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Parents Influence Responsible Credit Use in Young Adults: Empirical Evidence from the United States, France, and Brazil

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Abstract

From the start of adulthood, consumers are frequently faced with complex financial decisions, and the consequences of these decisions may be reflected throughout the rest of their lives. As access to credit has expanded among college students around the world, it is critical that we understand both universal and culture-specific processes. Although some work has examined credit card use in two cultures simultaneously, there is, to our knowledge, no research examining such use in three cultures on three continents and across both genders. This study analyzes credit card use behavior among 1458 young adults living either in Brazil, the United States, or France. A structural equations model is used to incorporate relationships between the latent variables. The model, which was validated by the study, examines how financial well-being is affected by the way in which the individual uses credit cards, which in its turn is affected by social comparison and by financial self-confidence, the latter being also impacted by the financial education received from the parents. In the comparison between groups we found evidence that men are more dependent on parental education than women.

Keywords Credit cards · Financial well-being · Cross-cultural studies · Financial literacy

Motivation

Researchers on financial literacy and financial well-being argue that consumers are faced with complex financial decisions from the start of adulthood, the consequences of which may affect them for years to come (Lusardi et al., 2010). So studies, like those by Letkiewicz et al. (2019), Mendes-Da-Silva et al. (2012), Norvilitis & Mendes-Da-Silva (2013), have examined the predictors of the indebtedness and financial well-being of young adults, with the intention of identifying positive financial habits (OECD, 2020). Research in this field is both relevant and timely, because evidence indicates that financial well-being is associated with both lower levels of stress and higher levels of satisfaction with life and, in extreme cases, personal financial crises have been a motive for suicide (Ming & Chen, 2021; Mae, 2005; Norvilitis & Santa Maria, 2002; Norvilitis et al., 2003).

In dealing with credit at a level that is personal in nature but that has international implications, a critical topic is credit cards (Cloutier & Roy, 2020; Kara et al., 1996). Understanding credit card use is important to create a good environment for international business, especially when considering international commerce (Chakravorti & To, 2007; Economides, 1996; EY, 2015; UNCTAD, 2015) and global crises like Covid-19 (Gordon-Wilson, 2021). Because credit cards allow consumers to borrow money easily in order to satisfy their purchasing desires (Lo & Harvey, 2011), a lot of attention has been paid to this financial instrument. Research into credit cards in the United States and Europe has

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identified important predictors of use among young adults, including demographic, social, educational, and personality factors. However, much remains to be understood about how these factors work together, how these predictors vary across cultures, and whether one model is able to predict financial well-being across multiple cultures.

As access to credit has expanded among college students around the world, it is critical that we understand both universal and culture-specific processes. Although some work has examined credit card use in two cultures simultaneously, there is, to our knowledge, no research examining such use in three cultures on three continents and across both genders. Thus, the objective of this research is to analyze the credit card use behavior of both young men and women living in Brazil, the United States, and France. It was conducted by proposing and testing a model of structural equations that considers financial well-being, as a function of credit card use behavior, social financial comparison, self-confidence in financial management, and the financial education passed on to college students by their parents. The analysis is a male-female comparison based on data collected about financial behavior of young adults living in São Paulo (Brazil), New York (United States), or Grenoble (France).

Background

Culture and Credit Card Use

To date, there is limited comparative transnational research exploring evidence in different institutional environments. Following arguments from Hantrais (2009), Landman and Carvalho (2016), and Pennings et al. (1999), we chose three different countries using the Most Different System Design (MDSD) procedure to analyze a single topic across different contexts: Brazil, France, and United States. These countries are different in a variety of ways, e.g., language, Information and Communications Technology (ICT) literacy and infrastructure, size and complexity of financial industry, and culture, among others.

Comparative studies of credit card behavior among college students are particularly relevant in view of the fact that the credit market aimed at young adults, especially college students, has been growing fast in emerging countries, like Brazil, while new legal restrictions have been adopted in the United States to limit access, and Europe has continued to rely more heavily on debit than credit cards. Thus, it is important to examine these issues in a variety of cultures to assess whether conclusions are culture-specific or more universal. In the present study, three cultures with very different histories of credit and methods for funding college education, which is likely related to college student debt overall, were examined.

Brazil's approach to financing higher education falls between that of the United States and France. Students attending public universities are subsidized, with about 230,000 students attending college for free. Students attending private institutions may be eligible for low interest loans or partial or complete scholarships. Credit cards are much more common in Brazil than in France, with 207.4 million cards in circulation in 2011, up from 124 million just three years earlier (www.euromonitor.com), resulting in about four credit cards per person. This is particularly concerning because market fluctuations in Brazil have caused credit card interest rates to spike, topping 400% annual percentage rate in 2015 and 2016 (Garber, 2015), making it difficult to emerge from credit card debt once a person is unable to pay the entire bill monthly.

Although France is a developed economy like the United States, the national approach to money is very different. In France, college is heavily subsidized by the government and costs just 184 Euros per year. In addition, 35% of students receive grants to finance that cost, resulting in just 0.10% students with student loans (Del Rey & Schiopu, 2015). Further, credit cards are much less common in France. Euromonitor International (www.euromonitor.com) estimates that there are 34 million credit cards in circulation, which means that there is about one credit card for every two people. Consequently, college student debt, both in terms of loans and consumer debt, is much less common in France and, not surprisingly, there is little research on such debt. However, research on compulsive online buying among college students found that 16% reported high levels of such behavior, indicating that despite overall low levels of debt, some students still have financial difficulties (Duroy et al., 2014), warranting the inclusion of France in this study.

The United States has been undergoing a substantial change in students' access to credit. The 2009 Credit Card Accountability Responsibility and Disclosure Act (Credit CARD Act) limited access to credit cards among college students under the age of 21. Sallie Mae (2013), which regularly examines how students pay for college, reported a drop off in credit card possession following the implementation of the act. In 2010, 42% of college students reported having a credit card. By 2013, only 30% reported having a card. The decline is steep among first year students: in 2013, only 14% of freshmen had a credit card, compared with 21% just a year before. American students are increasingly turning to debit cards, with 77% having one. Nonetheless, 19% of students report credit card balances of $500 or greater (Sallie Mae, 2013), although, with an average annual percentage rate of 15.07%, the consequences of carrying a balance are less dire than in Brazil (Dilworth, 2016). Few students pay for college with credit cards and, when credit cards are used, they

supplement other ways of paying. Instead, the largest share of college student costs is covered by scholarships and grants (30%), with loans to students and parents comprising 27% of education costs. The average student loan amount increased from $5,327 in 2009 to $8,815 in 2013 (Sallie Mae, 2013).

