

Received: October 2023 Accepted: December 2023

DOI: <https://doi.org/10.58262/ks.v12i1.173>

Psychometric Properties of the Academic Identity Ranks Scale for Female University Students

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Abstract

The current research aimed to develop the academic identity ranks scale for female university students in the Egyptian environment and verify the scale's psychometric properties (internal consistency, validity, and reliability). The research sample consisted of (412) female students (mean age= 20.03, SD =0.83). For analyzing data, the following statistical methods were utilized: exploratory factor analysis, confirmatory factor analysis, Cronbach's alpha, composite reliability (CR), and Pearson's correlation coefficient. The results of the statistical analysis revealed the validity of the developed scale to measure academic identity ranks among the research sample. The confirmatory factor analysis revealed four components to the ranks of academic identity: diffused identity, moratorium identity, foreclosed identity, and achieved identity. The academic identity scale was also characterized by a high degree of internal consistency, validity, and reliability. Research recommendations and suggestions for further research were presented in light of the research results.

Keywords: *psychometric properties, academic identity, university students*

1. Introduction

The academic identity of university students is one of the most significant variables that contribute to explaining their academic and psychological status. Identity is formed and developed with age until it stabilizes and differentiates in late adolescence. Adolescence and youth are often described as the period of identity formation when they are exposed to life stresses that involve problems contributing to a low level of adaptation and psychological well-being (Sharma & Chandiramani, 2021).

Erikson (1968) proposed the concept of identity formation through his theory of psychosocial development. Erikson believed that ego development extends beyond childhood and that identity formation continues throughout an individual's life with a major identity crisis occurring during adolescence. Erikson identified eight crises that an individual faces throughout his life. During the period of study at the university or late adolescence, the individual faces a crisis between

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identity fulfillment and identity conflict (Roazen, 1976). The main problem at this stage is to form a sense of identity, that is, to confirm who he is, what his role in society is, what his abilities and potentials are, and how they can be invested. Marcia (1980) argues that identity is self-construct. It is an effective coordination of motives, tendencies, attitudes, and convictions, inherent in a person's history, which indicate the end of childhood.

The university stage is one of the most important age stages that influence the building of identity, Where the positive academic identity is linked to the academic, psychological, and social adjustment in the university environment (Billot, 2010, 711). The development of identity plays a sensitive and important role when entering the university education stage. Through it, students are integrated into their world and can have a significant impact on the decision-making process, and this is certain during transitional periods (Mahasna & Al-Azmat, 2018).

Identity is defined as a dynamic self-constructed and internalized organization of individual motivations, abilities, beliefs, and history (Marcia, 1993). It reflects the personal commitment to the standard of excellence, willingness to continue facing the challenge, struggle, excitement, and address feelings of disappointment, which are essential elements in the learning process (Welch & Hodges, 1997). Academic identity patterns are also defined as the individual's self-perception in academic situations, through his commitment to roles and values in the academic framework to which he belongs and interacts with him (Billot, 2010).

Academic identity includes a set of ideas and beliefs that the student has about himself, his social relations in his academic framework, and his professional orientations in the future (DeCandia, 2014). These perceptions reflect the student's ability to complete academic tasks. Besides, Lotfy (2021) defined it as the student's ability to discover his academic values, beliefs, and goals, and the extent of his commitment to academic practices and adoption of effective methods that would lead him to achieve his educational goals, while Abdellatif (2023) defined it as the individual's view and self-perception in academic situations through his exploration of academic goals and values, and his commitment to accomplish his academic tasks.

The study of the ego identity began as an attempt to test the validity of the fifth stage (Erikson, 1959), which falls within the framework of his theory of psychosocial development (the stage of adolescence). Marcia developed the concept of identity formation as an attempt to study personality at this stage and provided criteria for estimating identity patterns, which are intended to be used with late adolescent individuals between 18-22 years, given that the dual processes of exploration and commitment are the primary assessment considerations.

At this time, Marcia (1980) explained that exploration of alternatives and commitment are specific dimensions of identity. He defined exploration as a problem-solving behavior that facilitates the process of the individual making important decisions within a set of alternatives, and the exploration process takes place through the individual's cognitive ability, activity, and desire to make a decision and commitment as the individual's adoption of a set of goals, values, and beliefs and his commitment to them. Marcia ensured exploration and engagement within the four modes of identity. The building and strengthening of identity depend on the degree of exploration and commitment. These four patterns are as follows:

- Diffused Identity: It is the negative pattern of identity. include low exploration, and low commitment to their college education. Individuals with this pattern tend to be random and indifferent. They do not have clear academic goals or priorities, cannot make decisions, are indifferent and mismatched, do not integrate into their academic assignments, and have an external locus of control.

