

# INFLUENCE OF BEHAVIORAL FACTORS ON THE PROPENSITY FOR INDEBTEDNESS OF UNIVERSITY STUDENTS

## *INFLUÊNCIA DOS FATORES COMPORTAMENTAIS NA PROPENSÃO AO ENDIVIDAMENTO DOS ESTUDANTES UNIVERSITÁRIOS*

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### ABSTRACT

**Purpose** – The purpose of this paper is to analyze the influence of behavioral factors on the propensity for indebtedness of university students.

**Design/methodology/approach** – The study investigated a random sample of 319 students from a private university in São Paulo. Using the Modeling of Structural Equations, the behavioral factors were measured. For the data analysis, descriptive statistics and median difference tests (Mann-Whitney U test) and independence tests (Chi-square test) were performed.

**Findings** – The findings indicate that: a) the behavior factor presents the strongest effect on the propensity to debt; b) the degree of indebtedness is influenced by sociodemographic variables (gender, race, marital status, occupation and income); c) the levels of risk perception, materialism and propensity for indebtedness are the same for indebted and non-indebted groups; d) the levels of financial behavior and rationality differ between indebted and non-indebted groups.

**Research limitations/implications** – The data collection was carried out in a metropolitan region where the cohort surveyed has specific characteristics that make it difficult to generalize the results.

**Practical implications** – These results may be useful in assisting: a) school leaders in the design of educational programs; b) the financial system in the development of financial strategies and products.

**Social implications** – Educational policy makers can take action to improve the most vulnerable groups.

**Originality/value** – The main theoretical contribution of this work was made by the integrated analysis of four different constructs on the propensity for indebtedness of university students: materialism, rationality, financial behavior and risk perception.

**Keywords** - Materialism, Rationality, Financial Behavior, Risk Perception, Propensity for Indebtedness.



## RESUMO

**Objetivo** – O objetivo deste artigo é analisar a influência de fatores comportamentais na propensão ao endividamento de estudantes universitários.

**Desenho/metodologia/abordagem** – O estudo investigou uma amostra aleatória de 319 alunos de uma universidade privada de São Paulo. Usando a Modelagem de Equações Estruturais, os fatores comportamentais foram medidos. Para a análise dos dados, foram realizadas estatísticas descritivas e testes de diferença de mediana (teste U de Mann-Whitney) e testes de independência (teste de Qui-quadrado).

**Resultados** – Os resultados indicam que: a) o fator comportamento apresenta o maior efeito sobre a propensão ao endividamento; b) o grau de endividamento é influenciado por variáveis sociodemográficas (sexo, raça, estado civil, ocupação e renda); c) os níveis de percepção de risco, materialismo e propensão ao endividamento são os mesmos para os grupos endividados e não endividados; d) os níveis de comportamento e racionalidade financeira diferem entre grupos endividados e não endividados.

**Limitações/implicações da pesquisa** – A coleta de dados foi realizada em uma região metropolitana onde a população pesquisada apresenta características específicas que dificultam a generalização dos resultados.

**Implicações práticas** – Esses resultados podem ser úteis para auxiliar: a) líderes escolares no desenho de programas educacionais; b) o sistema financeiro no desenvolvimento de estratégias e produtos financeiros.

**Implicações sociais** – Os formuladores de políticas educacionais podem tomar medidas para melhorar os grupos mais vulneráveis.

**Originalidade/valor** – A principal contribuição teórica deste trabalho deu-se pela análise integrada de quatro diferentes construtos sobre a propensão ao endividamento de estudantes universitários: materialismo, racionalidade, comportamento financeiro e percepção de risco.

**Palavras-chave** – Materialismo, Racionalidade, Comportamento Financeiro, Percepção de Risco, Propensão para Endividamento.

## 1 INTRODUCTION

With the creation of the “*Plano Real*” to curb rising inflation, Brazilians enjoyed relative stability in the economy and significant social mobility which – together with the increase in employment, improvement of the population’s monthly income, and easier access to credit from financing agencies – helped people strengthen their desire to consume goods and services they had never before been able to. (Santos & Souza, 2014). In this context of the facilities offered in the credit system, with low interest rates and long-term repayment, several side effects arose, including the growth of household indebtedness and increase in loan defaults. (Fernandes & Cândido, 2014).

According to information from the Consumer Debt and Default Survey [PEIC] (2019), in April 2019, 62.7% of Brazilian families were in debt, 23.9% had overdue bills, and 9.5% were unable to repay past due debts. The main type of debt was credit card debt (77,6%). According to a report from the National Confederation of Shopkeepers [CNDL] (2018), in August 2018, 59.4% of the defaulters had a high school diploma or were high school dropouts, and 28.9% of the defaulters were between 25 and 34 years of age; 16% of the financial commitments that led to the indebtedness were those arising from school or college; and the difficulties in settling overdue debts arose from insufficient income (35.6%) and unemployment (26.6%).

People find it difficult to repay their debts and, in general, have little capacity to manage their resources. (Zerrenner, 2007). The difficulty in managing the available resources, coupled with exaggerated optimism, leads to excessive consumption that generates increased indebtedness. This can lead to default as a result of income instability, generating a vicious circle of taking out new loans to pay off old ones. (Santos & Souza, 2014). These difficulties can affect their lives and their social relationships, leading to incidents such as marital separation and unemployment, as well as physical and mental health issues. (Yamauchi & Templer, 1982).

Young people also have problems with debt. Teenagers are often cited as vulnerable con-



sumers, given their psychological and cognitive condition. In this case, there is double situation of vulnerability. The first one stems from the moment of biological and cognitive transformation that characterizes adolescence; the second one is the high propensity for compulsive buying. The state of vulnerability, coupled with the experience of a materialistic culture, where possessions are indicators of success and a strategy for self-realization, lead to exaggerated consumption, which becomes the central goal of their lives, also leading to problems of a psychological and financial nature. (Medeiros, Diniz, Costa, & Pereira, 2015).

According to Roberts and Roberts (2012), adolescents increasingly resort to compulsive shopping in an attempt to deal with high levels of academic stress. Although the psychological benefit of the behavior of excessive and uncontrolled purchasing of goods is sometimes positive, it can lead to serious adverse effects on their personal, social, occupational or financial lives. (Dittmar, 2005). Despite the fact that parents and teachers are unable to prevent stress in young people during this stage of life, there is a need for actions aimed at changing values within society, emphasizing the possibility of happiness beyond the desire for and possession of goods. (Medeiros et al., 2015).

