The antecedents and consequences of financial literacy: a meta-analysis

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Abstract

Purpose – The purpose of this paper is to determine the antecedents and consequences of financial literacy by using meta-analytic techniques.

Design/methodology/approach – The authors conducted a meta-analysis of 44 valid studies, which generated a total of 690 observations (effect sizes).

Findings – The findings showed that the factors influencing financial literacy were as follows: educational level, financial attitude, financial knowledge, financial behaviour, gender, household income and investments. The consequences of financial literacy were the behaviour of incurring avoidable credit and checking fees, credit score, and the willingness to take investment risks. The authors also find some methodological, cultural, economic and theoretical moderations effects between financial literacy and antecedent/consequent constructs.

Research limitations/implications – This meta-analysis reviewed the relationships found worldwide in the literature on financial literacy. The authors also identified new avenues for future research. Some specific limitations, such as the non-use of qualitative studies, are registered.

Originality/value – This research tested the impact of the antecedents, consequences and moderators of financial literacy via a meta-analytical review. This meta-analysis contributes to the marketing and financial literature by offering a set of empirical generalisations about the direct and moderation effects investigated.

Keywords Antecedents, Meta-analysis, Financial literacy, Consequents and moderators

Paper type Research paper

Introduction

Financial literacy is understood as "the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being" (Hung *et al.*, 2009, p. 4). On the other hand, financial well-being is understood as "a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and is able to make choices that allow them to enjoy life" (Consumer Financial Protection Bureau, 2017, p. 6). It is expected that as consumers increase their financial literacy, they become more sensitive to saving and investment decisions (Lusardi and Mitchell, 2007) and probably more skilful to make daily financial choices (Lusardi and Tufano, 2008). Given the importance of this issue in people's lives, the conceptualization and measurement of the term "financial literacy" is one of the major concerns on the agenda of researchers in the financial and marketing context (Huston, 2010; Lusardi and Mitchell, 2014).

Over the last few decades, financial literacy has been interpreted and measured by researchers from different fields of knowledge (Braunstein and Welch, 2002; Gathergood, 2012; Fernandes *et al.*, 2014; Sivaramakrishnan *et al.*, 2017). These studies have analysed the term "financial literacy" according to different lines of thought: the effect of parents on the financial socialisation of their children (Van Campenhout, 2015), financial literacy on the

stock market (Sivaramakrishnan *et al.*, 2017), the effect of financial literacy on individuals' willingness to take investment risks (Krische, 2014), its impact on financial well-being (Brüggen *et al.*, 2017) and its impact on attitudes towards personal saving (Dholakia *et al.*, 2016), among others.

This diverse range of studies has demonstrated the need to employ clearer and more consistent criteria in the definition and measurement of financial literacy (Remund, 2010). The correct definition and measurement of financial literacy is fundamental when analysing its relationships with other constructs (Huston, 2010). Many studies have shown divergent results regarding the relationships generated by financial literacy. One example of this can be found in the relationship between financial literacy and occupation. It is possible to identify positive relationships (Silgoner *et al.*, 2015) and neutral relationships (Montagnoli *et al.*, 2017).

These incongruencies between studies can be assigned to different methodological approaches (Hedges and Olkin, 1985), cultural differences (Minkov, 2011) or economic influences (Zarantonello *et al.*, 2013) about the country in which the study samples were drawn. Such incongruences constitute barriers that avoid the possibility of reaching a more definitive conclusion about the financial literacy construct. Meta-analytic techniques are suitable for surpassing these barriers because of their ability to provide generalisable results (Fern and Monroe, 1996). Indeed, this methodological approach is recommended to overcome possible biases associated with previous research limitations (e.g. type of sample, methodological robustness) and allows for the estimation of accurate effect sizes for each analysed relationship (Lipsey and Wilson, 2001).

Examples applied in financial contexts illustrate the assurance of the meta-analytic approach (e.g. Nienaber *et al.*, 2014; Ladeira *et al.*, 2016). In these cases, the meta-analytic studies are used to produce a generalisable understanding of the phenomenon (Lipsey and Wilson, 2001) by the identification of the antecedents, consequences and moderators of the construct that are investigated and the integration of findings derived from these relationships (Lipsey and Wilson, 2001). In essence, the meta-analytic approach is important because it allows researchers to consolidate their understanding of a phenomenon (Green, 2005).