- **Moratorium Identity:** It is a prerequisite for achieving identity. It involves high exploration and low commitment to their university education. Students of this pattern hesitate and procrastinate. They try to reach conclusions about their academic values and goals through active exploration and research, and at this stage, they critically examine life choices. However, they have a poor commitment to academic tasks, feel anxious and have a low level of satisfaction with studies, face a lot of pressure, and are progressing towards an achievement pattern.
- **Foreclosed Identity:** It involves low exploration and high commitment to their university education. Students in this pattern are characterized by closed-mindedness. They unintentionally commit to a set of academic goals and values that have been set for them by others without exploring them. Individuals in this pattern adopt the rules, laws, choices, and beliefs of others, have ideal relationships with their parents, and are dependent on customs and traditions.
- **Achieved Identity:** It is the best identity pattern. It involves high exploration and commitment to their academic goals and values. Students of this pattern are characterized by the development of identity. They are rational in decision-making and can plan, and these students are also highly regarded. They work effectively under pressure and are also distinguished by deep social relationships with others, and normal psychological adjustment (Meshrif, 2017; Mahasna & Al Azmat, 2018; Lotfy, 2021; Marcia, 1980; Marcia, 2002; Was & Isaacson, 2008; Luyckx et al., 2012; Sharma & Chandiramani, 2021; Dastjerdi et al., 2022; Yukhymenko-Lescroart & Sharma, 2022).

Identity is a basic and necessary element in the educational process and a predictor of achievement motivation. It is also one of the fundamental pillars of people's behavior, their way of thinking, and logic, especially when facing problems, whether they are life situations or academic problems (Al Wahidi, 2012).

Students' identity is also a positive predictor of all dimensions of life quality (Cakir, 2014). It is the lens through which students engage in their world and it can have a significant impact on the decision-making process (Mahasana & Al Azamat, 2018). It plays a significant role in university students' awareness of their academic abilities, capabilities, attitudes, and interests. This is reflected positively in their social interactions, involvement in the university experience, participation in educational activities, and adaptation to university life, which has a very important impact on academic achievement and the development of their professional identity later (Lotfy, 2021).

Identity, with its multiple roles, is a central concept in personality psychology, through which the individual's attitudes, orientations, and goals are formed, and is linked to self-esteem and life satisfaction (Al Hamidi & Al Balushi, 2018). Various studies investigated the positive impacts of identity indicating its positive correlation with psychological adjustment (Luyekx et al., 2012), general life satisfaction (Al Saadi, 2018), and high academic performance (Abdi & Zandipayam, 2019).

Furthermore, achieved identity which correlates with confidence and independence is negatively correlated with poor effectiveness and negativity in college life and academic practice (Shiraishi & Okamoto, 2005). It also correlates positively with psychological well-being (Sharma & Chandiramani, 2021; Al Harthy, 2015; Bernabé et al., 2014).

Dastjerdi et al. (2022) indicated that identity is one of the most important issues during adolescence and that the achieved identity contributes greatly to the dimensions of

psychological well-being, and the family, school, and media play a major educational role in providing appropriate support during growth, which contributes to achieving the achieved identity.

Marcia (1980) identified the formation of identity in four types, based on two main dimensions: exploration (the presence or absence of an identity crisis), and commitment (the extent of commitment to the chosen values, standards, beliefs, goals, and social roles). Each type of identity reflects the adolescent's ability to deal with problems related to his goals and roles, and then the possibility of reaching a fixed meaning for himself and his existence and this would help to avoid various problems whose impact includes the individual and society (Meshrif, 2017).

It is clear from the above that academic identity is one of the variables that contribute to academic performance and positive feelings towards the university environment, and that the university stage is one of the most important stages in the formation of identity.

For measuring identity, the Marcia interviews that based on clinical interviews that were developed into an Objective Measure of Ego Identity Status (OMEIS) by Adams et al. (1968-1979) in three forms (A), (B), and (C), which seals with the four identity states (inquiry, delay, closure, and distraction) through the self-reported method that characterized by simplicity and ease (Al Wahidi, 2012).

Since Erikson and Marcia neglect the cognitive and ethical aspects, and focus only on aspects of personality social development; Berzonsky (2019) suggested that individuals differ in the social cognitive processes they use to form and maintain their identity, so Crocetti and Shokri (2010) built a list of Identity Styles Inventory (ISI) to understand identity states and forms. Berzonsky proposed three styles of identity: the informational style, the normative style, and the diffused/avoidant style (Lile, 2015).

