Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

https://doi.org/10.23913/ride.v16i32.2926

Scientific articles

Validación del instrumento escala ética del dinero (M.E.S) y escala de actitudes hacia el dinero (EAD)

Validation of the Money Ethics Scale (M.E.S.) and Money Attitudes Scale (EAD) instruments

Validação dos instrumentos Escala de Ética Monetária (M.E.S.) e Escala de Atitudes em Relação ao Dinheiro (EAD)

Judith Banda Guzmán
Universidad de Guanajuato, México
j.bandaguzman@ugto.mx
https://orcid.org/0000-0003-0816-1653

Ángel Flores Ramos
Universidad de Guanajuato, México
angelflores616@outlook.com
https://orcid.org/0009-0006-3877-4177

Resumen

El presente estudio tuvo como objetivo validar la estructura factorial de la Escala Ética del Dinero (MES) y la Escala de Actitudes hacia el Dinero (EAD-6), complementando el análisis mediante la evaluación de su consistencia interna. La educación financiera enfocada en aspectos psicológicos, como las actitudes y creencias sobre el dinero, ha recibido escasa atención en la comunidad científica, lo cual se refleja en la limitada disponibilidad de modelos de medición estandarizados. Para este propósito, ambas escalas se aplicaron a una muestra de 169 estudiantes universitarios del Bajío Mexicano (38% hombres, 62% mujeres). El análisis factorial se realizó mediante el método de rotación oblimin. La adecuación de los datos se evaluó mediante el índice Kaiser-Meyer-Olkin (KMO) y la prueba de esfericidad de Bartlett, mientras que la fiabilidad se estimó mediante el coeficiente de alfa de Cronbach, obteniéndose valores de 0.584 para la escala MES y 0.918 para la escala EAD-6. Los resultados coincidieron con una estructura de cinco factores para la escala MES: presupuesto,

dinero malo, equidad, éxito y motivador con la eliminación del ítem Eq3 del factor equidad. En el caso de la escala EAD-6, se identificó una estructura de dos factores: Poder Social y Poder Personal. En conclusión, tras las modificaciones sugeridas, ambas escalas presentan validez factorial para su aplicación en la comunidad universitaria del Bajío Mexicano.

Palabras clave: actitudes hacia el dinero, estudiantes universitarios, validez estructural

Abstract

This study aimed to validate the factor structure of the Money Ethics Scale (MES) and the Attitudes Toward Money Scale (EAD-6), while also evaluating their internal consistency. Financial education that focuses on psychological aspects such as attitudes and beliefs about money has received limited attention in scientific literature, which is reflected in the scarce availability of standardized measurement models. To address this gap, both scales were administered to a sample of 169 university students from the Bajío region of Mexico (38% men, 62% women). Factor analysis was conducted using the oblimin rotation method. Data adequacy was evaluated through the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity, while reliability was estimated using Cronbach's alpha coefficient. The results yielded reliability values of 0.584 for the MES scale and 0.918 for the EAD-6 scale. The findings confirmed a five-factor structure for the MES scale: budget, bad money, equity, success, and motivator, with the elimination of item Eq3 from the equity factor. For the EAD6 scale, a two-factor structure was identified: social power and personal power. Overall, after the proposed modifications, both scales demonstrate factorial validity for application within the university community of the Bajío region of Mexico.

Keywords: financial education, university students, structural validity.

Resumo

Este estudo teve como objetivo validar a estrutura fatorial da Escala de Ética Monetária (MES) e da Escala de Atitudes em Relação ao Dinheiro (EAD-6), complementando a análise com a avaliação da consistência interna das escalas. A educação financeira com foco em aspectos psicológicos, como atitudes e crenças sobre dinheiro, tem recebido pouca atenção da comunidade científica, o que se reflete na limitada disponibilidade de modelos de mensuração padronizados. Para tanto, ambas as escalas foram aplicadas a uma amostra de 169 estudantes universitários da região do Bajío, no México (38% homens, 62% mulheres).

Revista Iberoamericana para la Investigación y el Desarrollo Educativo
ISSN 2007 - 7467

A análise fatorial foi realizada utilizando o método de rotação oblimin. A adequação dos dados foi avaliada pelo índice de Kaiser-Meyer-Olkin (KMO) e pelo teste de esfericidade de Bartlett, enquanto a confiabilidade foi estimada pelo coeficiente alfa de Cronbach, resultando em valores de 0,584 para a escala MES e 0,918 para a escala EAD-6. Os resultados indicaram uma estrutura de cinco fatores para a escala MES: orçamento, dinheiro ruim, equidade, sucesso e motivação, com a remoção do item Eq3 do fator equidade. Para a escala EAD-6, identificou-se uma estrutura bifatorial: Poder Social e Poder Pessoal. Em conclusão, após as modificações sugeridas, ambas as escalas demonstram validade fatorial para aplicação na comunidade universitária da região do Bajío, no México.