Gender and credit card use

The implications of gender on financial behavior are of interest to the financial industry and the finance community around the world, but results are conflicting. In studies in the United Kingdom and the United States, Davies and Lea (1995), Norvilitis et al. (2003), and Norvilitis et al. (2006) found no significant differences between men and women in terms of their indebtedness. However, in a Chinese study, Wang et al. (2011) state that men tended to get into debt more frequently than women, while Yilmazer and Lyons (2010), studying 26,896 students from 10 North American universities, found that women were more likely to have debts on their credit card in excess of one thousand dollars, not to pay the bill in full for a period equal to or greater than 2 months, and to exceed their credit card limit.

Similarly, Faber and O'Guinn (1992) and d'Astous et al. (1990) argue that women tended to get into debt more easily than men because they erre more likely to fall into compulsive buying behavior. Brazilian authors have argued that the financial behavior of women must be better and more fully investigated in view of the fact that they still do not have the financial autonomy that men already possess. This phenomenon is reflected in recently published data about the determinants of well-being in the city of São Paulo. When compared with men, women reported being less satisfied with their financial life and with their retirement savings (Well Being Brazil Index, 2014).

Theory, model, and hypotheses

The theory of planned behavior (Ajzen, 1991) conceptualizes behavior as the result of a combination of attitudes, subjective norms, and perceived behavioral control. Chudry et al. (2011) reported support for this model in a study involving student loans, for all three of these factors were found to affect intention to borrow, although less research has examined planned behavior as a model to explain credit card use based on credit card theory (Chakravorti & To, 2007). In the present study, we conceptualized problematic financial behavior, as measured by regret about credit card use and the worries about debt, as resulting from a combination of these influences. Thus, we expected that financial behavior would be predicted by subjective norms, as measured by social comparison, students' attitudes concerning financial self-confidence, and by perceived behavioral control, which is assumed to be related to parental modeling of financial behavior.

According to Tenenhaus et al. (2004), structural equation modeling (SEM) allows the simultaneous statistical regression of a group of equations that are different from one another, which enables the relationship between latent variables (non-observable) and their indicators (observable) to be checked. Based on the argument that young adults' credit card usage might also be influenced by their community and societal level elements such as friends, classmates, and others, or even by commercial banks, we tested a structural model used by Braun Santos et al. (2016), in order to consider different aspects concerning credit card usage and financial well-being in three different countries (Campbell & Pugliese, 2021; Gonçalves, et al., 2021; Ming et al., 2021; Sotiropoulos & d'Astous, 2013). The present study tested a model of structural equations that considers financial well-being, as a function of credit card use behavior, social financial comparison, self-confidence in financial management, and the financial education passed on to young people by their parents. Figure 1 shows the path diagram between the latent variables of the structural model.

This model was tested initially in the work of Braun Santos et al. (2016), but only with women and in two countries: the United States and Brazil. This study expands the analysis to a dataset that adds data from France and also includes men. Each of the hypotheses inherent in the model tested is now discussed below. The main contribution of this study is supported by three tenets. First, the data employed in this study constitute a unique set of observations using the same collection instrument in three different countries: Brazil, the United States, and France, with both men and women to enable greater external validity, bearing in mind the cultural and institutional environment differences. Second, two different methods were used to test the empirical model, and the adjustment of these methods was checked by way of an ample set of goodness of fit measures. Third, unlike previous works, like the studies by Braun Santos et al. (2016) and Potrich et al. (2016), the isolated relationships between the latent variables that are the components of the structural model are not the only ones considered.

In their examination of the role of parenting, Norvilitis & MacLean (2010) reported that parental variables are significantly related to problems of credit card management among university students. These effects, however, seem to be in part mediated by other, proximal variables, such as delayed financial gratification and compulsive buying. In a study that examined the influence of parental interactions on credit card use behavior among students from seven universities, Hancock et al. (2013) found that the participation of parents as positive models is critical. Limbu et al. (2012) also highlight the importance of the parents in terms of confidence and the balanced use of credit cards, adding

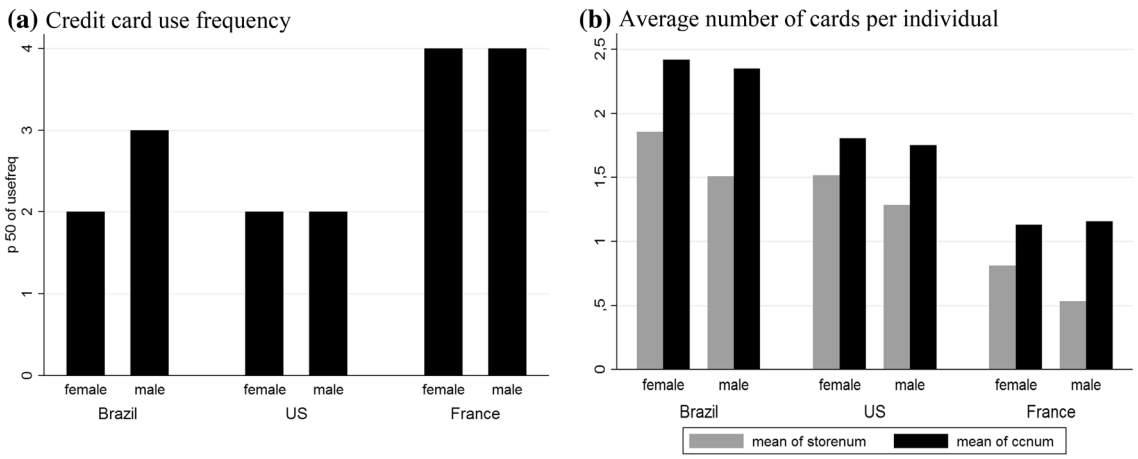

Fig. 1 Number of personal cards and use frequency. usefreq is the use frequency of credit cards reported in the categories: 1- Only in emergency situations; 2- Less than once a week; 3- Once a week; 4- A few times in the week; 5- Daily or more than once a day. storenum and ccnum are the number of store cards and credit cards, respectively, reported per individual. **a** Credit card use frequency and **b** Average number of cards per individual

that female students with less influence from their parents are at greater risk.

Lusardi et al. (2010) used a sample with 7417 young Americans between 12 and 17 years old and stressed the importance of the influence of the parents when it came to young people acquiring financial knowledge before they become involved with contracts and begin taking financial decisions. Norvilitis & Mao (2013) find that for a sample of Chinese students 'parent worries', one of the indicators on the parental financial education scale, has a positive influence on financial self-confidence. Because considerable research supports the important role of parents in student financial behavior and attitudes, we expected similar results, formulated in Hypothesis **H1**.

H1 The better the financial education received from the parents (PFES), the greater the financial self-confidence will be (FSC).