In this way, this paper proposes the accomplishment of a meta-analytic study with the objective of analysing the main relationships associated with the construct of financial literacy. The systematic review made to promote this meta-analysis identified the main antecedents and consequences of financial literacy. After this identification, we analysed the effect sizes of each direct relationship. In addition, a hierarchical linear meta-analysis (HiLMA) was performed on the relationship between educational and financial literacy, with the intention of reducing the heterogeneity of previous findings. For the moderating variables of the HiLMA, the study used: power distance, uncertainty avoidance, long-term perspective, indulgence, the human development index, consumer price inflation (annual %), recent crises and other categories measuring financial literacy.

At the end of this study, we intend to provide answers to three main questions:

(1) What are the antecedent and consequent effects of the financial literacy construct?

(2) What is the strength of the antecedent and consequence relationships in the financial literacy construct?

(3) What are the moderators affecting the relationship between education level and financial literacy?

We also hope that this meta-analysis will contribute to studies on financial literacy, since it provides a synthesis and generalisation of the findings from the primary articles (Fern and Monroe, 1996). In addition, we identified possible moderating variables based on an analysis

of the heterogeneity of the relationships and detected areas requiring further investigation (Hedges and Olkin, 1985). Thus, given the generalisable and more consistent nature of the meta-analysis, this study intends to help managers to implement more assertive actions (Hunter and Schmidt, 2004).

Conceptual framework

Financial literacy is an essential component in the achievement of economic well-being (Braunstein and Welch, 2002). Theoretically, much has been said about this construct. In practice, however, financial literacy has been difficult to conceptualise, measure and evaluate (Lusardi and Mitchell, 2011; Atkinson and Messy, 2012).

Financial literacy can be conceptualised as a measure in which the individual has an understanding of major financial concepts and applies them in the management of their personal finances (Huston, 2010; Remund, 2010). According to this definition, it is understood that financial literacy is financial understanding that supports short-term decision-making and sound, long-term financial planning, while enabling the individual to be mindful of life events and changing economic conditions (Remund, 2010; Lusardi and Mitchell, 2011).

Despite the importance of financial literacy, many countries have had difficulties in dealing with this issue (Lusardi and Mitchell, 2011). These difficulties concern the selection of priority focus areas in order to increase individuals' financial literacy (Atkinson and Messy, 2012).

This difficulty arises from the complexity of assessing how people are financially literate and the specific factors driving this literacy (Fernandes *et al.*, 2014). This is due to the fact that financial literacy encompasses a number of concepts and a set of antecedents, consequents and moderators.

After conducting a systematic literature review, we identified similar constructs with different names. In this case, we performed a content analysis to group similar definitions used as antecedents or consequents of financial literacy. We incorporated the constructs into our theoretical model if at least three relationships with financial literacy were found among the studies investigated (Hunter and Schmidt, 2004). Then, we assigned groups of constructs to similar dimensions. This procedure has typically been used in other meta-analyses (e.g. Palmatier *et al.*, 2006; Santini *et al.*, 2018). Figure 1 presents the conceptual framework.

In this framework, literacy reflects the ability to perform a range of tasks related to money, including saving and spending (Huston, 2010; Remund, 2010). Operationally, several instruments are available in the literature for the measurement of financial literacy (Huston, 2010; Remund, 2010; Knoll and Houts, 2012). These instruments have been used on a large scale and measure financial categories such as interest, inflation, the time value of money, investment, risk diversification, debt management and retirement savings.

These instruments assess financial literacy as a skill or behaviour enabling individuals to use financial knowledge and attitudes to manage their financial operations (Hung *et al.*, 2009; Fernandes *et al.*, 2014).