Palavras-chave: atitudes em relação ao dinheiro, estudantes universitários, validade estrutural.

Date Received: October 2025 **Date Accepted:** March 2026

Introduction

A review of the literature on financial education in Latin America has revealed several limitations in programs aimed at strengthening personal finance; although progress has been made in the theoretical teaching of financial concepts, this has not translated into effective practical application in daily life (López-Lapo *et al.*, 2022).

In Mexico, the national financial literacy index shows limited progress. Based on 2018 data, the indicator registered an increase of just one percentage point, rising from 57.62% to 58.63%, remaining below the G20 average (60.47%). Furthermore, this growth has not been uniform, as the increase in the financial knowledge component has offset the decline observed in the factors of financial behavior and attitudes. This highlights the need to strengthen dimensions that influence how people relate to money and make economic decisions. In this sense, the development of financial literacy is fundamental not only to expand access to financial services but also to promote changes in attitudes and behaviors that contribute to personal, family, and social well-being (Mungaray *et al* ., 2021).

Recent data on financial inclusion show that the proportion of adults with at least one financial product increased from 68% in 2021 to 77% in 2024; however, 16 % of the population still lacks access to the financial system. Furthermore, gaps persist among different population groups, particularly among young people aged 18 to 29, women, and those in informal employment, who exhibit lower levels of financial participation (CNBV, 2024).

Financial education refers to the set of knowledge, skills, and attitudes that enable individuals to understand financial concepts and make informed decisions to manage their economic resources effectively. According to the Organization for Economic Co-operation and Development (OECD), financial education involves a process through which individuals gain a greater understanding of financial products, risks, and opportunities within the financial system, allowing them to develop the necessary skills to improve their economic well-being and make responsible financial decisions (OECD, 2018). In this sense, financial education is not limited to technical knowledge about financial products but also includes behaviors and attitudes that influence spending planning, saving, and credit management (Huston, 2010).

Attitudes toward money refer to the evaluations, dispositions, and psychological orientations that people develop regarding money and its use in daily life. These attitudes influence how individuals perceive the value of money, its role in social relationships, and its importance in economic decision-making (Yamauchi & Templer, 1982). Various studies have shown that attitudes toward money can manifest in dimensions such as power, prestige, anxiety, and financial security, which condition saving, spending, and borrowing behaviors (Tang, 1992). Therefore, analyzing these attitudes allows us to understand how psychological factors influence people's financial behavior.

An analysis of the recent evolution of financial culture in Mexico has revealed a lag and stagnation in certain financial behaviors, such as saving, informal spending, and access to credit. Evidence of this includes a 7.66 percentage point increase in the adult population that does not save, a 9.1 percentage point decrease in those who save informally, and the use of cash as the primary form of payment, with up to 90.1% using it for payments under $500 and 78.7% for larger amounts (Cárdenas *et al* ., 2022).

According to the National Commission for the Protection and Defense of Financial Services Users (CONDUSEF), based on the National Survey on Financial Health (ENSAFI) , 50.8% of the adult population in Mexico has a low or medium level of financial well-being. Furthermore, 52% report having some type of savings and 32.6% have debt, while 56.1% state they have little or nothing earmarked for their financial future. Additionally, 45.9% indicate that they almost never or never end the month with money left over, and 36.9% experience high levels of financial stress (CONDUSEF, 2023).

Young Mexicans in the 18-29 age group have lower levels of asset ownership compared to other age groups. Data from the National Survey of Financial Inclusion (ENIF)

indicate that around 24% of this group owns some asset, such as a house, car, or land, a significantly lower proportion than that observed in older adults, which demonstrates the financial vulnerability of the young population in the early stages of their economic life (INEGI, 2018).

Although there is research that addresses financial education and its relationship with economic decisions, as well as studies that explore the relationship between personality traits, income and wealth generation —based on preliminary theories about behaviors towards money—, there are still few works that analyze in depth how beliefs about money influence financial decision-making (González, 2016).

People interact with each other through money to satisfy both their personal and social needs, thus making it a mediator of human behavior. However, the study of the psychology of money and other dimensions linked to everyday behavior has received little attention in scientific research, as most analyses come from disciplines such as philosophy, psychoanalysis, and even religion (Luna & Tang, 1998).

If the emotional dimension linked to financial beliefs is not addressed and understood, learning in this area loses depth and effectiveness. Even when a person acquires financial knowledge and technical tools, if a cognitive block regarding their economic progress persists, the results will remain limited (González, 2016).

Beliefs about money can be understood as the cognitive schemas and social representations that individuals construct regarding the meaning, value, and function of money in society. From the perspective of social representations, Moscovici (1979) points out that beliefs are shared systems of interpretation that allow individuals to understand and organize social reality. In the financial sphere, these beliefs influence how people interpret money and guide their economic decisions. Subsequent research has shown that such beliefs can be transmitted socially and culturally, influencing financial behaviors throughout the life cycle (Klontz, Britt, Archuleta, & Klontz, 2012). Consequently, beliefs about money constitute a fundamental component for understanding individuals' financial attitudes and behaviors.