Related to financial self-confidence, in a study of 2098 first year college students, Shim et al. (2010) examined a financial socialization model by way of structural equations to explain how young adults acquire financial attitudes, behavior and knowledge. Results indicated that greater participation by parents, especially when a new task involving financial management is being carried out, may encourage young people to adopt healthier financial attitudes and behavior, including a greater sense of financial self-confidence. Further, such self-confidence was related to positive outcomes, such as delay of gratification. Conversely, a lack of self-confidence is related to negative outcomes, such as compulsive buying (Roberts & Jones, 2001).

One of the results of the empirical model tested was that financial attitudes and behavior were more strongly influenced by the individuals' self-assessment than by objective knowledge, which led the authors to conclude that objective knowledge does not fully capture the multiple dimensions of financial knowledge and to stress the role played by financial self-confidence in the financial behavior of young people. Given this, we expected to find a connection between financial self-confidence and credit card behavior. Therefore, we proposed Hypothesis **H2**.

H2 The greater young people's self-confidence in financial management (FSC) is, the less regret with regard to credit card use (CCUS) they will report.

Respect to financial social comparison, various studies have reported compulsive purchasing behavior and the harmful effects it has on an individual's well-being. Norvilitis & MacLean (2010) showed that people disposed to postpone their financial gratification and who are less likely to purchase impulsively are less subject to the problematic use of credit cards. Before this, O'Guinn and Faber (1989) had already shown that compulsive consumers tend to have more credit cards than other people. Compulsive buyers are often motivated by the wish to possess the goods others own (Durkin, 2000; Mowen, 2000; O'Guinn & Faber, 1989; Roberts, 2000). Further, lower levels of social comparison are related to satisfaction with income and success (McBride, 2010) and lower levels of debt among adults (Lea et al., 1995), as well as to financial well-being among American college students (Norvilitis & Mao, 2013). Although, to our knowledge, no research has directly related financial social

comparison and credit card behavior, based on this line of argument, Hypothesis **H3** is proposed.

H3 Greater levels of financial social comparison (FINSOC) will predict greater regret due to credit card use (CCUS).

Examining credit card use and perceived financial well-being**,** Norvilitis et al. (2003) defined financial well-being as the perception of the individual with regard to their current and future financial situation. The measure of financial well-being proposed by Norvilitis et al. (2003) aims to measure the feelings of personal confidence, current financial security and future financial expectations. In another study, Norvilitis et al. (2006) found results that suggest that individuals with a greater degree of credit card indebtedness tend to suffer from high levels of stress and experience less of a sensation of financial well-being.

In turn, Norvilitis & MacLean (2010) found that the possession of a large number of cards, when associated with their indiscriminate use, the frequent use of the maximum limit and the non-payment of the bill in full, significantly reduce the perception of financial well-being. Being in debt, in addition to minimizing the sensation of general satisfaction with life and satisfaction with one's finances, reduces the sensation of physical well-being and increases the perception of negative feelings, like depression (Shim et al., 2010). Based on these arguments, Hypothesis **H4** is proposed.

H4 The greater the regret about credit card use (CCUS), the worse will be the perceived financial well-being (FWBS) of the individual. That is, students will report greater concern about their level of indebtedness.

Method

Data Collection and Participants

As Table 1 illustrates, the database comprises 1,458 individuals, of whom 814 (56%) live in São Paulo, 443 (30%) in New York, and 201 (14%) in Grenoble. The data employed in this research were collected by way of a survey with young adults living in the city of São Paulo (Brazil), in Buffalo, New York (USA) or Grenoble (France), who voluntarily replied to the questionnaire used (which can be obtained by writing to the authors of this work). Data collection took place between March 2012 and June 2013. We followed published recommendations regarding international use and design of questionnaires; our concern was to precisely assure validity and translation in English, Portuguese, and French (Brancato et al., 2006; Breakwell et al., 2006; Harzing & Salciuviene, 2005). This is important because the increasing relevance of multinational companies has made researchers realize that business theories, including credit card use theory, and concepts developed in one part of the world (usually the United States) may not be applicable across borders (Harzing & Salciuviene, 2005).

Participants were recruited from a variety of departments and courses across each campus to assure that the samples were representative of each college. Both credit card users and non-credit card users participated. Instructors awarded extra credit for participation. Following a description of the study, students were given the opportunity to take a survey packet to complete. Surveys were completed outside of class and returned to the class in which they were distributed. Because students were not required to take a packet, it is not possible to determine the response rate. The information collected was hand-written on three printed documents: a consent form, a questionnaire, and an answer sheet. Upon return, consent forms were immediately separated from the answer sheet so that all responses were anonymous.

The respondents were asked about the frequency with which they use credit cards: 1 (*Only in emergency situations*); 2 (*Less than once a week*); 3 (*Once a week*); 4 (*A few times in the week*); 5 (*Everyday, or more than once a day*). Figure 2 shows the median in use frequency and the average number of credit and store cards reported per respondent in each country and separated by gender. It is worth noting that young residents in France use cards more frequently than Brazilians or Americans, but despite this they are the ones who have the least number of credit or store cards. Note also that women have a greater number of store cards or credit cards than men. This observation is valid for the

Table 1 Composition of the Dataset by Country and Gender

	Total		Women		Men	
	Freq	%	Freq	%	Freq	%
Brazil	802	0.56	436	0.30	366	0.25
United States	441	0.31	348	0.24	93	0.06
France	201	0.14	117	0.08	84	0.06
Total	1,444	1	901	0.62	543	0.38

Prepared by the authors based on data collected by them. Of the 1,458 questionnaires considered valid, 14 respondents did not supply their gender

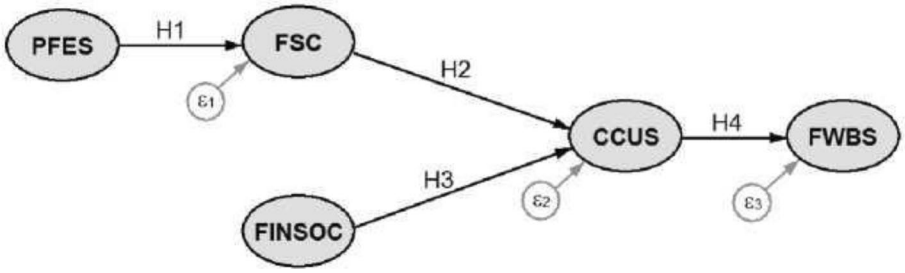

Fig. 2 Empirical structural model tested. Proposed structural model by Braun Santos et al. (2016). PFES, Parent Financial Education Scale; FSC, Financial Self-Confidence; FINSOC, Financial Social Comparison; CCUS, Credit Card Use Scale; FWBS, Financial Well-Being Scale

three countries analyzed, with the exception of credit cards in France, where men have a slightly higher average than women.