According to Livingstone and Lunt (1992), there are several factors that have been analyzed in academic papers to explain the individual's relationship with debt. Research was found on the reasons for indebtedness (Katona, 1975); the relationship between the propensity for indebtedness and sociodemographic variables (Livingstone & Lunt, 1992); the relationship between indebtedness and materialism (Watson, 2003; Flores, 2012, 2013; Santos & Souza, 2014); the relationship between financial debts and excessive consumption (Wu, 2006; Santos & Souza, 2014); and the relationship between risk perception, financial behavior, emotions and the value of money, and one's propensity for indebtedness (Flores, 2012, 2013).

In a bibliometric study carried out in journals, research was found on the indebtedness among university students. Boddington and Kemp (1999) conclude that the percentage of students in debt, the level of debt, and the degree of tolerance towards debt increases with the level of study. Norvilitis and Santa Maria (2002) report that credit card debt is a growing problem on college campuses; the causes include belief in future earnings and lack of financial knowledge. A study by Nellie Mae (2005) documents that high levels of students' debts are associated with funding their studies. Lucci, Zerrenner, Verrone, and Santos (2006) conclude that the knowledge of financial concepts learned at the university positively influences the quality of financial decision-making. Mendes-da-Silva, Nakamura, and Moraes (2012) conclude that, as the number of credit cards increases, the likelihood of risky behavior rises. Avdzejus, Santos, and Santanta (2012) assert that the reasons for indebtedness are lack of planning and unbridled consumerism; young people use credit seeing only the advantages, failing to assess that misuse of credit can lead to unnecessary debt. Santos and Souza (2014) report that, although there is expressive consumption among university students, the situation of financial debt is explained by their materialistic attitudes. Vieira, Ceretta, Melz, and Gastardelo (2014) conclude that culture and worry have a positive impact on one's propensity for indebtedness. Minella, Bertosso, Pauli, and Corte (2017) confirm that financial education helps young people not to compromise future income with purchases that will take a long time to pay off.

This information is relevant, as it indicates that young people do not identify their level of debt as a problem, leading many of them to take on debts, if the offer of credit so allows. (Minella et al., 2017).

In view of this scenario, the following research question arises: What is the influence between behavioral factors – materialism, risk perception, rationality and financial behavior – on the propensity for indebtedness among university students?

This study is justified by addressing a current topic, which constitutes an interest for discussion in three segments of the economy: government, the financial sector, and schools. It is an



important aspect for the government, which wants to keep the economy growing; for companies in the financial sector, who wish to grant credit and plan their operational/financial cycle more appropriately; and for school managers, who want to prepare their students for financial and professional adulthood.

This article is organized in six sections, including this introduction. The second section presents the theoretical framework that supports the research. The third section details the methodology used. The fourth section presents the structural model. The fifth section discusses the empirical results, and the last section concludes with final considerations.

## 2 THEORETICAL REFERENCE

This work is based on the factors of materialism, rationality, risk perception and financial behavior to assess the propensity for indebtedness among university students. According to Moura, Aranha, and Zambaldi (2006), debt can be defined as all the liabilities that an individual has at any given time. Indebtedness can be analyzed from three aspects. The “moral dimension” aspect encompasses the values, beliefs and heritages that are present in society and that exert an influence on people’s attitude towards their indebtedness, whether through the social acceptance of debt or through economic socialization. The “Preference over time” aspect represents the choice between buying in the present by borrowing money or gaining a premium for waiting and paying cash in the future. The “degree of self-control” aspect involves one’s ability to manage financial resources and make financial decisions. (Moura, 2005).

In recent years, studies have been conducted in academia that assess indebtedness, since several factors can encourage acquiring goods and services and assuming credit. Zuckerman and Kuhlman (2000) conclude that younger men have higher levels of impulsivity, tending to risk more and acquire a higher level of debt. Ponchio (2006) concludes that women are more favorable to the attitude of indebtedness than men. Katona (1975) and Zerrenner (2007) conclude that one of the main reasons for an individual to get into debt is the fact that he or she has low income. Frade, Lopes, Jesus, and Ferreira (2008) concludes that single people, after going through a situation of over-indebtedness, are more cautious when asked if they would assume high levels of credit again. Nogueira (2009) believes that married people can have a high level of risk perception and avoid taking on debt, while single people often exhibit a greater tendency toward risk due to the security that one’s family offers. Gathergood (2012) concludes that over-indebtedness is more common in younger families and with lower education, causing a higher default rate.

In addition to sociodemographic aspects, the literature indicates a relationship between the propensity for indebtedness and materialism. According to Richins and Dawson (1992), materialism involves values that guide consumer choices, influencing the decision of the type and quantity of product to be purchased. According to Rokeach (1973), a consumer’s values are the principles that guide actions, attitudes, judgments and comparisons between goods and situations, and between present and future goals. Therefore, the differences between consumers are more associated with the way they organize and prioritize their values.

Analyzing theoretical studies and conducting qualitative research that reflected common sense, Richins and Dawson (1992) identified three dimensions of materialism. The “centrality” dimension measures possession or acquisition as being central in a materialist’s life. The “happiness” dimension measures the hope that possession or acquisition will bring happiness and well-being. And the “success” dimension measures how much a person judges oneself and other people according to the quantity and quality of the goods one owns.



Materialism plays a major role in the consumer's level of indebtedness in an economy where it is no longer necessary to have money at the time of purchase, since the availability of credit enables consumers to buy now and pay later. (Watson, 2003). This effect of materialism on the consumer's level of indebtedness can be intensified by the cognitive dissonance in consumers, since they do not feel the weight of cash payment; in other words, credit card users can be led to consume more when compared to users who prefer to pay cash. One of the factors that may explain this behavior is the fact that credit card users tend to evaluate only if the amount of the installment payment fits in their budget, not being aware of the cost of credit by the end of the period. (Block-Lieb & Janger, 2006).