In this regard, the Money Belief and Behavior Scale (MBBS), created by Furnham (1984), identified six factors associated with beliefs and behaviors toward money: power/spending, obsession, withholding, security-conservatism, desire to accumulate, and effort/ability. The results showed that men were more preoccupied with money compared to women, while young people perceived money as a means to gain power and showed less

caution in their spending. Meanwhile, Yamauchi and Templer (1982) identified five factors of attitudes toward money: power-prestige, holding time, mistrust, quality, and anxiety.

Subsequent research has also analyzed the relationship between money obsession and risk perception. In this regard, Engelberg and Sjöberg (2007) found that people with a greater obsession with money are more vulnerable to the risks of financial loss and manage their resources less securely. They also revealed that those with smaller budgets tend to overspend and take out loans. Furthermore, it was discovered that those who are less obsessive about money are more educated and do not see money as a means of influencing others.

Klontz Britt, Archuleta, and Klontz (2012) analyzed various dysfunctional money management behaviors, including compulsive hoarding, workaholism, financial dependence, financial enablement, denial, and financial entanglement. Their results show that these patterns are associated with different sociodemographic characteristics, income levels, education, and wealth, demonstrating the influence of psychological and social factors on financial behavior.

Following the line of thought regarding disordered and distorted money behaviors, Klontz and Britt (2012) pointed out that beliefs transcend generations, develop from childhood, and influence financial behaviors in adulthood. They categorized these beliefs and behaviors, which are negative for financial health, into: money avoidance, money status, and money worship. These belief patterns are associated with people who have low incomes and a higher amount of debt.

Historically, money has been considered an element capable of dissolving social life, functioning metaphorically as an “acid.” Wilkis (2015) points out that the concept of money as “a means to decipher the collective life of a society,” its possession and use, generate diverse social dynamics and alterations. Despite this, money also acts as a means to establish and maintain bonds between individuals, whether friendly, romantic, professional, or familial. From a social perspective, money can also be analyzed from three dimensions: struggle, comparison, and power (Moscovici, 1979).

In everyday economic life, people relate to money in various ways that go beyond its function as a medium of exchange. Luna (1998), cited in Denegri et al. (2012), points out that these relationships are expressed primarily through three practices: obtaining, saving, and consuming. Through these activities, money acquires a symbolic dimension by becoming linked to emotions, attitudes, and values that influence how individuals manage their financial resources and make economic decisions.

From a sociocultural perspective, several studies analyze beliefs and their influence on women's economic decision-making, as well as the relationship of these decisions to their self-realization, such as that of Zelizer and Vera (2013). The authors conclude that the social aspect significantly impacts the study participants, determining the prevalence of social beliefs over personal ones, creating experiential and emotional instability, and demonstrating that women are not satisfied. Money and self-realization appear to be separate; socially, we have created and widened this divide between the internal and external by failing to integrate the financial and the human aspects.

Along these same lines, Zelizer and Vera (2013) argue that economics has an irreducible cultural component, and that economic phenomena cannot be understood without it. They posit the need to integrate culture when analyzing economic phenomena, incorporating both shared meanings and their manifestation in objects and practices. From this perspective, it is crucial to consider culture as an explanatory dimension for understanding how people relate to money and construct behaviors around it.

Wilkis (2015), for his part, introduces the concept of moral capital, analyzing disputes over moral meanings regarding people and their actions, considering the accumulation of moral capital as a means of accessing resources and power. Moral judgments and evaluations are valued and weighed by individuals. Wilkis argues that moral hierarchies are constructed around money, which acts as a social classifier. Through it, people are evaluated and categorized with labels such as "payable," "loyal," "responsible," "respectable," "generous," "hardworking," or, conversely, "disloyal," "unreliable," "greedy," "lazy." These moral judgments are not neutral: they form part of symbolic disputes where individuals seek to legitimize or contest positions, thus defining the hierarchies that regulate and condition the circulation of money in society.

In the field of empirical research, the analysis of beliefs and attitudes toward money has led to the development of various measurement instruments. Among these, the *Money Ethics Scale* (MES), created in 1992, stands out and has undergone several modifications over time. Its main factors include budgeting, bad money, success, and motivator. However, the equity factor has shown some instability in terms of reliability. The rest of its factor composition—budgeting, bad money, success, and motivator—on the other hand, has demonstrated reliability even above 0.8 in its Cronbach's alpha coefficient (Zamora Lobato, Tejeda Hernández, & Borroto-Pentón, 2021).

On the other hand, the Attitudes Toward Money Scale (EAD) has greater empirical support compared to the MES scale. Naturally, as it is a measurement instrument, its variables and number of items have been altered during its refinement. However, its two-dimensional structure—social money and personal money—has been maintained throughout this development, confirming its reliability with levels exceeding alpha 0.8 (Rodríguez & Martins, 2022).

