.018	0.533	
	m14	0.707	0.154	0.476	
	m21	0.476	0.384	0.526	
	m28	0.691	0.147	0.501	
EMER					0.7
	m1	0.420	0.218	0.650	
	m8	0.599	-0.166	0.637	
	m15	0.736	0.101	0.459	
	m22	0.627	0.190	0.571	
AMOT					0.71
	m5	-0.228	0.707	0.449	
	m12	0.174	0.614	0.593	
	m19	0.051	0.787	0.377	
	m26	-0.174	0.716	0.457	

Table							
Goodness Of Fit Test							
Chi-Square	Degrees of Freedom (df)	p-value	GFI	AGFI	CFI	TLI	RMSEA
750.321	345	<0.01	0.92	0.9	0.92	0.91	0.05

Self-Determination SDI Index
the next step is to construct Self-Determination Index (SDI), which is a composite score of AMS ranging between +18 to -18 to indicate the level of self-determination with higher score indicates high self-determination. The obtained score of Self-Determination index was then used to compare difference among different gender and age groups.

Mean different of SDI with respect to age and gender.
A **Kruskal-Wallis one-way analysis of variance (Table 6)** was conducted to explore the impact of **gender** on SDI levels. The sample data was divided into two gender groups: **Group 1 (Male)** and **Group 2 (Female).** There was **no significant difference** at p<0.05 in SDI scores between genders: $\chi2(1)=1.231$, p=0.2672. The rank sums for males (Group 1) and females (Group 2) were **104536.00** and **107039.00**, respectively. The adjusted test statistic with ties $\chi2(1)=1.232$, p=0.2670, further confirmed the absence of a significant difference. These results indicate that **SDI levels are comparable between males and females**, and gender does not have a significant impact on self-determination in this sample.

Table 6				
Kruskal-Wallis Results by Gender				
Gender	Obs	Rank Sum	Chi2	Prob
1	313	104536.00	1.231	0.2672
2	337	107039.00	1.232 (with ties)	0.2670 (with ties)

A **Kruskal-Wallis one-way analysis of variance** was conducted to explore the impact of **age** on SDI levels. Total four age groups, i.e., **Group 1 (18–24 years), Group 2 (25–29 years), Group 3 (30–34 years),** and **Group 4 (35+ years) were established to compare the age difference.** Results show that a statistically **significant difference** with p<0.05 in SDI scores across age groups: $\chi2(3)=18.12$, p=0.0004. The rank sums for the age groups were **203235.00** for Group 1**, 4348.00** for Group 2, **2404.00** for Group 3, and **1588.00** for Group 4. The adjusted test statistic with ties $\chi2(3)=18.138$, p=0.0004, confirmed the significant difference. These results suggest that **SDI levels vary significantly across age groups,** with post-hoc comparisons required to identify specific age groups with significant differences. Younger participants (Group 1) exhibited notably higher rank sums, indicating higher SDI levels compared to older groups.

Table 7
Kruskal-Wallis Results by Age

Age Group	Obs	Rank Sum	Chi2	Prob
1	616	203235.00	18.127	0.0004
2	11	4348.00	18.138 (with ties)	0.0004 (with ties)
3	11	2404.00		
4	12	1588.00		

The Cuzick's non-parametric test for trend was conducted to examine the relationship between age groups and mean response scores for SDI levels. The analysis indicates that SDI levels are significantly lower in older age groups compared to younger ones.

Table 8
Post Hoc test: Cuzick's Test Results by Age Group

Age Group	Group Score	Mean Response Score	Number of Observations
18–24	1	8.60	616
25–30	2	9.53	11
31–35	3	7.21	11
36–40	4	5.98	12

Discussion and Conclusion
The objective of the study was two folds, (1) first it aims to validate the psychometric properties of the AMS within the context of Pakistani higher education and (2) determine the dominant types of motivation among university students in Pakistan. For the first objective, confirmatory factor analysis results indicated that the AMS possesses satisfactory reliability and validity, supporting its use as a reliable and suitable measure to determine students' academic motivation orientations. These findings align with previous studies conducted to validation the AMS in their contexts e.g., Ratelle et al., 2007; Vallerand et al., 1992), further confirmed the applicability of the AMS for academic settings in Pakistan.