Berzonsky and Papini (2015) indicated in their study that identity processing methods reflect different socio-cognitive strategies and focus on processing information that contributes to determining the sense of personal, social, or collective identity of individuals. Then Meeus et al. (2011) show that identity formation and refinement take place through a repetitive process in which commitment is explored and commitment re-examined (Piotrowski and Brzezińska, 2011).

With the increasing and contradictory scientific findings of research studies, Luyckx et al. (2005) expanded a four-dimensional model of identity formation based on Marcia's model, by extending the dimensions of identity exploration and commitment. After that, Luyckx and his colleagues conducted another development to the dimensions of identity by adding the dimension of ruminant exploration to become the scale in five dimensions (Luyckx et al., 2008).

Some attempts, such as Abdel Rahman's (1998) study, verifies Adams and his colleagues' Status Identity Scale on the Egyptian environment. Al-Ghamdi also legalized it in 2001 in the Saudi environment. The Berzonsky Identity Styles Scale was also codified in the Jordanian environment. By reviewing the research literature in this field, the researcher found that there is no research dealing with the psychometric properties of the scale of academic identity ranks among university students in the Egyptian environment according to the Was and Isaacson scale, 2008.

University students face many psychological, social, and academic challenges and pressures, which may be reflected in their beliefs about their academic identity through the researcher's

work in the field of teaching, he noticed a variance between female students in their beliefs about their academic identity, and then the researcher believes that the academic identity of female students may differ from the academic identity of male students.

This difference was confirmed by various study results indicating that females precede males in forming and developing identity (Meeus et al., 2011); as females trying to develop their goals and hopes in more than one dimension at the same time, as well as their ability to adapt to the state of maturity, and their awareness of social relations, which is the most important aspect in developing female identity (Al Balushi, 2014). While others stated that the gender differences in identity development were unclear and inconsistent in many studies (Echabe, 2010).

Academic identity differs also according to different cultures (Mussen, 1984), and a university degree as the university is the period of postponement after which the adolescent determines his identity (Kafafi, 2009), the individual's cognitive abilities (Mussen, 1984), and ideological influences (Schiedel & Marcia, 1985).

Hence, the current research aimed to develop the academic identity ranks scale for female university students in the Egyptian environment and verify the scale's psychometric properties (internal consistency, validity, and reliability). This study also comes to enrich the Arab library by providing a measure of the academic identity of psychological and educational heritage and those interested in the educational process in light of the philosophy of contemporary Arab society.

Therefore, the research problem can be determined by the following main question: What are the psychometric characteristics of the university students' academic identity ranks scale? and the following sub-questions emerge from this question:

1. What are the components of the academic identity ranks scale for female university students?
2. Does the academic identity rank scale under current research have acceptable internal consistency coefficients?
3. Does the Academic Identity Rank Scale have acceptable validity coefficients?
4. Does the Academic Identity Rank Scale have acceptable reliability coefficients?

2. Methods

2.1. Research Model

The current research utilized the descriptive research approach as it is the most suitable approach for the research objectives.

2.2. Study Group

The research tool was applied to a sample consisting of (384) female students from Al Azhar University (mean age= 20.03, SD= 0.83) to verify the academic identity ranks scale psychometric properties and they were chosen randomly.

2.3. Data Collection Tools

The academic identity scale for university students was developed by the researcher. The scale consisted of (20) items distributed into four patterns (diffused identity moratorium identity, foreclosed identity, and achieved identity). Participants choose from five alternatives ranging from strongly agree to strongly disagree. A high degree indicated a high level of students' identity patterns. The score of each pattern ranges from 5 to 25.

The scale was presented to (5) psychology and mental health professors as jury members to judge the suitability of the statements to measure university students' academic identity. They agreed (80-100%) on the scale statements while paraphrasing some of them. The scale psychometric properties were verified as indicated in the research results.

2.4. Data Analysis

To analyze the results of the current study, IBM SPSS v.20 and Mplus v.7 programs were used, and the following statistical methods were used: means and standard deviations, Pearson correlation coefficient, Cronbach's alpha, Exploratory factor analysis, and Composite reliability (CR).

3. Results

3.1. Testing the First Hypothesis

The first hypothesis is developed as follows: 'The academic identity rank scale has acceptable internal consistency coefficients. To verify the validity of this hypothesis, Pearson's correlation coefficient was calculated between the score of each statement with the total score of the dimension to which it belongs, the following table shows the internal consistency of the academic identity scale.