Despite efforts in Latin America to strengthen financial education, evidence shows that progress in the theoretical teaching of finance does not always translate into the effective practical application of these skills in people's daily lives. In Mexico, available indicators show limited growth in the financial literacy index, as well as persistent difficulties in behaviors related to saving, credit use, economic planning, and financial well-being. Although financial inclusion has increased in recent years, significant gaps remain among certain population groups, particularly young people, women, and those in informal employment.

In this context, several studies have indicated that economic decisions depend not only on financial knowledge but also on psychological and sociocultural factors, such as attitudes, beliefs, and perceptions toward money, how people manage their resources, and how they make decisions in their daily lives. However, empirical studies analyzing these variables from a psychometric perspective are still limited and focused on specific contexts, especially among university populations in Mexico.

Given this situation, it is necessary to have valid measurement instruments that allow us to evaluate attitudes and beliefs related to money in specific sociocultural contexts. In this regard, scales such as the Money Ethics Scale (MES) and the Attitudes Toward Money Scale (EAD) have been widely used in different countries to analyze perceptions and values associated with money. However, these instruments have been adapted to specific populations, and their results and conclusions are limited to the characteristics of those samples. Since these instruments have been developed and adapted for diverse populations, their application in new contexts requires validation processes to guarantee their reliability and factorial validity.

Therefore, the objective of this research is to analyze the factorial validity and internal consistency of the *Money Ethics Scale* (MES) and the Scale of Attitudes towards Money (EAD) in university students from the Mexican Bajío region, with the purpose of evaluating

the relevance of these instruments to measure attitudes, beliefs and perceptions towards money in this population.

Materials and methods

The present study aimed to analyze the factor structure and internal consistency of the *Money Ethics Scale* MES and the Scale of Attitudes towards Money (EAD) in university students from the Mexican Bajío region.

Participants

The study was conducted using non-probability convenience sampling, due to the accessibility of the participants and their voluntary willingness to respond to the instrument. From a total population of 5,504 students at a public university in the Bajío region of Mexico, a sample of 169 participants (38% men and 62% women) was selected, with a 95% confidence level and a 10% margin of error. The average age of the participants was 21 years (SD = 2.12). The students belonged to various academic programs, including engineering, digital arts, and business management, and agreed to participate voluntarily in the study. IBM SPSS Statistics version 23 was used for data processing and statistical analysis.

Instrument

As part of the data collection process, prior to the application of the main instrument, a sociodemographic questionnaire was administered in order to obtain basic information from the participants, such as age, sex and educational program.

The *Money Ethics Scale* (MES) was originally developed in 1992 by Li-Ping Tang and subsequently updated in 1997 in collaboration with J. Whiteside, resulting in a more concise version composed of five factors and 15 items. These factors correspond to Budgeting (4 items), Bad Money (4 items), Equity (3 items), Success (2 items), and Motivator (2 items) (Luna & Tang, 1998). This version of the scale was used in the present study. The items are rated using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (Tang & Whiteside, 1997).

In addition, the Attitudes Toward Money Scale (EAD) was administered. This scale has several versions derived from the original proposal developed by Luna, Quintanilla, and Díaz (1995). The EAD-6 version was used in this study. Its items are answered using a six-point rating scale, ranging from 1 to 6, based on the participant's level of identification with

each item. The instrument comprises two main factors: Social Power (6 items) and Personal Power (6 items). The latter is divided into two subdimensions: Happiness (3 items) and Wealth (3 items) (Luna & Tang, 1998).

Procedure

Before the process began, the students were informed about the research project and signed an informed consent form. Afterward, the students completed the online questionnaire.

Data Analysis

Data processing and analysis were performed using IBM SPSS Statistics version 23. To assess the factorial validity of both scales, an exploratory factor analysis (EFA) with oblimin rotation was applied. This method allows for the identification of potential correlations between factors and verification of item assignment to each component. Prior to this, the suitability of the data for this type of analysis was verified using the Kaiser-Meyer-Olkin (KMO) index, considering values greater than 0.60 as acceptable, and Bartlett's test of sphericity, which required significance levels below 0.05.

To assess the reliability of the scales, Cronbach's alpha coefficient was applied to each factor, and the same alpha was calculated alternating between omissions for each item. This procedure allowed for the identification of items that affect the internal consistency of each factor.

Ethical considerations

This research was conducted in accordance with the ethical standards of the Committee of Institutional research, the 1964 Declaration of Helsinki and its subsequent amendments.

Results

MES and EAD scales questionnaire

To assess sample adequacy, the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity were used. The MES scale obtained a KMO value of 0.611, considered acceptable for conducting a factor analysis, while Bartlett's test of sphericity was statistically significant ($p < 0.05$), indicating sufficient correlations between the variables. These results confirmed the appropriateness of applying an exploratory factor analysis.