This economic trend has significant implications for materialism, since – with the aim of satisfying acquisition desires – a person with a high level of materialism may be willing to assume debts. (Richins & Rudmin, 1994). Therefore, a person with a high level of materialism is more likely to have a positive attitude towards taking on debt than a person with a low level of materialism. (Watson, 2003; Moura, 2005; Ponchio, 2006).

The literature also presents a relationship between rationality and the propensity for indebtedness. The theories that make up Modern Finance are based on Neoclassical Economic Theory, whereby individuals make decisions based on unlimited rationality, always seeking to maximize their utility function. (Mullainathan & Thaler, 2000). Utilitarian purchase values occur when the purchase is completed in a rational, efficient and objective manner, whereby the utilitarian value of the purchase is based on the utility or usefulness it has for the consumer, verifying whether the product or service purchased actually meets their needs, always with the lowest monetary outlay. (Batra & Ahtola, 1991). The “utilitarian consumption” dimension, therefore, guides the consumer to seek the achievement of goals with the lowest risk, being an attitude contrary to indebtedness. (Livingstone & Lunt, 1992).

The way in which a person behaves also has a significant impact on one's personal finances. It is important to capture evidence of financial behavior, such as paying bills, setting a budget, money-saving habits, and obtaining credit. (Atkinson & Messy, 2012). Several authors have studied the relationship between financial behavior, indebtedness, and sociodemographic variables. Varcoe and Wright (1991), Shelton and Hill (1995), and Hogarth and Swanson (1995) indicate that increased knowledge improves behavior in relation to personal finances. Chen and Volpe (1998) conclude that the education system does not prepare US students for the financial market, increasing the likelihood of taking on excessive debt. Disney and Gathergood (2011) conclude that less financially literate families tend to assume a higher level of indebtedness.

An individual's decision whether or not to take out credit can also be influenced by the risk perception that this individual has regarding the likelihood of not meeting their financial obligations, and on the advantages and disadvantages associated with the pleasure of immediate consumption and the restriction of future income. (Frade et al., 2008).

Furthermore, one must consider the bias that the individual has regarding one's ability to determine the likelihood of an event. By underestimating the likelihood of a negative event that interrupts one's future income, this individual can take on a higher credit level than a rational consumer would. (Block-Lieb & Janger, 2006). This bias can also favor a situation of assuming multiple debts, increasing one's exposure to the risk of default. (Frade et al., 2008).

Studies have been conducted aimed at analyzing the relationship between risk perception, indebtedness, and sociodemographic variables. Zuckerman and Kuhlman (2000) show that younger men have higher levels of impulsivity due to testosterone levels, tending more toward risk and, consequently, toward higher indebtedness. Caetano, Patrinos, and Palacios (2011) say students who



have greater aversion to risk are less likely to take out loans. Caetano et al. (2011) and Flores (2012) conclude that individuals with a higher risk perception tend to have lower levels of indebtedness, as aversion prevents unplanned spending. Flores (2012) concludes that older people (over 30 years of age) have a higher risk perception.

Given this scenario, the study established the following hypotheses: H1: The higher the level of appropriate financial behavior, the lower the propensity for indebtedness; H2: The higher the level of materialism, the greater the propensity for indebtedness; H3: The higher the level of rationality, the lower the propensity for indebtedness; H4: The higher the level of risk perception, the lower the propensity for indebtedness.

### 3 METHODOLOGY

The present study has a quantitative nature, with cross-section, through application of a survey. The empirical-analytical approach was the main one used in this study. The population (2,498) is the total number of students enrolled in the second semester of 2016, from the 1st to the 6th stages, in the Applied Social Sciences programs at a private university in the city of São Paulo, Brazil. In 2016, the “General Index of Courses” (IGC) – the Brazilian government’s college and university ranking system – for this university was 4 (on a scale of 1 to 5); the “Course Concept” (CC) – the ranking system for undergraduate programs at Brazilian colleges and universities – for the Business Administration and Accounting Sciences programs was 4, and for the Economic Sciences program, 3 according to the Ministry of Education [MEC] (2019). This population group was chosen because it characterizes economically active consumers, given the facilities of financial agencies, with less commitment, less maturity, and lower income. (Santos & Souza, 2014). The research was conducted from a non-probabilistic approach, for the sake of convenience. Data were collected in the classroom, personally, according to the professor’s availability. Students were not required to respond and were not identified, thus maintaining the confidentiality of the data. In all, 319 valid questionnaires (12.8% of the population) were collected. The technique used for data collection was a closed-ended questionnaire.

In order to verify whether the proportion of monthly income earmarked for repaying debt is related to sociodemographic variables, the Chi-square test was performed. The null hypothesis indicates that the variables are independent; the alternative hypothesis indicates that the variables are dependent. To use the Chi-square test, it was found that there was a maximum of 25% of cells with an expected frequency below 5. The tests are performed at a 95% confidence level.

To measure the factors, the questions were organized on a five-point Likert scale, where 1 means “strongly disagree” and 5 means “strongly agree”. The *indebtedness* factor uses a measure proposed by Moura (2005), which assesses the propensity for indebtedness in relation to three aspects: *moral impact*, *preference over time* and *degree of self-control*. The *financial behavior* factor uses a measure proposed by Matta (2007), which assesses behavior in relation to four aspects: *financial management*, *use of credit*, *investment and savings*, and *planned consumption*. The *materialism* factor uses a measure proposed by Richins (2004), which assesses materialism in relation to three aspects: *centrality*, *happiness*, and **success**. The *rationality* factor uses a measure proposed by Nepomuceno and Torres (2005) to assess the individual’s degree of rationality. The *risk perception* factor uses a measure proposed by Flores (2012) to assess the individual’s risk perception. The questions used in the initial factor measurement model are available in Table 1. After adjusting the measurement model, the questions marked with an asterisk were removed.



To measure the factors, Structural Equation Modeling is used with SmartPLS software, version 2.0 M3. The program uses the Partial Least Squares (PLS–SEM) method and makes it possible to simultaneously examine multiple dependence and independence relationships between factors, through observed variables. The aim is to maximize the variance explained in the dependent factors and to evaluate the quality of the data based on the characteristics of the measurement model. (Nascimento & Macedo, 2016).