As in Braun Santos et al. (2016), the constructs analyzed in this study are formed by five main groups of questions: Financial Well-Being Scale, specifically concern about debt, (FWBS; Norvilitis et al., 2003), Financial Self-Confidence (FSC; Norvilitis & Mao, 2013), Modified Credit Card Use Scale, specifically regret related to credit card use, (CCUS; Raghubir & Srivastava, 2008), Financial Social Comparison (FINSOC; Norvilitis & Mao, 2013) and Parental Financial Education Scale (PFES, Norvilitis & MacLean, 2010). Table 2 presents a summary of the definition of the constructs and the number of indicators (statements) used to measure them. A 5-point Likert scale was used for all five indicators, where 1 is 'I strongly agree' and 5 is 'I strongly disagree'. The scales of some of the indicators were inverted so that the highest scores were interpreted as Table 2 suggests. The indicators used in reverse scale are identified by the suffix *r* in Fig. 3, and the original statements are shown in Table 3.

Results

In this section, we initially discuss the level of fit of the estimated models using two different methods, ADF and ML. The results obtained for the structural model are then analyzed. Finally, multi-group analysis is carried out with the intention of checking the impact of gender and the parents on the coefficients estimated in the structural model.

Checking Model Fit

Before discussing the empirical results obtained in this study, it is worth highlighting considerations about the estimation methods adopted in this research. To help produce greater robustness in the results, two techniques for estimating the empirical model are employed: the Asymptotic Distribution-Free (ADF) method and the Maximum Likelihood (ML) method. In the order in which these methods were listed they gradually present more restrictive hypotheses. The asymptotic distribution-free method is an estimator of Generalized Moments (GMM) and not supported by the assumption of joint normality, or even data symmetry. However, it is less efficient than the ML method, when the ML assumptions are valid. Maximum Likelihood is the most widely used estimation method in analyses that employ structural equations (SEM), because it requires fewer data for its convergence and conditional normality is sufficient for obtaining consistent estimates.

The presence of categorical indicators may cause non-normality (McDonald & Ho, 2002). In fact, this was found using the skewness and kurtosis tests of Mardia, Henze-Zirkler and Doornik-Hansen. According to McDonald and Ho (2002), however, studies suggest that the estimates carried out using the ML method seem fairly robust against normality violations. In this sense, in this work we chose to present the estimated parameters using the two methods, in such a way that convergence, or otherwise, of the results may supply more information and support interpretations based on stricter criteria.

Table 2 Constructs Forming Part of the Empirical Model Tested

Acronym	Latent variables (constructs)	Definition	# Indicators[a]
FWBS	Financial Well-Being Scale	High scores indicate better perceived well-being	10
FSC	Financial Self-Confidence	High scores indicate greater self-confidence in financial management	10
CCUS	Modified Credit Card Use Scale	High scores point to greater responsibility in credit card use	30
FINSOC	Financial Social Comparison	High scores indicate less of a desire to own the goods others have	9
PFES	Parental Financial Education Scale	High scores indicate better financial education transmitted by the parents	34

See the list of significant indicators for each latent variable on Table 3

[a]The preliminary whole list of indicators can be seen on the questionnaire we share together this paper

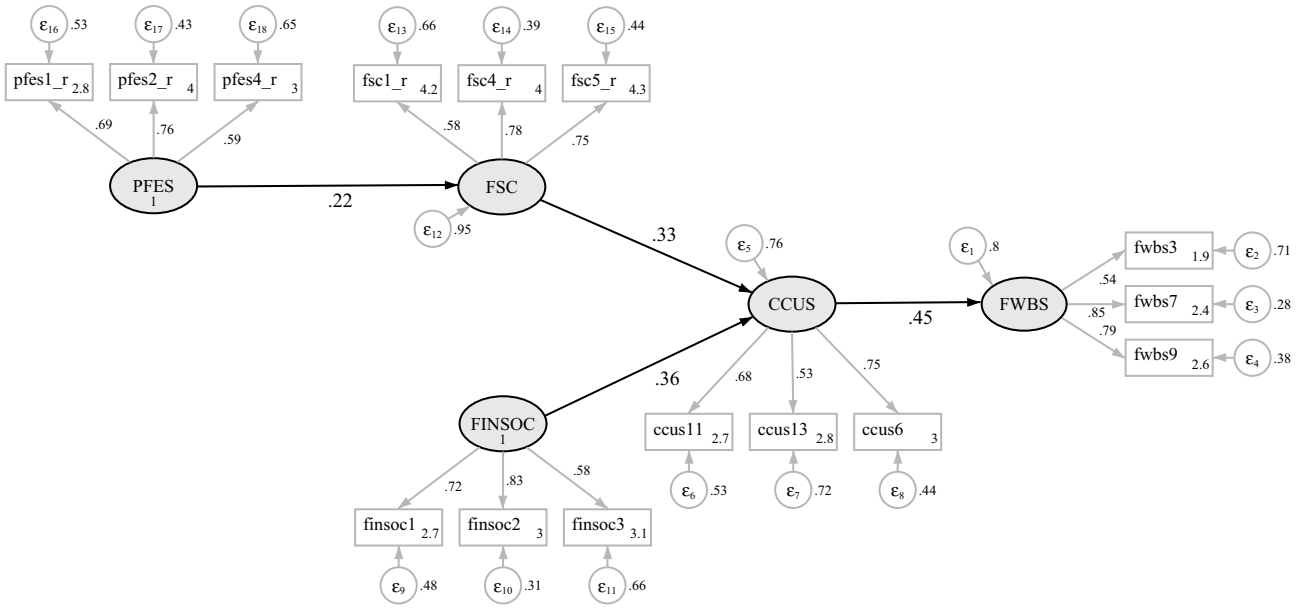

Fig. 3 Structural model estimated using the ADF method. This diagram shows the standardized estimates. Values on the arrows represent the betas and the values within the rectangles, the constant. Values alongside the errors represent their variance. *PFES* Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

Table 3 Component Observable Variables of the Model and its Indicators

Variables and indicators	Statement	Main references
FSC	Financial Self Confidence	Shim et al (2010)
fsc1	I'm confident that I know how to handle my money	
fsc4	I trust my capacity to deal with credit cards	
fsc5	I trust my capacity to deal with bank accounts	
FINSOC	Financial Social Comparison	McBride (2010)
finsoc1	When I see the things others have, like clothes and an automobile, I would often like to have all that too	
finsoc2	I usually compare what I have with what my friends have	
finsoc3	I'm happy when I see I have nicer things than other people	
CCUS	Modified Credit Card Use Scale	Durkin (2000)
ccus6	Every month I'm afraid to receive my credit card bill	
ccus11	I regret the amount of my card bills when I finally have to pay them	
ccus13	I buy unnecessary items when I use my credit card	
PFES	Parental Financial Education Scale	Lusardi et al. (2010), Norvilitis & Mao (2013)
pfes1	My parents taught me how to manage a check book adequately	
pfes2	My parents considered it important to teach me about money	
pfes4	My parents talked to me about the appropriate use of credit cards at college	
FWBS	Subjective Financial Well-Being	Norvilitis et al. (2006)
fwbs3	I worry about my credit card payments	
fwbs7	I think a lot about my current debts	
fwbs9	I frequently find myself thinking about my debts	