The initial analysis yielded a six-component structure, in which all factor loadings

were above 0.30, with 0.382 being the lowest. However, the sixth component consisted of only one variable with an acceptable level of communality (Eq3), which justified repeating the analysis after removing that item. After this modification, the new factor solution showed a five-component structure, with 65.44% of the total variance explained and a slight increase in the extracted communality values, with 0.392 being the lowest recorded value (Table 1).

After removing item Eq3 ("*jobs with little responsibility should have lower salaries"*), exploratory factor analysis, based on the rotated component matrix, revealed a robust factor structure for the MES scale. The resulting version consisted of 14 items grouped into five factors: Budget (4 items), Bad Money (4 items), Equity (2 items), Success (2 items), and Motivator (2 items). This factor configuration supports the instrument's theoretical structure and demonstrates an appropriate grouping of items into their respective factors.

Table 1. MES Matrix

	items	Component						Component				
		1	2	3	4	5	6	1	2	3	4	5
Pre1	"I organize myself very well"	.838						.834				
Pre2	"I handle money very carefully."	.798						.802				
Pre3	"I pay my expenses immediately to avoid paying interest or late fees."	.488						.489				
Pre4	"I make future economic plans"	.691						.691				
Dm1	"Money is an evil"		.382						.392			
Dm2	"Money is at the root of all evil."		.671						.652			
Dm3	"People act unethically to maximize their financial gains."		.657						.700			
Dm4	"Money corrupts people's ethics"		.794						.775			
Eq1	"People who perform the same work should be paid according to their merits."			.710						.720		
Eq2	"People who do the same job should be paid equally."			.829						.817		
Eq3	"Jobs with little responsibility should have lower salaries"						.886					
Ex1	"Money is a symbol of success"				.829						.842	
Ex2	"Money represents personal achievements"				.878						.879	
Mt1	"Money is a motivator"					.826						.809
Mt2	"Money motivates me to work harder"					.790						.775

Fountain: Original work (Pre: Budget, Dm: Bad Money, Eq: Equity, Ex: Success, Mt: Motivator)

Table 1 shows both factor analyses, before and after the modification, the first with a result of 6 components, where the sixth only has one variable, and the second analysis in which said component (and its respective variable) is omitted.

The EAD-6 scale showed a Kaiser-Meyer-Okin (KMO) index of 0.91, indicating excellent sample adequacy for conducting factor analysis. Furthermore, Bartlett's test of sphericity was statistically significant ($p < 0.05$), confirming the existence of sufficient correlations between the variables. These results support the appropriateness of applying an exploratory factor analysis.

The analysis showed favorable results for the scale, revealing a two-component structure that explains 66.57% of the total variance. Furthermore, the extracted communalities showed values greater than 0.673, indicating an adequate distribution of the items within the identified factors (Table 2).

The results of the factor analysis identified two factors in the EAD-6 scale: Social Power (6 items) and Personal Power (6 items). This factor structure coincides with the theoretical proposal and the original configuration of the scale, which supports the consistency of the model in the analyzed sample.

Table 2. EAD-6 Matrix

	items	Component	
		1	2
PF1	"Money helps me feel good"	.845	
PF2	"Money helps me achieve happiness"	.887	
PF3	"If I had more money I would feel completely satisfied"	.880	
PR1	"With money my life would be nicer"	.849	
PR2	"I would like to be rich"	.673	
PR3	"If I were rich, my life would be much better."	.823	
SP1	"Having money allows others to admire you."		.780
SP2	"Money is useful for connecting with others."		.775
SP3	"More money, more friends"		.706
SP4	"Money gives more respect to the one who possesses it"		.840
SP5	"Money allows you to have more influence over others."		.819
SP6	"Money gives a good image to the one who possesses it"		.839

Fountain: Own elaboration (PF: Personal Power Happiness, PR: Personal Power Wealth, SP: Social Power)

The factor analysis proposes eliminating item Eq3 from the MES scale to improve the instrument's configuration by adapting it to 14 items distributed across 5 factors, while approving the structure of 12 items, divided into two factors, for the Attitudes Towards Money Scale (EAD-6).

Reliability analysis of the scales

The reliability of the MES scale was assessed by calculating Cronbach's alpha coefficient, considering the factors that represent different dimensions related to perceptions and attitudes toward money. These factors correspond to Budgeting, Bad Money, Equity, Success, and Motivator, according to the refinement proposed by Luna and Tang (1998) based on the original version of the instrument. The complete questionnaire showed a Cronbach's alpha coefficient of 0.584, reflecting a moderate level of internal consistency in the analyzed sample.

The Budget factor showed a Cronbach's alpha reliability coefficient of 0.689. However, this value increases to 0.703 when the item " *I pay my bills immediately to avoid interest or surcharges* " is removed. Furthermore, this item showed the lowest item-total correlation within the factor, with an r value of .62 (Table 3), suggesting that its removal contributes to improving the internal consistency of the dimension.