**Table 1** – Descriptive statistics of the initial component variables of the factors

Factors		Variables	Mean	Median	Standard deviation
Net	Moral impact	20.1 - It is right to spend more than I make.	1.39	1.00	0.82
		20.2 - I think it is normal for people to go into debt to pay for their things.	2.36	2.00	1.10
		20.3 - People would be disappointed in me if they knew that I am in debt. *	2.67	3.00	1.15
	Preference over Time	20.4 - It is better to buy something on credit than to save up the money first.	2.09	2.00	1.02
		20.5 - I prefer to purchase in installments rather than to wait until I have enough money to pay in cash. *	2.51	2.00	1.10
		20.6 - I prefer to pay in installments even if the total amount ends up being more expensive.	1.94	2.00	1.00
	Degree of Self-Control	20.7 - I do not know exactly how much I owe on store cards, credit cards or bank loans.	1.85	1.00	1.08
		20.8 - It is not important to know how to control the expenses of my household.	1.30	1.00	0.63
		20.9 - It is okay to be in debt if I know I can pay. *	3.38	4.00	1.26
Financial Behavior	Financial management	21.1 - I am concerned with managing my money better.	3.75	4.00	0.68
		21.2 - I record and control my personal expenses.	2.83	3.00	1.08
		21.3 - I set financial goals that influence how I manage my finances.	3.02	3.00	1.08
		21.4 - I follow a weekly or monthly budget or spending plan.	2.71	3.00	1.11
		21.5 - I never go more than a month without taking stock of my expenses.*	2.76	3.00	1.15
		21.6 - I am satisfied with the system I use for controlling my finances. *	2.95	3.00	1.10
		21.7 - I pay my bills on time. *	3.78	4.00	0.91
	Use of credit	21.8 - I know how to identify the costs I will pay when buying a product on credit. *	3.39	4.00	1.18
		21.9 - I have not used automatic bank credit cards because I have money available.	3.58	4.00	1.13
		21.10 - When buying on installments, I compare the credit options that are available. *	3.12	3.00	1.42
		21.11 - Less than 10% of the income I will earn the following month is committed to purchases on credit.	3.10	3.00	1.51
		21.12 - I pay my credit card bill(s) in full to avoid financial charges.	4.04	4.00	0.95
		21.13 - I check my credit card bill for any errors or undue charges. *	3.83	4.00	1.09
	Investment and savings	21.14 - I set money aside monthly.	3.18	3.00	1.04
		21.15 - I set money aside to buy a more expensive product. Example: car, apartment.	3.11	3.00	1.21
		21.16 - I have a financial reserve that is greater than or equal to three times my monthly income.	3.15	3.00	1.51
	Planned consumption	21.17 - I compare prices when making a purchase.	3.65	4.00	0.84
		21.18 - I analyze my finances in depth before making any major purchases.	3.49	4.00	0.90
21.19 - I do not buy on impulse.		2.82	3.00	0.98	
21.20 - I prefer to save up money to buy something in cash rather than buying a financed product. *		3.10	3.00	1.01	
21.21 - My friends and family advise me on financial matters. *		2.63	3.00	1.07	



Factors		Variables	Mean	Median	Standard deviation
Materialism	Centrality	22.1 - I like to spend money on expensive things.	2.87	3.00	1.12
		22.2 - Buying things gives me great pleasure.	3.37	4.00	1.12
		22.3 - I like a lot of luxury in my life.	2.73	3.00	1.14
	Happiness	22.4 - My life would be much better if I had a lot of the things I do not have now.	2.99	3.00	1.14
		22.5 - I would be much happier if I could buy more things.	3.42	4.00	1.15
		22.6 - I feel uncomfortable when I cannot buy everything I want.	3.21	3.00	1.15
	Success	22.7 - I admire people who own houses, cars and expensive clothes.	2.74	3.00	1.17
		22.8 - I like to have things that impress people.	2.29	2.00	1.15
		22.9 - Spending a lot of money is among the most important things in life.	1.73	1.00	0.92
Rationality	23.1 - I believe in being logical and rational when deciding on a product.	3.88	4.00	0.92	
	23.2 - Before I make a final decision about a product, I consider the pros and cons about each product.	3.87	4.00	0.92	
	23.3 - Before making a final decision about a product, I look for a lot of information about each product.	3.79	4.00	0.95	
	23.4 - Before making a final decision about a product, I think a lot about myself using the product.	4.01	4.00	0.84	
	23.5 - I believe in exercising self-control and not being impulsive when deciding on a product.	3.76	4.00	0.91	
	23.6 - I believe in making a responsible, well thought-out decision.	3.80	4.00	0.85	
	23.7 - I believe in selecting a product based on a careful examination of all its features. *	3.71	4.00	0.91	
	23.8 - I think it is important to select the most practical product.*	3.46	4.00	0.89	
	23.9 - When I am deciding whether or not to buy a product, I think about its usefulness.	4.07	4.00	0.83	
Risk perception	24.1 - Spending a lot of money on lotteries.	3.98	4.00	1.22	
	24.2 - Being someone's guarantor or co-signer.	3.87	4.00	1.08	
	24.3 - Spending money impulsively, without thinking about the consequences.	4.41	5.00	0.89	
	24.4 - Investing in a business that has a high chance of failing.	4.13	4.00	1.06	
	24.5 - Lending most of your monthly salary or income to a friend or family member.	3.83	4.00	1.14	

(\*) Removed in the final model. Source: Research data

According to Hoyle (1995), a sample with at least 200 observations is required to calculate the factors. The process for evaluating the quality of the results is divided into two stages: evaluation of the measurement model and evaluation of the structural model.

To evaluate the measurement model, the following are analyzed: composite reliability, convergent validity, and discriminant validity. Composite reliability is used to check for high levels of internal consistency in the factors. (Ringle, Silva, & Bido, 2014). According to Hair, Hult, and Ringle (2016), satisfactory values are between 0.7 and 0.9.

Convergent validity is obtained by observing each factor's average variance extracted (AVE), and is aimed at verifying the part of the data that is explained by the factor, or how positively the variables correlate with the factor, on average. (Ringle et al., 2014). Using the Fornell–Larcker (1981) criterion, AVE values greater than 0.5 admit that the model converges to a satisfactory result.

Discriminant validity is an indicator that evaluates whether the factors are independent of one another. (Ringle et al., 2014). For this, the Fornell–Larcker (1981) criterion is used, whereby the square roots of the AVE values must be greater than the correlations.