Table 1. Internal Consistency for Academic Identity Scale.

Dimensions	Items	Correlation With Dimension	Dimensions	Items	Correlation With Dimension
Diffused Identity	1	0.494	Foreclosed Identity	11	0.577
	2	0.649		12	0.651
	3	0.636		13	0.646
	4	0.664		14	0.524
	5	0.581		15	0.659
Moratorium Identity	6	0.709	Achieved Identity	16	0.530
	7	0.525		17	0.640
	8	0.657		18	0.701
	9	0.576		19	0.595
	10	0.653		20	0.494
All correlation coefficients in the table are significant at (0.01)					

Table 1 indicates that all the values of the correlation coefficients are significant at the (0.01) significance level, which confirms the internal consistency of the items with their patterns, and this means that the scale in general has good internal consistency and can be relied on upon.

3.2. Testing the Second Hypothesis

The second hypothesis is developed as follows: 'The academic identity rank scale has acceptable validity coefficients'. To verify the validity of this hypothesis, the following validity methods were examined:

3.2.1. Construct Validity

To verify the construct validity of the academic identity, the scale of the exploratory and confirmatory factor analysis was utilized. The sample was divided randomly into two groups of an equal number of individuals, each of which was (192) students, to conduct the exploratory

factor analysis on one of the two groups and the confirmatory factor analysis on the other group as indicated in the following tables.

3.2.2. Exploratory Factor Analysis

It was conducted through the principal axis factoring, where Bartlett's test was 1732.43 with $df = 190$ and Kaiser-Meyer-Olkin (KMO) test = 0.874. According to the factor analysis of a large-item pool representing this domain, four specific factors were identified (diffused identity, moratorium identity, foreclosed identity, and achieved identity). The results revealed that the four factors have 53.34% of the total variance. Furthermore, Promax rotation demonstrated that the factor loadings of items ranged between 2.311 and 3.040, confirming the verification of the scale's structural validity. Table 2 illustrates the academic identity scale factor loadings on the four dimensions after rotation.

Table 2: Exploratory Factor Analysis of the Academic Identity Scale.

Items	Factors				Communalities
	1	2	3	4	
1	0.155	0.652	0.207	0.044	0.494
2	0.028	0.678	0.232	0.005	0.514
3	0.053	0.617	0.201	0.058	0.427
4	0.104	0.683	0.076	0.076	0.489
5	0.223	0.778	0.261	0.053	0.726
6	0.182	0.280	0.619	0.013	0.495
7	0.112	0.171	0.562	0.065	0.362
8	0.070	0.219	0.726	0.139	0.599
9	0.063	0.080	0.737	0.138	0.573
10	0.006	0.238	0.620	0.198	0.480
11	0.099	0.120	0.169	0.656	0.483
12	0.305	0.225	0.004	0.584	0.485
13	0.145	0.086	0.236	0.746	0.641
14	0.001	0.118	0.195	0.630	0.449
15	0.063	0.214	0.076	0.674	0.510
16	-0.660	-0.215	-0.057	-0.146	0.506
17	-0.699	-0.172	-0.173	-0.046	0.550
18	-0.836	-0.083	-0.050	-0.053	0.711
19	-0.725	-0.021	-0.059	-0.099	0.539
20	-0.788	-0.094	-0.071	-0.011	0.635
Eigenvalue	3.040	2.780	2.537	2.311	Total variance = 53.34%
Variance (%)	15.20	13.90	12.68	11.56	
Latent Root	3.040	2.780	2.537	2.311	
Explanatory variance	15.20	13.90	12.68	11.56	

3.2.3. Confirmatory Factor Analysis

The confirmatory factor analysis of the academic identity scale was carried out using the diagonally weighted least squares (DWLS) method due to its suitability for the data that follow the Likert scale. The measurement model for the academic identity scale was tested, and the measurement model consists of (20) items distributed on four dimensions. Table 3 illustrates the goodness of fit indices to the confirmatory factor analysis model of the academic identity scale.

Table 3. Model Fit Statistics for Academic Identity Scale.