In the reliability of the Bad Money factor, the alpha was 0.529, which increases to 0.578 when removing the item " *Money is bad* ", with a correlation of r= .471 with the scale (Table 3).

The Equity factor initially presented a Cronbach's alpha coefficient of 0.372, representing a lower level of reliability among the MES factors (Table 3). However, by omitting item Eq3 (*"Jobs with little responsibility should have lower salaries"*) from the analysis, the factor's reliability increased to 0.542. This result is related to the item-total correlation of the aforementioned item, which was r = .53, suggesting that its inclusion affects the factor's internal consistency.

The Success and Motivator factors, each composed of two items, had Cronbach's alpha coefficients of 0.742 and 0.843, respectively. These values indicate acceptable levels of internal consistency for both dimensions. However, because each factor consists of only two items, it is not possible to perform further modification analyses by removing items (Table 3).

Table 3. Cronbach's alpha of the MES scale

Factor	Items	Cronbach's alpha (α)	α (no suggested item)
Budget	4	0.689	0.703
Bad Money	4	0.529	0.578
Equity	3	0.372	0.542
Success	2	0.742	Not applicable
Motivator	2	0.843	Not applicable

Source: Own elaboration

The EAD Scale consists of two factors, each with six items: the Social Power factor and the Personal Power factor (divided into Wealth and Happiness). The scale's overall reliability test yielded an alpha of 0.918.

The Social Power factor in the reliability test obtained an alpha of 0.883. It was found that, in this case, the composition of 6 items is the most complete, with an average of r=.794 in its correlations with the total of the scale (Table 4).

Happiness had a Cronbach's coefficient of 0.907 and an average item-scale correlation of r= .865. These numbers reflect the Happiness factor as a consolidated element in the evaluations with this instrument on attitudes towards money (Table 4).

The second dimension of the Personal Power factor of the EAD-6 scale, called Wealth, showed a Cronbach's alpha coefficient of 0.820. This value increases slightly to 0.830 when the item *"I would like to be rich" is removed*. Furthermore, the items that make up this dimension showed high correlations with each other, with a measure of r = .789, demonstrating adequate internal consistency. Overall, these results indicate that the Wealth dimension shows good reliability in its measurements, even without modifications to its original structure (Table 4).

Table 4. Cronbach's alpha of the EAD-6 scale

Factor	Items	Cronbach's alpha (α)	α (no suggested item)
Social Power	6	0.883	0.883
Personal Happiness	3	0.907	***
Personal Wealth	3	0.820	0.830

Fountain: Original work***: No suggestion)

Considering the results of the reliability analysis, the MES scale showed an improvement in its internal consistency after the elimination of item Eq3, reaching a Cronbach's alpha coefficient close to 0.60. For its part, the EAD-6 scale showed levels of reliability, presenting a Cronbach's alpha coefficient considerably higher than that obtained in the MES scale.

Discussion

The results obtained allow us to identify certain necessary adjustments to the structure of the MES scale within the analyzed population. In particular, item Eq3 (*"Jobs with little responsibility should have lower salaries"*) showed problematic behavior within the equity factor, generating inconsistencies in the instrument's factor structure. Removing this item improved the internal consistency of this factor, increasing its Cronbach's alpha coefficient from 0.372 to 0.542, which demonstrates greater stability in the measurement of this dimension after the item was refined.

After this adjustment, the resulting factor structure remained consistent with the theoretical organization of the scale into five factors: Budget, Bad Money, Equity, Success, and Motivator. However, despite the observed improvement, the Equity factor continues to show lower reliability levels compared to the other components of the scale, suggesting that this dimension may require future revisions or adaptations when applied to specific contexts.

The results obtained for the Equity factor of the MES scale showed behavior consistent with findings reported in previous research. In a pilot study conducted with a

sample of 50 students, the same item—corresponding to the third item of the factor—also generated inconsistencies in the instrument's structure. In that study, it was observed that removing this item increased the internal consistency of the factor, reaching an alpha coefficient of 0.578, while its correlation with the scale was relatively low (r = .133) (Zamora, Tejeda, & Borroto, 2021). This behavior suggests that the content of the item could be interpreted heterogeneously by the participants, which affects the stability of the Equity factor within different application contexts.

Regarding the Attitudes Toward Money scale (EAD-6), the results of the factor analysis were consistent with the instrument's theoretical structure, composed of two factors, each consisting of six items: Social Power and Personal Power. Furthermore, the reliability analysis demonstrated a high level of internal consistency, with a Cronbach's alpha coefficient of 0.918 for the complete scale, supporting the instrument's stability and reliability in the analyzed sample. The potential improvements resulting from the removal of some items generated only minimal variations in the reliability coefficient and can therefore be considered statistically irrelevant within the factor validity analysis.