We use the following scale: 1-I strongly agree 2- I agree 3-I neither agree nor disagree 4-I disagree 5-I strongly disagree

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

Despite each construct (or latent variable) initially containing a considerable number of indicators (see Table 2), the number of indicators belonging to each construct needed to be reduced considerably to achieve convergence in the estimation methods and satisfactory adjustments of the measuring model, validities and reliability. Models with a high number of indicators need bigger samples and estimation methods with fewer restrictive hypotheses (McDonald & Ho, 2002). So the final model only contained three indicators in each construct, as Table 3 reports.

Table 4 shows the adjustment level for the validity and reliability of the estimated constructs using the ADF and ML methods. Composite Reliability (CR) and Average Variance Extracted (AVE) give the values recommended in literature (Bollen, 2014). The only exception is the value obtained for CR in the *CCUS* construct, which despite not exceeding the minimum value as recommended in the literature (0.7), gives a result (0.694) that is close to it. The adjustment measures of the Confirmatory Factor Analysis (CFA) model and the Structural model (SEM) can be seen in Table 5.

The two models using the two methods previously described—ADF and ML—are estimated. Because this has to do with adjustments to the complete sample, we see that both CFA and SEM gave values that were in accordance with the recommendations of literature. It is worth noting that the Standardized Root Mean Square Residual (SRMR) was below 0.09 and the Root Mean Square Error of Approximation (RMSEA) was less than 0.06, so that Hu and Bentler's Two-Index strategy was satisfied *(*Hu & Bentler, 1999*).*

Generally speaking, multi-group analysis for genders also gave good adjustment measures, particularly those of the ML procedure. Multi-group analysis by country did not converge by the ADF method and the measures obtained by way of the ML procedure are at the limit of the cut-off points suggested in the literature. The worst result was for the SRMR, which was probably affected by the sample sizes of the France and United States groups since this measure is sensitive to sample size, as Iacobucci (2010) points out.

Also, with respect to the comparison between groups it is worth stressing the invariance of the measure model, which is known in literature as factor invariance. The procedures for testing factor invariance are well-established and made increasingly easier because of powerful statistical packages. There is, however, no consensus among researchers with regard to acceptable levels of invariance and the procedure for testing them. Byrne et al. (1989) argue that if two or more loadings are invariant then the common factor measure may be considered equivalent between groups, so comparisons can still be made.

So in the gender comparison exercise a test score of the difference in the coefficients rejected the restriction at the 10% significance level for the indicators (p-value between parentheses): *pfes*4_*r* (0.0106) and *finsoc*1 (0.0300), in the estimation using the ADF method, and *pfes*4_*r* (0.0444), *ccus*6 (0.0020), *fsc*1_*r* (0.0215) and *fwbs*7 (0.0881) for the estimation that used the ML method. Considering that at least two of the three loadings of each construct were considered invariant, partial invariance could be a defense to the validity of the comparison between men and women, according to Byrne et al. (1989).

This same argument does not hold for the comparison between countries, where at the most only one of the indicators of each latent variable presented measure invariance. This is obviously a warning for the validity of the

Table 4 Results of the Construct Validities and Reliabilities

	Validity and reliability		Latent variables				
Panel A: ADF Method	CR	AVE	PFES	CCUS	FINSOC	FSC	FWBS
PFES	0.723	0.468	0.68				
CCUS	0.694	0.435	0.06	0.66			
FINSOC	0.762	0.521	0	0.38	0.72		
FSC	0.747	0.5	0.22	0.34	0.05	0.71	
FWBS	0.777	0.546	0.06	0.45	0.13	0.16	0.74
Panel B: ML Method	CR	AVE	PFES	CCUS	FINSOC	FSC	FWBS
PFES	0.72	0.463	0.68				
CCUS	0.691	0.432	-0.01	0.66			
FINSOC	0.736	0.489	-0.03	0.34	0.7		
FSC	0.741	0.49	0.24	0.37	0.03	0.7	
FWBS	0.745	0.504	0.11	0.38	0.09	0.18	0.71

Values recommended by Bollen (2014): CR > 0.7, AVE > 0.4. ADF indicates the asymptotic distribution-free estimation method; ML is the maximum likelihood method

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

Table 5 Global adjustment measures of the Confirmatory Factor Analysis (CFA) Model and the Structural Model (SEM)

Model	Group	N	χ^2	df	χ^2/df [a]	RMSEA[b]	pclose[c]	CFI[d]	SRMR[e]
CFA(ADF)		1117	236.12**	80	2.95	0.042	0.986	0.906	0.059
CFA(ML)		1117	247.61**	80	3.09	0.043	0.963	0.958	0.035
SEM(ADF)		1117	239.80**	86	2.79	0.04	0.997	0.907	0.062
SEM(ML)		1117	262.69**	86	3.05	0.043	0.975	0.955	0.039
CFA(ADF)	Gender	1104	420.77**	180	2.34	0.049		0.881	0.092
	Women	671							0.097
	Men	433							0.086
CFA(ML)	Gender	1104	426.12**	180	2.37	0.05		0.939	0.052
	Women	671							0.045
	Men	433							0.057
SEM(ADF)	Gender	1,104	507.17**	195	2.6	0.054		0.845	0.111
	Women	671							0.105
	Men	433							0.117
SEM(ML)	Gender	1104	476.95**	195	2.45	0.051		0.93	0.061
	Women	671							0.052
	Men	433							0.068
CFA(ML)	Culture	1117	1,037.38**	280	3.7	0.085		0.813	0.114
	Brazil	707							0.052
	USA	299							0.13
	France	111							0.139
SEM(ML)	Culture	1117	1,397.60**	350	3.99	0.09		0.764	0.173
	Brazil	707							0.065
	USA	299							0.167
	France	111							0.241

CFA indicates the Confirmatory Factor Analysis model, SEM the Structural model

ADF indicates the Asymptotic Distribution-Free Estimation Method, ML the Maximum Likelihood Method. Recommended values (Hu & Bentler, 1999)

[a] χ^2/df < 5 moderate < 3 good

[b] RMSEA < 0.10 moderate < 0.05 good

[c] pclose > 0.05

[d] CFI > 0.80 moderate > 0.90 good

[e] SRMR < 0.09. pclose is not calculated in multi-group analysis

** $p < .05$

comparison between countries. According to Bontempo et al. (2007), however, what is needed is to know the limit at which the lack of invariance presents a significant practical bias to a particular study, but what is actually tested is only the difference in the coefficients.