After this adjustment phase, the structural model is analyzed. To assess the structural model, Pearson's determination coefficients, the significance of the correlations between the factor and



its respective indicators, the predictive validity, and the size of the effect are analyzed. (Ringle et al., 2014; Nascimento & Macedo, 2016).

First, we analyzed Pearson's coefficient of determination ( $R^2$ ), which seeks to assess the portion of variance of the endogenous factor that is explained by the structural model. (Ringle et al., 2014). Coefficient values must be greater than  $|0.1|$ . According to Cohen (1988), for the area of Social and Behavioral Sciences, when the  $R^2$  is equal to 2%, the model is classified as having a minor effect; if  $R^2$  is equal to 13%, the effect is medium, and when  $R^2$  is equal to 26%, the effect is major. Next, it is assessed whether the relationships between the factor and its respective indicators are significant, since the model works with correlations. Using the resampling technique, the software calculates Student's T-tests between the original values of the data and those obtained by the resampling technique, for each correlation relationship. The null hypothesis indicates that the correlation is not statistically significant ( $p = 0$ ) and the alternative hypothesis indicates that the correlation is statistically significant ( $p \neq 0$ ). A value above 1.96 indicates that the correlation is significant at a 95% confidence level.

To examine the predictive capacity of the model and the relationships between the factors, it is important to examine the existence of collinearity problems in the structural model. To perform this assessment, the Variance Inflation Factor (VIF) is used. According to Favero, Belfiore, Silva, and Chan (2009), VIF values above 5 can already lead to collinearity problems. For this calculation, SPSS software version 24 is used.

Predictive validity is the model's ability to predict ( $Q^2$  – Stone-Geisser). PLS-SEM seeks to obtain parameter estimates by maximizing the explained variance of the endogenous factor. Therefore, the structural model is evaluated based on heuristic criteria, determined by the model's predictive capacity. (Hair et al., 2016). According to Hair et al. (2016), values greater than zero for  $Q^2$  indicate that the model demonstrates relevance.

The effect size ( $f^2$ ) is an indicator that seeks to report the effect size that the factors have in assessing whether the omitted factor has a substantial impact on the endogenous factor of interest. (Nascimento & Macedo, 2016). According to Hair et al. (2016), a value of 0.02 indicates a minor effect; a value of 0.15 indicates a medium effect, and a value of 0.35 indicates a major effect. Once the evaluation of the quality of the model's adjustment is completed, the coefficients are interpreted.

To verify whether the factors are influenced by sociodemographic variables, the Mann-Whitney  $U$  non-parametric test was performed, which compares the medians of two independent samples. The null hypothesis indicates that the medians are equal, and the alternative hypothesis indicates that the medians are different. The tests are performed at a 95% confidence level. The Kolmogorov-Smirnov test was used to verify the normality of the data, and the Levene test based on the mean was used to verify whether there is homogeneity of the variances.

## 4 ANALYSIS AND DISCUSSION OF THE RESULTS

This section is divided into three parts: First, the general aspects of the sample are presented; then, the measurement model and the structural model are evaluated; lastly, statistical tests are conducted to verify the relationship between the propensity for indebtedness, sociodemographic factors and variables.

### 4.1 General aspects of the sample

Out of the total of 319 university students in the sample, 159 (50%) are in debt. Out of the



159 indebted individuals, 85 (53%) commit more than 30% of their income; 35 (22%) have debts in arrears; 126 (79%) use credit cards; 47 (30%) use debit card/overdraft protection; and 69 (43%) use more than one source of credit (those with multiple outstanding debts). Santos and Souza (2014) report that 49% of the 415 university students residing in Santa Catarina have debts, and 36% show preference for credit cards.

In the sample of students from São Paulo, women (63%) have greater propensity for indebtedness (Table 2). The Chi-square test ( $p$ -value = 0.003) indicates an association between the proportion of committed income and gender (Cramér's  $V$  = 21.1%). A similar conclusion was reached in Ponchio's research (2006).

The group of Black/Brown people (66%) is more prone to indebtedness (Table 2). The Chi-square test ( $p$ -value = 0.004) indicates an association between the proportion of committed income and race (Cramér's  $V$  = 20.4%). This confirms the conclusion by Grable and Joo (2006) and Potrich, Vieira, and Ceretta (2013) that White people have better levels of financial responsibility when compared to Black people.

The group with a stable relationship (71%) has greater propensity for indebtedness (Table 2). The Chi-square test ( $p$ -value = 0.003) indicates an association between the proportion of committed income and marital status (Cramér's  $V$  = 20.8%). A similar result was obtained by Keese (2010), which states that heads of households are more prone to higher finance charges.

The group with steady monthly income (63%) is more prone to indebtedness (Table 2). The Chi-square test ( $p$ -value = 0.000) indicates an association between the proportion of committed income and monthly income (Cramér's  $V$  = 44.5%). The result is in line with that of Flores (2012), which states that individuals who have regular income tend to take risks due to the perception of financial security, since income can offset their mistakes.

The group over 30 years of age (61%) is more prone to indebtedness (Table 2); however, the Chi-square test ( $p$ -value = 0.805) does not indicate a statistically significant association between the proportion of committed income and age (Cramér's  $V$  = 5.6%), not confirming the result obtained in the research by Ponchio (2006), where younger people tend to have higher levels of indebtedness.

The working group (60%) is more prone to indebtedness (Table 2). The Chi-square test ( $p$ -value = 0.000) indicates an association between the proportion of committed income and occupation (Cramér's  $V$  = 39.8%). This result was also obtained by Keese (2010), according to which unemployed individuals have higher levels of risk perception in the face of pessimistic expectations for the future, being more cautious when it comes to taking on debt.

When the student is asked about the reason for the indebtedness (Table 3), one can see that the mismanagement of money (21.6%), easy access to credit (21.0%) and the compulsive purchasing (16, 6%) were the most commonly marked, showing a low level of rationality. In the group with a high level of rationality, the most widely cited was the investment in a higher education program (13.2%). It is worth noting that, out of the 159 students in debt, 92 (57.9%) indicated more than one reason for their indebtedness.