It should be noted that the EAD scale has been developed in several versions that vary in the number of items and the number of factors considered. Some studies have reported structures different from the two-dimensional model, such as the work of Denegri et al. (2012), who obtained a factor structure composed of four factors in a study with a Chilean student population. A common limitation when validating instruments is that the results are likely specific to the studied population due to translation issues and language use in different contexts.

In this regard, the results of this research provide empirical evidence on the factorial validity and reliability of the MES and EAD-6 scales among female university students in the Bajío region of Mexico. The validation of these instruments contributes to providing appropriate measurement tools for analyzing perceptions, values, and attitudes related to money within the university setting, facilitating their use in future studies on financial behavior.

Furthermore, measuring attitudinal factors and financial conceptions related to money allows for a broader analysis of financial education beyond technical knowledge. In the Mexican context, where significant challenges in financial education persist, it is crucial to consider these psychosocial dimensions when designing strategies aimed at strengthening financial literacy. As Córdova and Martínez Prats (2021) point out, simply disseminating

financial information is insufficient to modify economic behaviors if the attitudinal factors influencing individuals' actions are not taken into account.

Finally, among the main limitations of the study are the limited theoretical and empirical development surrounding the analyzed instruments, as well as the lack of widespread standardization of their versions. Additionally, the absence of reference norms for interpreting both scales could hinder the comparison of results in longitudinal studies or in studies conducted in different populations. These limitations suggest the need for further research that delves deeper into the validation and adaptation of these instruments in diverse sociocultural contexts.

Conclusions

This research provides empirical evidence on the validity and reliability of two widely used instruments for analyzing perceptions and attitudes toward money: the Money Ethics Scale (MES) and the Money Attitudes Scale (EAD-6), applied to university students in the Bajío region of Mexico. From a theoretical perspective, the study contributes to the literature on financial education by reinforcing the importance of considering not only financial knowledge, but also attitudes, values, and beliefs associated with money—elements that significantly influence individuals' economic decision-making.

Methodologically, the findings confirm the suitability of both scales for application in Mexican university contexts, although they highlight the need for specific adjustments to the MES scale, particularly the Equity factor, whose factor structure showed inconsistencies when item Eq3 was included. Removing this item improved the instrument's internal consistency and maintained its five-factor structure, while the EAD-6 demonstrated a robust factor structure and a high level of reliability. These results underscore the importance of validating psychometric instruments in specific cultural contexts, as their performance can vary depending on the characteristics of the population being analyzed.

From a practical perspective, the study's findings offer useful tools for diagnosing university students' attitudes and perceptions toward money, which can contribute to the design of educational strategies aimed at strengthening financial literacy. In the Mexican context, where challenges related to financial inclusion and behavior among young people persist, identifying attitudinal factors and economic beliefs can facilitate the implementation of educational programs that not only transmit technical knowledge but also promote responsible financial habits, informed decision-making, and economic well-being in daily life.

Future Lines of Research

Finally, future research could broaden the scope of this study by applying these instruments to larger and more diverse samples, as well as through comparative analyses between different regions or sociodemographic groups, in order to deepen the understanding of the psychological and cultural factors that influence individuals' relationship with money.

References

Cárdenas, G., Espinosa, LA, and Li, JJ (2022). Mexico | ENIF 2021: Financial inclusion declines and the gender gap in formal accounts reaches 13.8 percentage points. *BBVA Research.* https://www.bbvaresearch.com/wp-content/uploads/2022/05/2022-05-23-ENIF-2021.pdf

National Banking and Securities Commission [CNBV]. (2024). *National Survey of Financial Inclusion (ENIF) 2024: Results Report.* CNBV. https://www.cnbv.gob.mx/Inclusi%C3%B3n/Anexos%20Inclusin%20Financiera/Reporte_ENIF2024.pdf

National Commission for the Protection and Defense of Financial Services Users [CONDUSEF] (2023). *National Survey on Financial Health (ENSAFI) 2023.* https://www.condusef.gob.mx/?p=contenido&idc=2448&idcat=1

Córdova, EE, & Martínez, G. (2021). Financial education in Mexico: importance and inclusión. *Revista Ciencias de la Documentación, 8* (1), 29-37. Available from: https://www.cienciasdeladocumentacion.cl/index.php/csdoc/article/view/177/179

Denegri, MDC, Alí, Í., Novoa, M., Rodríguez, C., Del Valle, C., González, J., Etchebarne, MS, Miranda, H., & Sepulveda, J. (2012). Relationships between the scales of attitudes towards money and purchasing: A study in pedagogy students from Chile. *Interamerican Journal of Psychology, 46* (2), 229-237.

Engelberg, E., and Sjöberg, L. (2007). Money Obsession, Social Adjustment, and Economic risk Perception. *The Journal of Socio- Economics. 36* (5), 686-697. https://doi.org/10.1016/j.socec.2007.01.005

Furnham, A. (1984). Many sides of the coin: The psychology of money usage. *Personality and Individual Differences, 5* (5), 501-509. https://doi.org/10.1016/0191-8869(84)90025-4

González, VG (2016). *The relationship between women's financial beliefs and their personal development, specifically in self-realization.* [Master's thesis, Universidad Iberoamericana, Centro de Extensión Monterrey].