Antecedents of financial literacy

Financial literacy in this context is formed by a set of interrelated constructs associated with socio-economic characteristics and financial behaviours and attitudes (Hung *et al.*, 2009; Lusardi and Mitchell, 2011). In our framework, based on a systematic literature review, we defined seven antecedent constructs of financial literacy: educational level, financial attitude, financial knowledge, financial behaviour, gender, household income and investments. Table I presents the conceptual definition, expected relationships and operationalization of each of the antecedents of this framework.
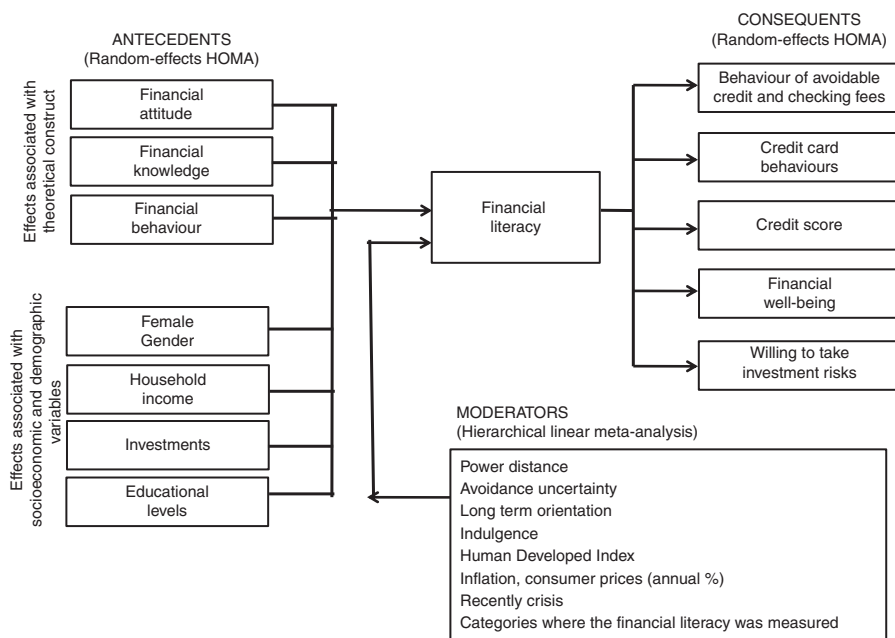
Figure 1.
Conceptual framework
for the meta-analysis

Consequents of financial literacy

Financial literacy results in behaviours that are capable of changing an individual's ability and confidence to apply this knowledge in financial decision making (Huston, 2010). This framework directly evaluated five possible consequences of financial literacy: the behaviour of incurring avoidable credit and checking fees, credit card behaviours, credit score, financial well-being and the willingness to take investment risks. Table II presents the operationalization of each consequent construct and the expected relationship with financial literacy.

Moderators of financial literacy

Financial literacy studies have demonstrated that financial competence is an essential element in more conscious and planned consumer decision making (Lusardi and Mitchell, 2011; Knoll and Houts, 2012). On the other hand, other studies have demonstrated that local characteristics, such as cultural and economic contexts, seem to coordinate their attitudes and consumption behaviours (Huston, 2010; Silgoner *et al.*, 2015).

Based on this statement, we analysed the moderators associated with the local characteristics in the relationships in the conceptual framework that presented the highest number of observations (educational level). It is important to analyse these groups, since cultural and economic elements are considered to be key factors in the understanding and distortions of behaviours found in the literature on financial literacy (Luttmer and Singhal, 2011). Similarly, cultural factors are responsible for enhancing or mitigating the effects of the two relationships (Fern and Monroe, 1996).

In addition, these moderators assist in our understanding of the relationship between educational level and financial literacy, as they offer explanations for the identified heterogeneity in this relationship. This is because the financial literacy studies consulted in this review analyse and incorporate studies with different sample sizes, collection techniques and application sites.