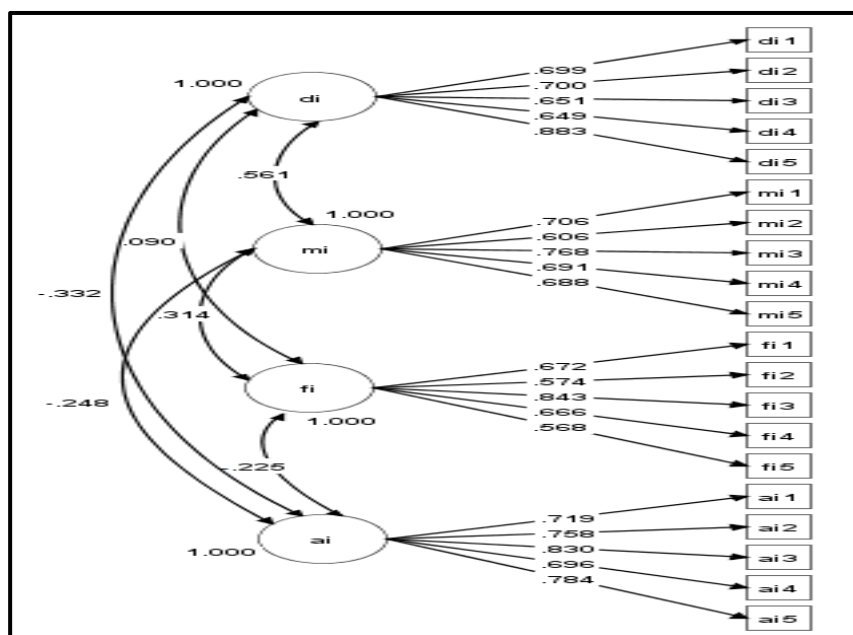
The goodness of fit indices	Value	Acceptable value*
Chi-square	480.54	Chi-square/degrees of freedom < 3
Degrees of freedom	164	
Chi-square/degrees of freedom	2.930	
Tucker-Lewis Index (TLI)	0.964	NFI ≥ 0.95
Comparative Fit Index (CFI)	0.982	CFI ≥ 0.95
Root Mean Square Error of Approximation (RMSEA)	0.078	RMSEA < 0.08

The results presented in table 3 illustrate that all fit indices are all good and acceptable. Table 4 illustrated the loading values and their statistical significance for the items of the academic identity scale according to the confirmatory factor analysis model.

Table 4. Confirmatory Factor Analysis for Academic Identity Scale.

Ite ms	Standardized Regression Weights	Standard Error	Z Value	Ite ms	Standardized Regression Weights	Standard Error	Z Value
Diffused Identity				Foreclosed Identity			
DI1	0.699	0.036	19.43	FI1	0.672	0.038	17.89
DI2	0.700	0.035	20.18	FI2	0.574	0.044	13.03
DI3	0.651	0.035	18.41	FI3	0.843	0.029	29.17
DI4	0.649	0.038	17.02	FI4	0.666	0.038	17.74
DI5	0.883	0.025	35.38	FI5	0.568	0.039	14.70
Moratorium Identity				Achieved Identity			
MI1	0.706	0.030	23.24	AI1	0.719	0.033	22.07
MI2	0.606	0.039	15.50	AI2	0.758	0.031	24.56
MI3	0.768	0.030	25.91	AI3	0.830	0.022	38.41
MI4	0.691	0.034	20.18	AI4	0.696	0.030	23.10
MI5	0.688	0.034	20.50	AI5	0.784	0.027	28.75

P values for All z values in the table = 0.000

**Figure 1.** The Structural Model of the Academic Identity Scale Obtained With CFA.

The results revealed that the factor loading values were greater than 0.4 and statistically significant at the level of 0.01, which confirms the structural validity of the academic identity scale.

3.2.4. Discriminant Validity

A comparison between the upper category (the highest 25%) and the lowest category (the lowest 25%) of the respondents on the total score of the pilot sample on the scale was conducted. Table 5 shows this comparison.

Table 5. Discriminant Validity for Academic Identity Scale.

Dimensions	Group	N	Mean	Standard Deviation	Df	T Value	P Value
Diffused Identity	Highest	48	16.96	3.24	94	13.27	<0.01
	Lowest	48	9.35	2.30			
Moratorium Identity	Highest	48	20.63	2.62	94	15.61	<0.01
	Lowest	48	11.52	3.07			
Foreclosed Identity	Highest	48	20.73	2.27	94	14.09	<0.01
	Lowest	48	12.38	3.43			
Achieved Identity	Highest	48	21.10	2.70	94	4.03	<0.01
	Lowest	48	14.15	4.32			

Results presented in table 5 indicated that all the values of "t" are statistically significant at the level (0.01), which indicates the discriminatory validity of the academic identity scale and this confirms its validity for application.