Structural Model

Figure 3 presents the estimation results of the model proposed by the ADF method. The standardized estimates of the parameters for the two estimation methods can be seen in Panel A in Table 6. Before analyzing the results obtained for these parameters and checking the proposed hypotheses, it is worth discussing how this model was constructed. The tested hypotheses are based on studies in which the dynamic between the constructs was examined in isolation. In other words, in proposition **H1**, which establishes that parental education induces greater financial self-confidence in young people, studies that checked this implication were used, but without considering the effect of other variables.

So to test this hypothesis in the structural model we analyze what level this relationship is maintained at within a broader context, in which other dynamics are observed. However, in creating a path from *PFES* to *FSC*, and from the latter to *CCUS*, we are discarding a possible direct effect from *PFES* to *CCUS*. In other words, we may be supported by evidence and previous theoretical arguments about the impact of financial self-confidence on behavior in credit card use, as well as the impact of parental education on self-confidence. But is there a direct and relevant impact of parental education on card use?

Table 6 Estimates of the Parameters in Path Models

Models	Procedures			
	ADF		ML	
Panel A: Final Model				
PFES → FSC	0.22	***	0.23	***
FSC → CCUS	0.33	***	0.37	***
FINSOC → CCUS	0.36	***	0.33	***
CCUS → FWBS	0.45	***	0.38	***
Panel B: Exogenous Correlations				
PFES → FSC	0.22	***	0.23	***
FSC → CCUS	0.33	***	0.37	***
FINSOC → CCUS	0.36	***	0.33	***
CCUS → FWBS	0.45	***	0.38	***
$Cov_{(PFES,FINSOC)}$	0.01		-0.03	
Panel C: FSC Mediation				
PFES → FSC	0.22	***	0.24	***
PFES → CCUS	0.00		-0.08	**
FSC → CCUS	0.33	***	0.39	***
FINSOC → CCUS	0.36	***	0.32	***
CCUS → FWBS	0.45	***	0.37	***
Panel D: CCUS Mediation				
PFES → FSC	0.23	***	0.23	***
FSC → CCUS	0.33	***	0.36	***
FINSOC → CCUS	0.36	***	0.33	***
FSC → FWBS	0.00		0.04	
FINSOC → FWBS	-0.05		-0.04	
CCUS → FWBS	0.47	***	0.37	***

Standardized estimates of the coefficients in the structural model. ADF indicates the asymptotic distribution-free estimation method and ML the maximum likelihood method

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

*$p < .10$. **$p < .05$. ***$p < .01$

To check this type of concern we need to test the mediating effects of the constructs. These results are also shown in Table 6. Moreover, the correlation between the exogenous latent variables, *PFES* and *FINSOC*, was also tested and no significant effect was found, as Panel B of Table 6 illustrates. To analyze the mediation relationship exercised by *FSC* of *PFES* on *CCUS*, a new path between *PFES* and *CCUS* was included. Therefore, a null effect was found using the ADF method and an almost null effect, despite being statistically significant at 5%, by the ML method.

Likewise, to test the mediation exercised by the *CCUS* of *FINSOC* and the *FSC* on *FWBS*, we included direct paths between them. No significant effect was found in any of the estimation methods. These tests therefore corroborate the validity of the proposed model. Returning to the final model, attention must first of all be paid to the fact that verification of the hypotheses, in the way in which the measure scale was oriented (see Table 2), implies the existence of positively significant coefficients between the constructs. All the estimated parameters were significantly greater than zero and ADF and ML estimates also gave close results. Figure 4 graphically represents the models whose measures are shown in Table 6; clockwise, starting in the upper left-hand corner, Panel A: Final Model, to the lower left-hand corner, *CCUS* Mediation.

The effect of the financial education transmitted by the parents (*PFES*) on self-confidence in the management of money (*FSC*) was confirmed in both the model estimation methods. This result is worth highlighting, since it fills a gap that is present in the work of Braun Santos et al. (2016), in which this effect was not confirmed by the ADF method. Table 7 reports the indirect effects between the constructs of the model. The significantly positive indirect effects of *PFES* on *CCUS* and *FWBS* corroborate the relevance of parental education in this context.

Multi-Group Analysis

Although some studies have reported differences between men and women with regard to self-confidence in personal financial management (Klontz Wada & Klontz, 2015), and others point out that women are more vulnerable than men in relation to uncontrolled spending behavior, in addition to having a greater inclination to compulsive purchasing (d'Astous, 1990; Harvanko et al., 2013; O'Guinn & Faber, 1989; Schlosser et al., 1994), no significant difference was found in the effects of *FSC* and *FINSOC* on *CCUS* (Table 8).

There was a difference between genders in the effect of the financial education provided by parents (*PFES*) on the self-confidence (*FSC*) of the individual, when estimated using the ADF method, but not when estimated by the ML method, as happened with the *CCUS* effect on *FWBS*. This disagreement is likely due to the assumptions of the estimation methods. On the one hand, non-normality can generate a bias problem in the ML method, on the other the ADF method demands a large sample size (Browne, 1984). Given that the number of women (671) and men (433) was sufficient to guarantee a reliable weight matrix in the ADF method the parameters estimated by this method must be correct.

To carry out the comparison between groups (gender or countries for instance), it is necessary to investigate the invariance of the measurement model. In their work on partial measurement invariance, Byrne et al. (1989) argues that if two or more loads are invariant then the common factor metric can be considered equivalent across groups and therefore comparisons can be made. A test score of the difference in coefficients in our SEM comparison between men and women rejected the 10% restriction for the items (*p*-value in