Conceptual definition	Expected relationship based on a bibliographic review	Common aliases	Relationship signal expectation
Antecedents of financial literacy			
Educational level refers to formal education, which can be understood as education obtained through schools regularly established in accordance with educational requirements (Silgoner *et al.*, 2015)	Research indicates that higher levels of schooling lead to higher levels of financial literacy (Chen and Volpe, 1998; Lusardi and Mitchell, 2011). This implies that those with less education are less likely to answer questions correctly and more likely to say that they do not know the answer (Chen and Volpe, 1998)	Years of education; college graduate	Positive
Financial attitude consists of a combination of concepts, information and emotions which are linked to the predisposition to act favourably in financial matters (Hogarth and Hilgert, 2002)	Attitude is understood as a psychological tendency which is expressed by evaluating a particular entity with some degree of favour or disfavour (Eagly and Chaiken, 1993). In the financial sphere, attitudes are established through the economic and non-economic beliefs possessed by a decision-maker (Ajzen, 1991). These financial attitudes tend to increase financial literacy (OECD, 2013)	Attitude; attitude to banking products; financial attitude	Positive
Financial knowledge is a type of human capital which is acquired through learning and affects individuals' ability to manage their income, expenses and savings effectively (Delavande *et al.*, 2008)	Financial literacy involves the ability to understand financial information and make effective decisions through financial education. This can occur through remembering a set of facts, i.e., financial knowledge (Robb *et al.*, 2012). Thus, knowledge about financial information tends to increase financial literacy (Lusardi and Mitchell, 2011)	Bank account knowledge; financial capability index; financial knowledge	Positive
Financial behaviour is manifested when people have a goal, purpose or motivation for saving (Henager and Mauldin, 2015)	The positive results of being financially literate are due to behaviour such as expenditure planning and the construction of financial security (Atkinson and Messy, 2012). Thus, financial literacy depends directly on good or bad financial behaviour (Marcolin and Abraham, 2006)	Desirable behaviour; financial behaviour	Positive
Household income refers to the respondents' family income level (Silgoner *et al.*, 2015)	People on lower incomes are more likely to have low levels of financial literacy (Hastings and Mitchell, 2011). Thus, the higher the income level, the greater the probability that the individual is part of a group with a higher level of financial literacy (Atkinson and Messy, 2012)	Income; household income; parental income	Positive

Table I.
Antecedents of
financial literacy

Conceptual definition	Expected relationship based on a bibliographic review	Common aliases	Relationship signal expectation
Female gender	Men's financial literacy is increasing faster than women's (Agarwal *et al.*, 2009). In addition, women generally have lower rates of financial literacy than men (Lusardi and Mitchell, 2011). Women find it more difficult to perform financial calculations and have a lower level of financial knowledge, which makes financial literacy difficult (Lusardi and Mitchell, 2011)	–	Negative
Investment variety refers to a mix of investments made by the respondents (securities, savings, stocks and mutual funds, among others) (Fernandes *et al.*, 2014; Chu *et al.*, 2017)	Financial literacy may be associated with the ability of consumers to be better shoppers. This provides them with more opportunities to consume, save or invest. Thus, making investments is associated with the specific aspects of personal finance which lead individuals to acquire more financial literacy (Remund, 2010). The greater the range of investments made, the greater the respondents' financial literacy	Participation; balance of financial assets; investment in bonds; stocks	Positive

Table I.

This meta-analysis then evaluated eight moderating variables, distributed into two main dimensions: cultural and economic. The cultural aspects comprise Hofstede (2011) dimensions: power distance, uncertainty avoidance, long-term perspective and indulgence level. In the economic dimensions, we analysed the human development index, inflation, consumer price inflation (annual %), recent crises and other categories measuring financial literacy. Table III describes the concept attributed to each of these moderators and the way they were coded.

Methodological design
As we mentioned earlier, we applied the meta-analytic approach to address some incongruencies in investigating financial literacy. In this way, we followed the steps indicated by Cooper *et al.* (2010), which have been reapplied in other meta-analytic studies (Ali *et al.*, 2015; Babić Rosário *et al.*, 2016). The Cooper (2010) approach comprises three steps: data search, data collection process, and data coding and analysis. It also contemplates the PRISMA protocol, which is recommended for systematic reviews (Moher *et al.*, 2009).

In the first step, a data search was performed. In this case, data were collected from seven databases: EBSCO, Elsevier Science Direct, Emerald, JSTOR, SciELO, Scopus and Taylor and Francis. In the second stage, namely, the data collection process, we used the search criterion of "financial literacy" in the title and summary areas of the database. In addition, we included any papers which cited the studies "Defining and measuring financial literacy" by Hung *et al.* (2009) and "Measuring financial literacy" by Huston (2010). Searching for these articles was important, since these studies generate scales to quantitatively measure the construct of financial literacy.