By this analysis, one can conclude that 50% of the sample is in debt. Out of those in debt, 54% commit more than 30% of their income, and 22% have debts in arrears. The main sources of financing (63%) are credit cards and the debit card/overdraft protection. The main reasons for indebtedness are compulsory purchasing, money mismanagement, and easy access to credit. The proportion of monthly income to repay debt changes according to gender, marital status, monthly income, race, and occupation.



**Table 2** – Proportion of income commitment and Chi-square test

Sociodemographic variables		Proportion of committed income				Total	Chi-square test		
		Has no debt	Up to 15%	16–30%	>30%		p-value	Conclusion	Cramér's V
Gender	Female	46 37%	16 13%	22 18%	40 32%	124 100%	0.003	Influence	0.211
	Male	114 58%	15 8%	21 11%	45 23%	195 100%			
Race	White and Asian	138 54%	24 9%	36 14%	57 22%	255 100%	0.004	Influence	0.204
	Black and Brown	22 34%	7 11%	7 11%	28 44%	64 100%			
Marital status	Single	149 53%	29 10%	37 13%	66 24%	281 100%	0.003	Influence	0.208
	Stable Relationship	11 29%	2 5%	6 16%	19 50%	38 100%			
Income	No monthly income	74 87%	3 4%	3 4%	5 6%	85 100%	0.000	Influence	0.445
	Has monthly income	86 37%	28 12%	40 17%	80 34%	234 100%			
Age	Up to 30 years	153 51%	29 10%	40 13%	79 26%	301 100%	0.805	does not influence	0.056
	>30 years	7 39%	2 11%	3 17%	6 33%	18 100%			
Occupation	I do not work	58 87%	5 7%	1 1%	3 4%	67 100%	0.000	Influence	0.398
	Work	102 40%	26 10%	42 17%	82 33%	252 100%			
Total		160 50%	31 10%	43 13%	85 27%	319 100%			

Source: Research data

**Table 3** – Reason for indebtedness according to the level of rationality

Rationality Level	Reason for indebtedness	Quantity	% Total (319)
Low	Compulsive buying	53	16.6%
	Mismanagement of money	69	21.6%
	Easy access to credit	67	21.0%
	No discount for cash payment	15	4.7%
	Lending one's name, being a guarantor, being a co-signer	21	6.6%
High	Did not get into debt	160	50.2%
	Acquisition of own home	12	3.8%
	Investment in a higher education program	42	13.2%
	Unemployment or reduced income	21	6.6%
	Health problems	3	0.9%

Source: Research data



## 4.2 Model and factors

To calculate the factors using Structural Equation Modeling, a sample with at least 200 observations is required. This work uses 319 observations, having a sufficient quantity for the development of the study. To obtain the results satisfactorily, the following variables were removed from the model (Table 1): Q20.3 (moral impact), Q20.5 (preference over time), Q20.9 (degree of self-control), Q21.5, Q21.6, Q21.7 (financial management), Q21.8, Q21.10, Q21.13 (use of credit), Q21.20, Q21.21 (planned consumption), Q23.7 and Q23.8 (rationality).

The first step in the process of evaluating the quality of the results is to analyze the measurement model, whereby composite reliability, convergent validity, and discriminant validity are verified. Analyzing the data in Table 4, all values of composite reliability are higher than the acceptable minimum of 0.7, leading to the conclusion that there are reliable indicators.

Analyzing the values of Average Variance Extracted (Table 4), it is observed that the AVEs are all greater than 0.5, leading to the conclusion that there is convergent validity. Analyzing the data in Table 5, one can see that all the quadratic values of the AVEs of all factors are higher than the values of the correlations, leading to the conclusion that there is discriminant validity.

**Table 4** – Average variance extracted (AVE) and composite reliability of the factors

Factors	Average Variances Extracted (AVEs)	Composite Reliability
Centrality	0.6668	0.8570
Happiness	0.7224	0.8863
Success	0.6741	0.8606
Planned consumption	0.5259	0.7604
Use of credit	0.5694	0.7983
Financial management	0.5641	0.8380
Investment and savings	0.6273	0.8343
Degree of self-control	0.5796	0.7112
Moral impact	0.5820	0.7196
Preference over Time	0.5525	0.7069
Financial Behavior	0.5381	0.8175
Net	0.6631	0.8421
Materialism	0.7141	0.8822
Rationality	0.5414	0.8909
Risk Perception	0.5734	0.8703

Source: Research data

**Table 5** – Correlation and square root of the AVEs

Factors	Correlation	Square root of the AVE
Centrality - Happiness	0.5621	0.8166
Centrality - Success	0.6002	
Happiness - Success	0.5658	0.8499
Planned consumption - Use of credit	0.3522	0.7252
Planned consumption - Financial management	0.5189	
Planned consumption - Investment and savings	0.4451	

Factors	Correlation	Square root of the AVE
Use of credit - Financial management	0.2336	0.7546
Use of credit - Investment and savings	0.3797	
Financial management - Investment and savings	0.4890	0.7511
Financial Behavior - Indebtedness	-0.4121	0.7336
Financial behavior - Materialism	-0.1057	
Financial behavior - Rationality	0.5190	
Financial behavior - Risk perception	0.1190	
Indebtedness - Materialism	0.2051	0.8143
Indebtedness - Rationality	-0.3076	
Indebtedness - Risk perception	-0.1843	
Materialism - Rationality	-0.0299	0.8450
Materialism - Risk perception	0.0562	
Rationality - Risk perception	0.2553	0.7358
Degree of self-control - Moral impact	0.2279	0.7613
Degree of self-control - Preference over time	0.7540	
Moral impact - Preference over time	0.2112	0.7629

Source: Research data

After the measurement model has been evaluated, the next step is to evaluate the final structural model. Evaluating the degree of explanation of the variance of the indebtedness factor,  $R^2$  was 0.225, which allows us to conclude that the four factors tested (materialism, financial behavior, risk perception, and rationality) explain 22.5% of the indebtedness factor variance. According to Cohen (1988), this effect is classified as major.

After the estimation process, the values of Student's T-statistic are reported to test the model's significance in path modeling (Table 6). As all Student's T-statistics are greater than 1.96, the conclusion is that the model loads are highly significant, at a 95% confidence level. In other words, the correlations and regressions are highly significant in the proposed model.