In recognizing the major forms of motivational orientation among university students in Pakistan, the results indicated notable variations in intrinsic and extrinsic motivation based on age and gender. Male students (Gender 1) exhibited higher intrinsic motivation for knowledge acquisition (IMTK) and accomplishment (IMTA), while female students (Gender 2) scored higher in experiencing stimulation (IMTE) (Al Ansari et al. 2021). Male students also demonstrated stronger extrinsic motivational orientations, including identified regulation (EMIN), introjected regulation (EMID), and external regulation (EMER), suggesting a higher reliance on external rewards and incentives. Conversely, female students reported higher levels of amotivation, reflecting a slightly greater tendency toward disengagement or lack of purpose in academic activities.

The age-wise comparison revealed that students aged 25–30 had the highest scores across both intrinsic and extrinsic motivational dimensions, indicating a peak in motivational engagement during this stage. In contrast, older students aged 31–35 and 36–40 exhibited significantly lower scores, suggesting a decline in academic motivation with age. Interestingly, while younger students aged 18–24 displayed moderate levels of intrinsic and extrinsic motivation, they also showed higher amotivation compared to the 25–30 age group, who

reported the lowest amotivation scores. This indicates that students in their mid-twenties are the most motivated, possibly reflecting a stronger focus on career and personal growth during this stage of life. In both genders, extrinsic motivation scores were slightly higher than intrinsic motivation. The overall results of our study indicate that women are more motivated than men. The results revealed that students are highly motivated in their second and fourth years, while they are less motivated in their final year.(Gul et al, 2023).

The self-determination index (SDI) analysis further underscored these patterns. While there were no significant differences in SDI levels between genders, significant differences were observed across age groups. Whereas (MK et al, 2019) found difference between genders among different types of motivation in SDT among college students. Moreover, a study in AJK college students shows that male students exhibit significantly lower levels of both intrinsic and extrinsic motivation but higher levels of amotivation compared to female students (Asif et al,2018). Younger students (18–24 years) displayed higher SDI levels, indicating greater self-determination, whereas older students (31–40 years) showed a marked decline in SDI. These findings highlight the influence of age on self-determination and motivation in academic settings.

The dominance of extrinsic motivation among Pakistani university students, particularly through identified and external regulatory reasons, reflects the broader societal emphasis on tertiary qualifications as a pathway to improved social and economic outcomes. Extrinsic motivators, such as the anticipation of better career prospects and higher salaries, align with the cultural and economic context of Pakistan, where higher education is often viewed as a means of upward mobility. However, intrinsic motivations, such as the pursuit of knowledge and personal accomplishment, remain significant, particularly among younger students. However, a study conducted in nursing college in Pakistan shows that students were extrinsically motivated, with external regulation factors like securing a good salary and a stable life ranking highest, while intrinsic motivation constructs such as curiosity and personal satisfaction were less prominent. (Fatima et al,. 2021).

As higher education in Pakistan expands and diversifies, motivational orientations among university students are expected to vary further due to demographic and contextual differences. While the AMS provides valuable insights into students' motivations, it is important to recognize that motivational orientations are multi-faceted and context-dependent. Future research could explore additional factors influencing motivation, such as cultural norms, familial expectations, and individual personality traits, to provide a more comprehensive understanding of academic motivation in Pakistan.

Recognizing motivation factors across various learning environments is essential. Doing so can offer actionable insights for educators to implement strategies that guide students toward suitable preventive measures and foster constructive learning attitudes. From a preventive perspective, it is crucial to identify, at an early stage, students who struggle with sustaining motivation and to comprehend the psychosocial factors shaping their motivational orientation, enabling timely intervention and support.

This study contributes significantly to the existing body of knowledge by validating the Academic Motivation Scale (AMS) within the cultural and educational context of Pakistan.

Theoretically, it expands the application of Self-Determination Theory (SDT) by demonstrating its relevance understanding motivational constructs in a non-Western setting. This research evaluates the psychometric properties of AMS and shows that it is a reliable tool for measuring academic motivation among university students, facilitating further cross-cultural comparisons. Contextually, this study highlights variations in motivational orientation across gender and age. These findings are particularly valuable for educators and policymakers in developing targeted interventions to enhance student engagement and retention in higher education. By addressing the underexplored cultural aspects of motivation, this research fills gap in the literature and sets a foundation for future studies in similar socio-cultural settings.

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