Conceptual definition	Expected relationship based on a bibliographic review	Common aliases	Relationship signal expectation
Consequents of financial literacy			
Behaviour of incurring avoidable credit and checking fees is understood as the frequency of fees paid by the consumer to the bank to use its financial services (Fornero and Monticone, 2011)	The effect of financial literacy reduces the behaviour of incurring avoidable credit and checking fees (Fernandes *et al.*, 2014). Thus, financial literacy tends to reduce the frequency with which the consumer pays fees to the bank	Bank interaction frequency	Negative
Credit card behaviours comprise five activities associated with consumer credit card use: (1) always paying a credit card balance in full; (2) carrying over a credit card balance and being charged interest; (3) making only a minimum payment on a credit card balance; (4) being charged a fee for late payment; and (5) being charged a fee for exceeding a credit limit (Allgood and Walstad, 2013)	Financial literacy is a financial behaviour which helps the consumer to avoid credit card purchases (Fernandes *et al.*, 2014). Thus, financial literacy tends to reduce the amount paid by the consumer on their credit card (Fornero and Monticone, 2011)	Credit card payment; credit card behaviour	Negative
Credit score refers to a numerical value derived from analysing a person's credit files (Mende and van Doorn, 2015)	Credit scores are crucial determinants of whether or not consumers should be given access to a variety of fundamental services, including mortgages, credit cards, car loans and/or insurance and utility services (Barakova *et al.*, 2003; Fellowes, 2006). This is because financial literacy has an influence on credit scores because it leads to higher scores, which in turn enables consumers to access better loans and jobs and to pay lower insurance premiums (Mende and Van Doorn, 2015)	Banks and credit card firms rate credit scores	Positive
Financial well-being is satisfaction with various aspects of a person's life associated with their financial situation (Prawitz *et al.*, 2006; Mende and van Doorn, 2015)	Financial literacy is known as a person's use of their knowledge and skills to generate financial well-being (Remund, 2010). This implies that having more knowledge about money can generate financial well-being (Braunstein and Welch, 2002)	Financial satisfaction	Positive
Willingness to take investment risks refers to the individual's willingness to take risks in general (Dohmen *et al.*, 2011; Almenberg and Dreber, 2015)	Financial literacy increases financial knowledge, thus leading to risk diversification (Krische, 2014). In addition, financial literacy tends to give the consumer a long-term perspective which has an impact on risk preferences (Lusardi and Mitchell, 2008)	Contributors to return loss; risk preference; risk investment; willing to take risk	Positive

Table II.
Consequents of
financial literacy

Variable/description	Codification
Cultural dimensions	
Power distance represents the degree of inequality between individuals in a society. It is a way of measuring the extent to which less powerful members in a society accept and expect the existence of this uneven distribution (Hofstede, 2011). In this case, we identified the index obtained in each country from which data were collected and separated them into two groups based on the median	0 = low power distance 1 = high power distance
Uncertainty avoidance represents a country's level of tolerance of uncertainties and ambiguities (De Mooij and Hofstede, 2011). This moderator reflects the level of discomfort which people feel regarding risks, chaos and unknown (Hofstede, 2011). In this case, we identified the indices obtained in each country from which data were collected and separated them into two groups based on the median	0 = low uncertainty avoidance 1 = high uncertainty avoidance
Long-term perspective is a measure which analyses whether a society maintains or adapts its traditions. This moderator is associated with the characteristic of resistance (or lack of resistance) to change. In the financial domain, this measure refers to the way in which savings and money are encouraged (Hofstede, 2011). For this, we identified the indices obtained in each country from which data were collected and separated them into two groups based on the median	0 = low long-term perspective 1 = high long-term perspective
Indulgence represents the extent to which individuals are able to control their desires and impulses. For this dimension, more indulgent cultures place higher value on freedom of expression and personal control (Hofstede, 2011). For this measure, we identified the indices obtained in each country from which data were collected and separated them into two groups based on the median	0 = low indulgence 1 = high indulgence
Economic dimensions	
The human development index was developed by the United Nations Development Programme and compares wealth, literacy, life expectancy and birth rate for each country. For this measure, we identified the indices obtained in each country from which data were collected and separated them into two groups based on the median	0 = low human development index 1 = high human development index
Consumer price inflation (annual %) is measured by the consumer price index and reflects the annual percentage change in the cost of acquiring goods and services for the average consumer, which may be fixed or changed at specified intervals (The World Bank, 2018). For this measure, we identified the indices obtained in each country from which data were collected and separated them into two groups based on the median	0 = low inflation 1 = high inflation
The recent crisis measure indicates whether the country under analysis in the article has experienced any kind of crisis during the data collection period	0 = no 1 = yes
Other categories related to financial literacy indicate possible objects of study in which financial literacy could be applied (Huston, 2010; Remund, 2010; Knoll and Houts, 2012)	0 = interest of inflation 1 = time value of money 2 = investment 3 = risk diversification 4 = debt management 5 = retirement savings