3.3. Testing the Third Hypothesis

The third hypothesis is developed as follows: "The academic identity rank scale has acceptable reliability coefficients. To verify the validity of this hypothesis, the following reliability methods were utilized:

3.3.1. Cronbach's alpha coefficients

To define the scale reliability, Cronbach's alpha coefficients were calculated, where the values of the reliability coefficients of the academic identity scale and its dimensions were greater than 0.7 as presented in table 6, confirming the scale reliability.

Table 6. Reliability With Cronbach's Alpha for Academic Identity Scale.

	Academic Identity Scale	Coefficient Alpha
1	Diffused Identity	0.796
2	Moratorium Identity	0.817
3	Foreclosed Identity	0.774
4	Achieved Identity	0.782

3.3.2. The Composite Reliability

The composite reliability that refers to the ratio of the variance in the real score to the variance in the total score was calculated according to the following equation (Kline, 2015, 313):

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + (\sum \epsilon_i)}$$

CR: Composite reliability coefficient, λ_i standardized regression weights (saturation resulting from confirmatory factor analysis), ϵ_i standard error.

Table 7. Composite Reliability for Academic Identity Scale.

Academic Identity Scale		Composite Reliability (CR)
1	Diffused Identity	0.843
2	Moratorium Identity	0.822
3	Foreclosed Identity	0.801
4	Achieved Identity	0.871

Results presented in table 7 illustrate that the composite reliability coefficient (CR) for the academic identity scale was all greater than (0.7), which indicates the structural reliability of the scale.

4. Discussion

The results of the current research reached the acceptable psychometric of the academic identity ranks scale to measure the academic identity ranks of university students. The results of the factor analysis revealed that there are four components of academic identity ranks: diffused identity, moratorium identity, foreclosed identity, and achieved identity. The scale also was characterized by a high degree of internal consistency validity, and reliability, indicating the possibility of trust and reliance on it.

These components agree with the components reached by the results of the different studies (Adams et al., 1987; Was & Isaacson, 2008; Abdel Rahman, 1998; Atallah, 2007). The researcher believes that these cases and ranks are the same as those found in previous studies and that the study sample is similar in the psychological and cognitive characteristics experienced by male and female university students without any distinction between them.

This was explained also by Ozkan et al. (2011) and Al-Hefny (1994) that identity is a specific internal dynamic organization of needs, motivations, abilities, beliefs, and self-perceptions. Besides, the better this organization, the more the individual is aware of his uniqueness, and the more aware of his strengths and weaknesses. Thus, if this organization is not good, the individual becomes more confused about his exclusivity from others, depends heavily on others for his self-esteem, and loses confidence in himself.

Identity states can also be viewed in an evolutionary sequence, but none of them is necessarily antecedent or deterministic of any other. At a certain time, the individual is in one of the four ranks of identity, and over time, the same person may change and be classified in another rank. Individuals may move from a state of foreclosed identity to a state of moratorium identity for reasons attributable to entering a university that promotes and encourages discovery. This was confirmed by many longitudinal studies revealing that the tendency of an adolescent with a foreclosed or distracted identity changed with age towards moratorium or achieved identity.

In light of the foregoing, it is clear that the current scale of academic identity ranks can reveal the level of academic identity ranks among female university students. The validity of the scale confirmed the quality of the scale content in measuring academic identity ranks, and that it has the discriminatory ability that distinguishes between the four academic identity ranks (diffuses, moratorium, foreclosed, and achieved). Results also confirmed \the constructive validity of the scale through the use of exploratory and confirmatory factor analysis, as well as verify the

validity of the peripheral comparison (discriminatory validity) of the scale, and all values were statistically significant at the level (0.01) this confirms its validity for application. Concerning the scale reliability, the results indicated that the reliability coefficients using Cronbach's alpha method and the composite method of reliability ranged between (0.715 - 0.933).

5. Conclusion

In light of the current research results, the scale of academic identity ranks among university students in the Egyptian environment has high psychometric indicators that allow it to be used to find out the extent to which students have an academic identity. Through the use of the current scale, those in charge of the educational process can reveal the ranks of academic identity among female students, and then pay attention to supporting and developing the (achieved) achieved among them at the university level in the Egyptian environment, and direct attention to the interest in creating a learning and educational environment that guarantees and develops ranks of academic identity (achieved) they have.

Acknowledgment

"This study is supported via funding from Prince sattam bin Abdulaziz University project number (PSAU/2023/R/1445) "

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