The next step in evaluating the structural model is to examine the model's predictive capability and the relationships between factors. To this end, there is a need to verify the existence of collinearity problems in the structural model. Analyzing the VIF values of the factors (financial behavior = 1.397; materialism = 1.016; rationality = 1.460; risk perception = 1.074), no collinearity problems were noted, since the VIF values are all below 5.

Aside from evaluating the magnitude of the  $R^2$  values as a criterion for predictive accuracy, it is also necessary to examine the Stone-Geisser  $Q^2$  values. All  $Q^2$  values (excluding materialism = 0.1466; excluding financial behavior = 0.1466; excluding risk perception = 0.1447; excluding rationality = 0.1421) are considerably higher than zero, leading to the conclusion that the model possesses predictive relevance.

To assess how useful each factor is for adjusting the model, the effect size ( $f^2$ ) is used. All  $f^2$  values (excluding materialism = 0.039; excluding financial behavior = 0.098; excluding risk perception = 0.021; excluding rationality = 0.011) are close to 0.02 indicating a small effect.

Once the evaluation of the quality of the model's adjustment is completed, the coefficients are interpreted. Note that the model suggests that the financial behavior factor has a stronger interior effect on the indebtedness factor (-0.326), followed by materialism (0.175), risk perception



(-0.130) and rationality (-0.101); the predicted relationship between all factors is statistically significant, since the standardized coefficients are greater than |0.1|.

**Table 6** – Values of Student’s T-statistic of factors and variables

Factors and variables	Student’s T	Factors and variables	Student’s T
Q21.1 <- Financial management	18.6410	Q20.6 <- Preference over time	4.0558
Q21.11 <- Use of credit	13.6521	Q20.7 <- Degree of self-control	96.0323
Q21.12 <- Use of credit	12.1656	Q20.8 <- Degree of self-control	5.0249
Q21.14 <- Investment and savings	35.6187	Moral <- Indebtedness	4.2304
Q21.15 <- Investment and savings	21.6221	Time <- Indebtedness	69.7381
Q21.16 <- Investment and savings	17.7415	Management <- Financial behavior	31.6724
Q21.17 <- Planned consumption	12.8492	Centrality <- Materialism	16.8559
Q21.18 <- Planned consumption	37.7823	Planned consumption <- Financial behavior	24.6789
Q21.19 <- Planned consumption	5.4791	Degree of self-control <- Indebtedness	84.3182
Q21.2 <- Financial management	21.2421	Use of credit <- Financial behavior	4.9132
Q21.3 <- Financial management	24.5508	Happiness <- Materialism	20.6897
Q21.4 <- Financial management	20.8767	Investment and savings <- Financial behavior	17.8610
Q21.9 <- Use of credit	23.0002	Q23.1 <- Rationality	20.2504
Q22.1 <- Centrality	24.4713	Q23.2 <- Rationality	18.434
Q22.2 <- Centrality	28.7874	Q23.3 <- Rationality	15.3421
Q22.3 <- Centrality	56.9627	Q23.4 <- Rationality	7.4649
Q22.4 <- Happiness	52.8054	Q23.5 <- Rationality	13.0641
Q22.5 <- Happiness	55.6405	Q23.6 <- Rationality	18.9346
Q22.6 <- Happiness	31.1987	Q23.9 <- Rationality	7.7291
Q22.7 <- Success	38.7113	Q24.1 <- Risk perception	6.0692
Q22.8 <- Success	59.1178	Q24.2 <- Risk perception	6.8393
Q22.9 <- Success	20.6446	Q24.3 <- Risk perception	6.8800
Q20.1 <- Moral impact	12.1432	Q24.4 <- Risk perception	6.6118
Q20.2 <- Moral impact	2.4578	Q24.5 <- Risk perception	6.2020
Q20.4 <- Preference over time	90.4138	Success <- Materialism	17.226

Source: Research data

By analyzing the sign of the coefficients, one can evaluate whether the model’s hypotheses have been confirmed. The sign of the coefficient of the financial behavior factor is negative (-0.326), confirming hypothesis 1. This means that financial behavior is relevant to curb a person’s getting into debt in order to acquire goods and services. Chen and Volpe (1998) and Disney and Gathergood (2011) confirm this result.

The sign of the materialism factor coefficient is positive (0.175), thereby confirming hypothesis 2. Thus, the way students organize and prioritize their values – placing the acquisition of goods and services at the center of their lives – influences them to have greater propensity for indebtedness. The influence of materialism on indebtedness is also confirmed in the studies by Watson (2003), Moura (2005), Ponchio (2006), Flores (2012), and Santos and Souza (2014).

The sign of the coefficient of the rationality factor is negative (-0.101), thus confirming



hypothesis 3. This indicates that the rational judgment that is used in the decision-making process is relevant to reduce one's getting into debt in order to acquire goods and services.

The sign of the coefficient of the risk perception factor is negative (-0.130), confirming hypothesis 4 that the higher the risk perception, the lower the propensity for indebtedness. The influence of risk perception on indebtedness is also confirmed in the studies by Caetano et al. (2011) and Flores (2012).

### 4.3 Analysis of results

To analyze whether there is a difference in the level of factors between the indebted and non-indebted groups, the Mann–Whitney *U* test was used to compare means, since the prerequisites of data normality (Kolmogorov–Smirnov test) and homogeneity of variances (Levene's test) were not met simultaneously (Table 8).

According to the descriptive statistics of the factors (Table 8), the highest result was achieved by the risk perception factor (mean of 4.1 and median of 4.3). One can see that students have high risk perception. Flores (2012) has a similar conclusion (mean of 3.6 and median of 4.0). The Mann–Whitney *U* test (p-value of 0.148) concludes that there is no difference in behavior between the indebted and non-indebted groups (Table 7).

The materialism factor has lower descriptive statistics than the risk factor (mean and median of 2.8), but with a materialistic tendency, indicating that students want more money, because possessing money represents happiness and well-being in their lives. Flores (2012) and Santos and Souza (2014) obtained similar results (Table 7). The Mann–Whitney *U* test (p-value of 0.802) concludes that there is no difference in behavior between the indebted and non-indebted groups (Table 8).