Table III.
Moderators associated
with the local
characteristics and
personal values of
the individual

Initially, 397 studies were identified. Soon after, we removed 141 studies, because they were characterised as qualitative studies. Another 41 studies were not investigated because the statistics they contained were insufficient to convert the effects into correlations. Another 171 studies were not analysed because they failed to include relationships of interest to this research. On the application of the above-mentioned criteria, we identified 44 valid studies, which generated a total of 690 observations (effect sizes).

In the last step, data coding and analysis, the coding process was carried out on a spreadsheet, which contained information such as: article identifier (number), work source

(paper, thesis), author(s), country of data collection, sample size, type of sample, type of collection, application context, study environment, consumption context, scale used, number of scale items, scale alpha index, index of extracted variance from the scale, related constructs (antecedent or consequent) between the relationships, and the conversion index of the correlation between the investigated behaviours.

The analysis procedures used Pearson's correlation coefficient (r). This coefficient infers the size of the effect found between financial literacy and a construct, antecedent or consequent. In studies in which a correlation index was not reported, we performed the conversion according to the procedures described by Hedges and Olkin (1985). The correlation value was calculated from the random effect, as suggested by Schmidt and Hunter (2014). In addition, the fail-safe number index was calculated in order to estimate the number of non-significant or unpublished studies that would be necessary to refute the findings of this study (Rosenthal, 1979). For this calculation, we used the formulae suggested by Rosenthal (1979) and Orwin (1983).

The direct effects analysed were elaborated through a random effects Hedges and Olkin meta-analysis to match the study estimates (Carney *et al.*, 2011). We used HiLMA to analyse the moderators in a multivariate regression-based format (Carney *et al.*, 2011). The HiLMA filters the effects of important moderators that may or may not be part of the primary studies. In our analysis, we only included variables employed in at least three regression models.

Analysis of the antecedents of financial literacy

Table IV presents the results of the antecedent constructs of financial literacy. The table shows: the number of studies which have investigated these relationships (k); the number of effects generated for the relationships between the constructs (0); the cumulative sample number of the studies tested (N); the force of the generated effect (r); the lower-limit confidence interval (LLCI); the upper-limit confidence interval (ULCI); the value of Fisher's Z transformation; the level of significance of the relationship (p-value); the level of relationship heterogeneity according to the Cochran Q index and the I^2 statistic; and the fail-safe number (FSN).

The results were significant and relevant across all types of antecedents, as demonstrated by the effect sizes of the variables in Table IV.

The expected relationship between educational level and financial literacy was confirmed ($r = 0.105$; $p < 0.05$). The values were consistent ($FSN_{Rosenthal} = 9,910$; $FSN_{Orwin} = 64$), indicating that individuals with higher levels of schooling tend to have higher levels of financial literacy. This is an acceptable result, because the higher the general education level of the individual, the greater the chance that they will adequately be able to answer financial questions (Chen and Volpe, 1998; Lusardi and Mitchell, 2007).