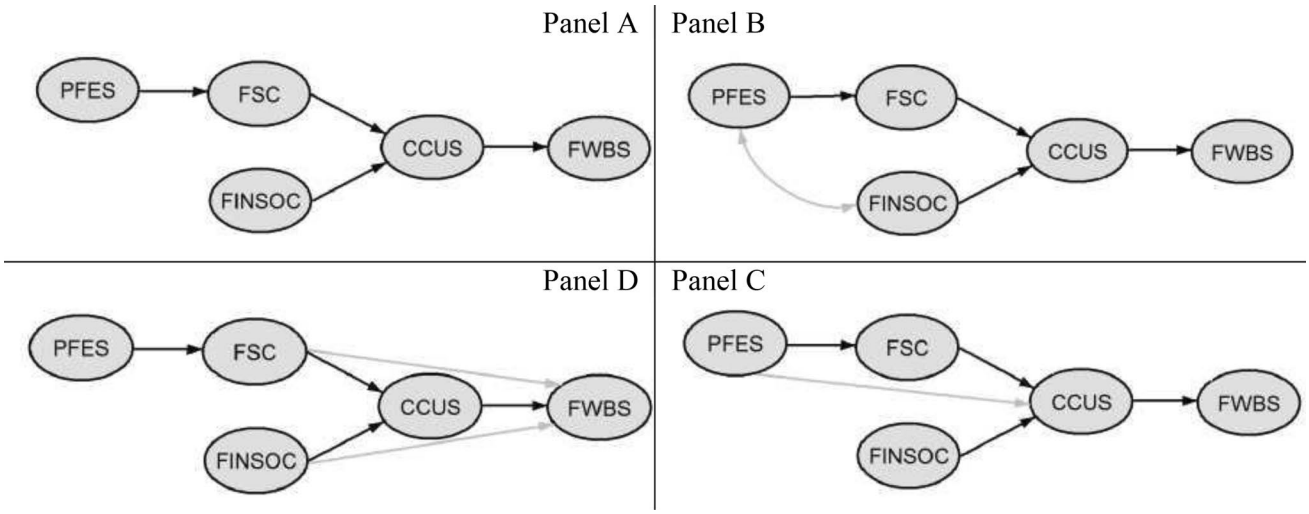

Fig. 4 Mediation effects on the empirical model (see coefficients on Table 6). Prepared by the authors from the results obtained. Clockwise: diagram A illustrates the Final model, whose measures are in Panel A of Table 6, to diagram D, which represents the CCUS Mediation model, whose measures are shown in Panel D of Table 6. *PFES* Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

Table 7 Indirect Effects Between the Component Constructs of the Structural Model

Indirect effects	Procedures	
	ADF	ML
PFES → CCUS	0.07***	0.08***
PFES → FWBS	0.03***	0.03***
FSC → FWBS	0.15***	0 14***
FINSOC → FWBS	0.16***	0.13***

Standardized estimates of the indirect effects on the structural model. ADF indicates the asymptotic distribution-free estimation method, ML the maximum likelihood method

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

*$p < .10$. **$p < .05$. ***$p < .01$

parentheses): *fwbs*7 (0.0881), *ccus*6 (0.0002), *fsc*1 (0.0215) and *pfes*4 (0.0444).

The evidence that financial self-confidence among men is more dependent on parental education is in line with the study by Edwards et al. (2007), which revealed that of 1317 young university students, women are more inclined to talk with their parents about financial matters on a personal level. Further, parental expectations may also play a role as different practices are adopted with regard to sons or daughters (Newcomb & Rabow, 1999). According to Bailey and Lown (1993), the etiology of these differences in attitude with regard to money may be, at least in part, attributed to the cultural differences that originate within the family context and are reinforced by society.

Therefore, differences among the three countries were examined more fully. Table 9 shows the estimates of the

Table 8 Results of the Inter-Gender Multi-Group Analysis

	Procedures					
	ADF			ML		
	Women	Men	$\chi^2(1)$	Women	Men	$\chi^2(1)$
PFES → FSC	0.16***	0.42***	12.07***	0.22***	0.23***	0.25
FSC → CCUS	0.26***	0 29***	0.33	0 40***	0.31***	0.78
FINSOC → CCUS	0 40***	0 40***	0.03	0 32***	0.34***	0.31
CCUS → FWBS	0 44***	0.59***	4.17**	0.38***	0.40***	0.23

Standardized estimates of the coefficients in the structural model. ADF indicates the asymptotic distribution-free estimation method, ML indicates the maximum likelihood method

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

*$p < .10$. **$p < .05$. ***$p < .01$

Table 9 Results of the Inter-Country Multi-Group Analysis (using the Maximum Likelihood method)

	Brazil	United States	France	χ^2
PFES → FSC	0,16***	0,21**	0,55***	19 04***
FSC → CCUS	0,32***	0,39***	0 71***	5,73*
FINSOC → CCUS	0,37***	0,20***	0,23**	9 44***
CCUS → FWBS	0,27***	0,43***	0 71***	20,27***

This table shows the estimates of the coefficients in a comparison between countries and the results of the Wald tests for equality of coefficients. The estimates were generated using the ML method (the ADF estimate is not reported because it did not converge). We also ran a test score of the difference in coefficients in our SEM comparison across countries, since but the Byrne et. al. (1989) was not attended to we do not report or discuss results related to comparison in country level. Standardized estimates of the coefficients in the structural model

PFES Parent Financial Education Scale, *FSC* Financial Self-Confidence, *FINSOC* Financial Social Comparison, *CCUS* Credit Card Use Scale, *FWBS* Financial Well-Being Scale

*p < .10. **p < .05. ***p < .01

coefficients in a comparison between countries and the results of the Wald tests for equality of coefficients. The estimates were generated using the ML method (the ADF estimate is not reported because it did not converge). We also ran a test score of the difference in coefficients in our SEM comparison across countries but the Byrne et. al. (1989) was not attended to. Differences were found for the items (p-value in parentheses): *fwbs*3 (0.0000), *fwbs*7 (0.0027), *fwbs*9 (0.0000), *ccus*6 (0.0000), *ccus*11 (0.0123), *ccus*13 (0.0356), *fsc*1 (0.0781), *fsc*5 (0.0526), *finsoc*3 (0.0221), *pfes*1 (0.0437) and *pfes*2 (0.0101). For the reasons discussed with regard to the goodness of fit measures of the estimated models, the results obtained must be examined considering their validity. The effects of parental education and financial self-confidence are higher for France, when compared with the results obtained for the United States and Brazil, as is the effect of credit card use for a feeling of well-being. These differences may be related to more frequent use of credit cards reported by French students (see Fig. 2).

These results may also find some support in the argument that France is characterized as a country having a culture that has a high aversion to uncertainty, as De Mooij and Hofstede (2002) detail, and according to whom people behave more cautiously when making decisions. This may therefore explain their greater dependence on parental support and their self-confidence in managing debt. The recent economic recession which European countries have experienced over the last ten years suggests there are impacts on the state of health of people, thus increasing the incidence of psychological disturbances and depression (De Belvis et al., 2012; Karanikolos et al., 2013), which leads to a consequent decrease in the feeling of well-being with regard to financial questions in the personal sphere. With regard to Brazil, it is worth highlighting the effect—which is greater than in the United States or France—that financial social comparison has on credit card use. This finding was seen by Braun Santos et al. (2016) in a study with female university students, based on a comparative approach between Brazilian and American female respondents. This work, which also considers male students and a European country, draws attention to this latent feature as being an important predictor of credit behavior for the Brazilian culture.