**Table 7** – Descriptive statistics of the factors

Factors	Kolmogorov–Smirnov test				Levene's test (based on mean)		Mann–Whitney <i>U</i> test		
	Has debts		No debts		p-value	Does it have homogeneity of variances?	p-value	Are the medians equal?	Is there a difference in behavior between indebted and non-indebted individuals?
	p-value	Does it have normal distribution?	p-value	Does it have normal distribution?					
Net	0.000	no	0.000	no	0.200	yes	0.191	yes	No difference
Financial Behavior	0.200	yes	0.200	yes	0.002	no	0.000	no	there is a difference
Materialism	0.200	yes	0.200	yes	0.044	no	0.802	yes	No difference
Rationality	0.000	no	0.000	no	0.007	no	0.000	no	there is a difference
Risk Perception	0.000	no	0.000	no	0.184	yes	0.148	yes	No difference

Source: Research data

The indebtedness factor (mean of 1.7 and median of 1.6) demonstrates that students agree with the principle defined by society of not spending more than one earns and not getting into debt; additionally, they indicate that they have knowledge about the amount of their debts and show preference for cash purchases (Table 7). Flores (2012) and Santos and Souza (2014) come to the same conclusion in their research. Although students in São Paulo show a low propensity for indebtedness, it must not be forgotten that 50% have their monthly income committed to debt, showing that behavior does not always follow the financial attitude. The Mann–Whitney *U* test (p-value of



0.191) concludes that there is no difference in behavior between the indebted and non-indebted groups (Table 8).

**Table 8** – Kolmogorov–Smirnov test, Levene’s test and Mann–Whitney U test

Factors	Has debt				Has no debt				Total			Flores (2012)		Santos & Souza (2014) *
	Mean	Standard deviation	Median	Average rank	Mean	Standard deviation	Median	Average rank	Mean	Standard deviation	Median	Mean	Median	Mean
Net	1.7	0.7	1.5	153	1.7	0.6	1.7	166	1.7	0.7	1.6	1.9	2.0	1.0
Financial Behavior	3.1	0.6	3.1	129	3.5	0.5	3.6	191	3.3	0.6	3.4	2.6	2.6	
Materialism	2.8	0.8	2.9	161	2.8	0.8	2.8	159	2.8	0.8	2.8	2.3	2.2	2.6
Rationality	3.7	0.7	3.9	139	4.0	0.6	4.0	180	3.9	0.7	4.0			
Risk Perception	4.1	0.9	4.3	167	4.1	0.8	4.2	153	4.1	0.8	4.3	3.6	4.0	

(\*) Adjusted values for a 5-point scale

Source: Research data

The financial behavior factor (mean of 3.3 and median of 3.4) indicates that students are concerned with managing their money better, saving frequently, not buying on impulse, and comparing prices before purchasing goods and services (Table 7). Flores (2012) has a similar conclusion, although with a profile of less control over personal finances (mean and median of 2.6). The Mann–Whitney *U* test (p-value of 0.000) concludes that there is a difference in behavior between the indebted and non-indebted groups (Table 8), where the non-indebted group has better financial behavior.

The rationality factor (mean of 3.9 and median of 4.0) indicates a high level of rationality, i.e., students have a weighted choice process that follows consistent criteria when it comes time to purchase (Table 7). The Mann–Whitney *U* test (p-value of 0.000) concludes that there is a difference in behavior between the indebted and non-indebted groups (Table 8), where the non-indebted group has a higher level of rationality.

The conclusion is that the financial behavior and rationality factors influence the level of indebtedness of students. The better one’s financial behavior and the greater the rationality in one’s decision-making process, the lower the level of indebtedness.

## 5 FINAL CONSIDERATIONS

The primary objective of this research was to verify the existence of an association between the behavioral factors – materialism, risk perception, rationality, and financial behavior – and the propensity for indebtedness among university students. Structural Equation Modeling was used to measure the factors. The survey obtained 319 valid questionnaires, of which 159 students claimed to be in debt. There were four main empirical results.

First, the model suggests that the financial behavior factor has a stronger interior effect on the propensity to get into debt. This means that there are indications that students’ financially appropriate behavior may influence a lesser propensity for indebtedness. The second most relevant factor is materialism, wherein the way they organize and prioritize their values contributes to the acquisition of goods and services, increasing the propensity for indebtedness.

Second, the degree of indebtedness is influenced by sociodemographic variables. The groups of women, Black/Brown people, people in a stable relationship, and people with employ-



ment and monthly income, have higher levels of indebtedness. The main sources of financing are credit cards and debit cards/overdraft protection. The main reasons for indebtedness are compulsory purchasing, money mismanagement, and easy access to credit.

Third, students have a high-risk perception, have a materialistic tendency in which possessing money represents happiness and well-being, and demonstrate agreement with the principles of not spending more than they earn and not getting into debt. Although they demonstrate knowledge about the amount of their debts and show a preference for cash purchases, 50% of them have their monthly income committed to debt, showing that one's behavior does not always follow one's financial attitude.

Fourth, the financial behavior and rationality factors present different levels when comparing the groups of indebted and non-indebted college students. Those with better financial behavior and greater rationality do not have debts.

Regarding the limitations of the research, it can be said that the data collection was carried out in a metropolitan region where the cohort surveyed has specific characteristics that make it difficult to generalize the results. Moreover, one can question the reliability of the responses collected.

The results of the research can contribute to several actions. There is room for university professors and administrators to develop more appropriate financial behavior, to avoid risky behavior when using credit cards and debit cards/overdraft protection services, thereby improving financial well-being in early adulthood. Additionally, there is room for promoting integrated programs between parents and children with the aim of emphasizing the possibility of happiness and stress control, in addition to the desire for and possession of goods.

For future work, we suggest expanding the group of respondents to different types of consumers, such as high school, graduate school, and public-school students.

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### Contribution of authors.

Contribution	[Author 1]
1. Definition of research problem	√
2. Development of hypotheses or research questions (empirical studies)	√
3. Development of theoretical propositions (theoretical work)	√
4. Theoretical foundation / Literature review	√
5. Definition of methodological procedures	√
6. Data collection	√
7. Statistical analysis	√
8. Analysis and interpretation of data	√
9. Critical revision of the manuscript	√
10. Manuscript writing	√
11. Other (please specify)	