Financial attitudes were proven to have a great influence on financial literacy ($r = 0.13$; $p < 0.001$). It should be noted that financial literacy must be distinguished from financial attitudes (Edwards *et al.*, 2007). However, these concepts have been shown to be directly correlated. Financial attitudes are constructed through economic and non-economic beliefs, along with the ability to directly influence personal decision making and, consequently, increase financial literacy (OECD, 2013).

The expected relationship between financial knowledge and financial literacy was confirmed ($r = 0.31$; $p < 0.001$). This relationship proved to be consistent ($FSN_{Rosenthal} = 1,996$; $FSN_{Orwin} = 86$), which was confirmed by primary studies indicating that financial knowledge tends to increase self-confidence in financial decision making (Huston, 2010), thus leading to greater financial literacy (Lusardi and Mitchell, 2011).

Financial behaviour was shown to have a positive and significant relationship with financial literacy ($r = 0.333$; $p < 0.001$). These results were consistent

Variable	k	O	N	r	LLCI 95%	ULCI 95%	Z	p-value	Q	I^2	FSN*	FSN**
Antecedents												
1. Educational level	15	96	14,155	0.105	0.020	0.188	2.42	*	18,273.3	99.49	9,910	64
2. Financial attitude	10	20	25,800	0.130	0.019	0.237	2.31	**	365.55	95.89	597	33
3. Financial knowledge	8	15	3,522	0.310	0.103	0.490	2.89	**	839.95	98.33	1,996	86
4. Financial behaviour	11	45	8,148	0.333	0.241	0.419	6.75	**	3,305.7	98.66	23,061	241
5. Female gender	8	11	3,564	−0.280	−0.373	−0.183	−5.46	**	74.92	78.0	625	26
6. Household income	12	51	10,757	0.059	0.009	0.109	2.31	*	1,629.7	96.91	1,650	36
7. Investments variety	7	23	9,815	0.145	0.056	0.232	3.17	**	1,269.34	98.34	2,074	33
Consequents												
1. Behaviour of incurring avoidable credit and checking fees	5	38	28,646	−0.053	−0.066	−0.041	−8.19	**	1,147.7	96.77	20,147	49
2. Credit card behaviours	5	84	28,803	−0.004	−0.034	0.027	−0.235	ns	49,919.43	99.82	NC	NC
3. Credit score	4	9	1,565	0.311	0.214	0.402	6.05	**	72.19	88.91	666	42
4. Financial well-being	4	10	3,204	0.021	−0.033	0.074	0.758	ns	39.99	77.49	NC	NC
5. Willingness to take investment risks	3	13	880	0.569	0.428	0.682	6.71	**	8.06	87.59	8	5

Notes: FSN* shows Rosenthal's (1979) parameter; FSN** shows Orwin's (1983) parameter and NC shows not calculated. *$p < 0.05$; **$p < 0.001$

Table IV.
Antecedents and
consequents of
financial literacy

(FSN$_{Rosenthal}$ = 23,061; FSN$_{Orwin}$ = 241). Previous studies have also confirmed this relationship, because they indicate that financial behaviour is capable of increasing financial well-being, which, in turn, increases an individual's understanding of personal finance. Thus, this financial behaviour tends to increase financial literacy (Atkinson and Messy, 2012).

The gender and financial literacy relationship was negative and significant ($r = 0.280$; $p < 0.001$), indicating that women consumers are less financially literate and aware. This result was expected in light of the literature review, since male individuals are more likely to be included in groups with higher levels of financial literacy (Agarwal *et al.*, 2009; Lusardi and Mitchell, 2011).

The empirical evidence of this meta-analysis suggests that household income has a positive and significant relationship with financial literacy ($r = 0.059$; $p < 0.05$). These results demonstrate that low levels of income are associated with low levels of financial literacy (Hastings and Mitchell, 2011; Atkinson and Messy, 2012).

It is interesting to note that a willingness to make investments has a positive effect on financial literacy ($r = 0.145$; $p < 0.001$). This relationship is justified, since investments should be used as an operational variable. This variable goes beyond the capacity of financial awareness, as it evaluates a person's aptitude to manage specific aspects of their personal finances (Remund, 2010).