Huston, S. (2010). *Measuring financial literacy.* Journal of Consumer Affairs, *44* (2) 296-316. https://doi.org/10.1111/j.1745-6606.2010.01170.x

INEGI. (2018). National Survey of Financial Inclusion (ENIF) *2018.* Mexico.

Klontz, B.T., and Britt, S.L. (2012). How Client's Money Scripts Predict Their Financial Behaviors. *Journal of Financial Planning.* 33-43. https://www.financialplanningassociation.org/article/journal/NOV12-how-clients-money-scripts-predict-their-financial-behaviors

Klontz, B., Britt, SL, Archuleta, KL, and Klontz, T. (2012). Disordered Money Behaviors: Development of the Klontz Money Behavior Inventory. *Journal of Financial Therapy, 3* (1) 2. https://doi.org/10.4148/jft.v3i1.1485

López-Lapo, JL, Hernández Ocampo, SE, Peláez Moreno, LE, Sarmiento Castillo, G. del P., Peña Vélez, MJ, Cueva Jiménez, NC, and Sánchez Loor, JP (2022). Financial education in Latin America. Ciencia Latina Multidisciplinary Scientific Journal, *6* (1), 3810-3826. https://doi.org/10.37811/cl_rcm.v6i1.1770.

Luna, R., & Tang, TLP (1998). The economic psychology of money: Analysis of the Money Ethics Scale (MES) and the Money Attitudes Scale (EAD-6). *Journal of Work and Organizational Psychology, 14* (3), 295-313. https://journals.copmadrid.org/jwop/art/f2201f5191c4e92cc5af043eebfd0946

Luna, R., Quintanilla, I. and Díaz. R. (1995). Psychology of money: attitudes and perceptions within young people. IAREP Conference. Institute of Marketing, Bergen, Norway. August 2nd-5th.

Moscovici, S. (1979). (NM Finetti, trans.). *Psychoanalysis, its image and its public.* Buenos Aires, Argentina: Huemul SA (Original published in 1961).

Mungaray, A., González, N., & Osorio, G. (2021). Financial education and its effect on income in Mexico. *Problemas del Desarrollo. Revista Latinoamericana De Economía, 52* (205), 55-78. https://doi.org/10.22201/iiec.20078951e.2021.205.69709

Organization for Economic Co-operation and Development (OECD). (2018). *OECD/INFE toolkit for measuring financial literacy and financial inclusion.* OECD Publishing.

Retrieved from: http://www.oecd.org/daf/fin/financial-education/2018-INFE-FinLit-Measurement-Toolkit.pdf

Rodríguez, L., & Martins, A. (2022). Design and validation of the scale of attitudes towards financial behavior. *Gestionar: Revista de Empresa y Gobierno, 2(3*), 109-123. https://doi.org/10.35622/j.rg.2022.03.008

Tang, L.P.T., & Whiteside, H. (1997). Money attitudes among university faculty: The Money Ethic Scale. Annual Meeting of the Southwestern Psychological Association. Fort Worth, TX.pdf

Zelizer, V. and Vera, H. (2013). Reviews: Viviana Zelizer, The Social Meaning of Money. *Sociological Studies. 31* (extra), 191-197. https://doi.org/10.24201/es.2013v31nextra.84

Wilkis, A. (2015). Moral sociology of money in the popular world. *Sociological Studies (33)* 99 .

Yamauchi, K., & Templer, D. (1982). The Development of a Money Attitude Scale. *Journal of Personality Assessment, 46* (5). *Doi: 10.1207/s15327752jpa4605_14.*

Zamora, MT, Tejeda, AE, & Borroto, Y. (2021). Attitudes toward money: A literature review and pilot study. *ISEOR.* https://www.iseor-formations.com/pdf/ACTESCOLMCD2021/ZAMORA-LOBATO.pdf

Contribution Role	Author(s)
Conceptualization	Judith Banda Guzmán
Methodology	Judith Banda Guzmán
Software	Ángel Flores Ramos
Validation	Judith Banda Guzmán “same” Ángel Flores Ramos “equal”
Formal Analysis	Ángel Flores Ramos
Investigation	Judith Banda Guzmán
Resources	Judith Banda Guzmán
Data curation	Judith Banda Guzmán “same” Ángel Flores Ramos “same”
Writing - Preparing the original draft	Judith Banda Guzmán Ángel Flores Ramos “Supports”
Writing - Reviewing and Editing	Judith Banda Guzmán
Display	Judith Banda Guzmán
Supervision	Judith Banda Guzmán
Project Management	Judith Banda Guzmán
Acquisition of funds	Judith Banda Guzmán