Discussion

Internationally, the path to profitability for credit card issuers has been increasingly challenged in recent years by a growing number of roadblocks and barriers, with high credit card default rates and a growing consumer preference toward debit card spending emerging as two of the most significant (EY, 2015). In response to these and other barriers, many banks have responded by reducing their credit appetites and narrowing their card offerings, resulting in narrower margins. Thus, from both industry and policy maker perspectives, it is important to understand the relationship between consumer behavior toward credit and well-being. It is particularly important to examine this among college students who are just beginning their financial paths.

The objective of this study was to analyze the credit card use behavior of young adults living in Brazil, the United States and France, as a function of their credit card use behavior, financial social comparison, their self-confidence in financial management and the financial education passed on to these young people by their parents. To do so, we employed a structural equations model based on a survey with 1,458 respondents following the theory of planned behavior.

The relationships among the Financial Social Comparison, Parental Financial Education, Financial Self-Confidence, and Modified Credit Card Use Scale and Financial Well-Being Scale were investigated. These effects were already seen in isolation in previous work. In this work the analysis was expanded to consider the joint dynamic of these factors. To do so a model of structural equations was replicated (Braun Santos et al., 2016), in which the relationships proposed between the constructs are analyzed by way of four hypotheses. All of the coefficients in the structural model, estimated by maximum likelihood or by the asymptotic distribution-free method, were positive and significant, even when compared with groups by gender or country, which allowed the four hypotheses of the model to be accepted, including the effect of the financial education that parents pass on to their children to increase self-confidence

in managing money, which is not supported by the results obtained by Braun Santos et al. (2016).

Evidence is found that the impact of the financial education that parents pass on to their children is greater for sons than for daughters. This effect may be seen as women's greater dependence on parental attitudes, because they are more willing to talk to their parents about financial matters (Edwards et al., 2007). Additionally, this result may be explained by cultural differences in which parental expectations may play a relevant role as different practices are adopted with regard to sons or daughters (Newcomb & Rabow, 1999).

Also of note is the relationship between financial social comparison and regret related to credit card use. Few studies to date have examined the implications of financial social comparison among college students. This relationship is an important one because college students who find themselves admiring the possessions of others may spend more money to acquire similar things than they anticipate, only to regret that use later. It is possible that interventions could target financial social comparison to help reduce later debt and regret. Clearly, further study is required in this area.

The results obtained for the mediation effects suggest possible lessons about credit cards use by young adults. Two mediating effects can be highlighted, especially financial self-confidence and use of credit cards. First, self-confidence (*FSC*) mediates the effect of education received from parents (*PFES*) on regret related to credit card use (*CCUS*). Previous studies (Norvilitis & MacLean, 2010) discuss the possibility of existence of mediators on the effect of parental education, but did not present empirical evidence. In the present study, evidence is offered in this regard, such that the education received from parents impacts the use of credit cards, but only through a mediating effect of financial self-confidence. Second, the mediating effect of regret related to credit card use (*CCUS*) on financial well-being related to concern about debt (*FWB*) is important given that credit cards facilitate spending behavior, perhaps due a belief that well-being will improve with more spending and more possessions (Feinberg, 1986).

The data in the present study show that the opposite is also possible: credit cards pose risks to college students, because credit cards are also a means to very quickly create conditions for financial crises, especially in markets characterized by high interest rates and low levels of financial literacy. For example, in Brazil, a credit card debt of US$ 1,000.00 can be valued at approximately US$ 3,895.98 after 12 months, $15,178.63 after 2 years, and $59,135.57 after 3 years. In addition, more than 70% of college students do not know their interest rates (Mendes-Da-Silva et al., 2012). In this sense, regret related to credit card use seems to play the role of a bridge between envy (*FINSOC*) or self-confidence (*FSC*) behaviors and concern about indebtedness.

Examining the role of parental education between cultures found that French students' financial self-confidence and conscientious use of credit cards are more influenced by parents than students in the other two countries. Brazilian students reported greater social comparison. In view of the fact that the feeling of financial envy is associated with compulsive purchasing behavior (Mowen, 2000; O'Guinn & Faber, 1989; Roberts, 2000), action for improving the financial well-being of Brazilians should take this into consideration. For example, financial education-oriented public policies might be more effective if they contained discussions about the consumption needs of certain goods and about the influence exercised by the marketing industry.

Some of the limitations inherent in this research are worth recording. One of the main limitations is the composition of the database, in spite of the fact that it constitutes a structure that enables a comparison between three different countries. The choice of countries and the number of respondents impose limits on generalizing about the results obtained. In addition, because the data were collected at a single moment in time, the economic specificities of the moment in each country may constitute relevant material for investigation, but this does not form part of the scope of this work. These issues and the findings and arguments presented in this research point to a field of research that is highly interesting and that has an explicit social impact potential.

Finally, it is worth noting that this study focused on problematic use of credit cards among college students. Most students are responsible with credit (Robb et al., 2012) and the proper use of credit can allow such students increased financial freedom (Campbell & Pugliese, 2021). Future research should examine predictors and correlates of positive credit use as well. Additional research should also examine these relationships in adults as well to see if similar patterns are present among those who are in the workforce. We try to perform a study by following a Most Different Systems Design (MDSD), to compare countries that do not share any common features apart from the outcome to be explained and the explanatory factors seen to be important for that outcome, i.e. credit card use. Yet, in this work, the criterion of Byrne et. al. (1989) was satisfied for the comparison between genders (female and male), but not for the comparison between countries. Yet, we do not perform detailed comparisons of the components of the structural model across the countries, according to assumptions detailed by Byerne et al. (1989). Future studies can compare cultural differences, according to Landman and Carvalho (2016).

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Data Availability Available at: Mendes-Da-Silva, Wesley; Norvilitis, Jill; Protin, M. PHILIPPE (2021), "Data to replicate "Parents Influence Responsible Credit Use in Young Adults: Empirical Evidence from the United States, France and Brazil", published in Journal of Family and Economic Issues in 2021. ", Mendeley Data, V1, doi: 10.17632/zzrhh6hrdr.1Mendes-Da-Silva, Wesley; Norvilitis, Jill ; Protin, M. PHILIPPE (2021), "Data to replicate "Parents Influence Responsible Credit Use in Young Adults: Empirical Evidence from the United States, France and Brazil", published in Journal of Family and Economic Issues in 2021.", Mendeley Data, V1, doi: 10.17632/zzrhh6hrdr.1 or <https://data.mendeley.com/datasets/zzrhh6hrdr/1https://data.mendeley.com/datasets/zzrhh6hrdr/1>.

Code Availability We use Stata to perform our analysis based on data we collected and share with this paper.

Declarations

Conflict of interest The authors declare that they have no conflict of ineterst.

Consent to Participate At the time of data collection we read a presentation of the questionnaire, and only volunteer subjects answered the set of questions.

Consent for Publication Data are anonymous.

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