Analysis of the consequents of financial literacy
Table V presents the results of the consequents of financial literacy. Based on the results, we noted that the relationship between financial literacy and the behaviour of incurring avoidable credit and checking fees is negative ($r = -0.053$; $p < 0.001$). This result indicates that being more financially literate reduces the payment of avoidable credit and checking of fees (Fornero and Monticone, 2011). On the other hand, the relationship between financial literacy and credit card behaviours was not significant ($r = -0.034$; $p = $ ns), despite the fact that consumers make frequent or regular purchases of goods and services with their credit card, which is representative of financial behaviour. This relationship was not found to have any significant interaction in this meta-analysis.

The effect of financial literacy on credit scores was shown to be positive and significant ($r = 0.311$; $p < 0.001$). Although credit scores received little attention in the primary studies, this result proves that credit scores can be considered as one of the main indicators of consumers' objective financial well-being, which is generated through financial literacy.

In the primary studies, financial literacy was expected to promote increased financial well-being (Braunstein and Welch, 2002; Remund, 2010). This relationship was not confirmed by the calculations performed in this meta-analysis ($r = 0.021$; $p = $ ns). Finally, the relationship between financial literacy and the willingness to take investment risks was positive and significant ($r = 0.569$; $p < 0.001$). This finding indicates that financial literacy has an influence on a person's propensity to plan, as well as on their risk preferences (Fernandes *et al.*, 2014; Krische, 2014).

Moderators analysis
Analyses of possible moderators were carried out for the variables of educational level. The analysis took place under these conditions, since these relationships were significant, presented a significant number of observations ($k = 96$ and 84) and were highly heterogeneous ($Q = 18,273.3$ and $1,141.70$).

To test the moderation analysis, we used the HiLMA method, which comprises a multivariate format based on regressions to interpret moderating effects (Geyskens *et al.*, 2009). This procedure follows the recommendations of Lipsey and Wilson (2001). Table V

Moderators	Levels	Educational level		
		β^a	r^a	p-value
Power distance	Intercept	0.200		0.001
	Low	1	0.191	
	High	−0.106	0.087	0.05
Uncertainty avoidance	Intercept	0.200		0.001
	Low	1	0.191	
	High	−0.106	0.087	0.05
Long-term perspective	Intercept	0.113		ns
	Low	1	0.108	
	High	0.018	0.143	ns
Indulgence	Intercept	−0.123		0.05
	Low	1	−0.064	
	High	0.262	0.133	0.05
Human Development Index	Intercept	0.070		ns
	High	1	0.093	
	Low	−0.027	0.043	ns
Consumer price inflation (annual %)	Intercept	−0.022		ns
	Low	1	0.09	
	High	0.108	0.184	ns
Recent crises	Intercept	0.355		ns
	No	1	0.187	
	Yes	−0.176	0.048	ns
Other categories measuring financial	Intercept	0.047		ns
	Interest inflation	1	0.007	ns
	Time value of money	0.143	0.184	
	Investment	0.085	0.132	ns
	Risk diversification	0.093	0.136	ns
literacy	Debt management	−	−	−
	Retirement savings	−0.057	0.117	ns

Notes: β^a shows standardized coefficient; n shows accumulated sample size; r^a shows correlation coefficient; p-value shows the level of significance

presents the obtained results, divided into cultural and economic dimensions. We identified seven countries in which the relationship between education level and financial literacy was tested: Austria, Brazil, Germany, Japan, New Zealand, Scotland and the USA.

Cultural moderation effects
We tested four possible variables that could moderate the effect size of educational level and financial literacy: power distance, uncertainty avoidance, long-term perspective and indulgence.

The moderation test revealed three significant moderators: power distance, uncertainty avoidance and indulgence. The relationship between educational level and financial literacy was stronger in cultures with high power distance ($r_{high} = 0.191$; $r_{low} = 0.087$), cultures with low uncertainty avoidance ($r_{high} = 0.191$; $r_{low} = 0.087$) and cultures with high indulgence levels ($r_{high} = 0.133$; $r_{low} = -0.064$).

These results suggest that in societies characterised by higher power distance, low uncertainty avoidance and high indulgence levels, the gains in financial literacy derived from increases in educational levels are more pronounced, that is, the strength of the relationship between both constructs differs. Even though the Hofstede (2011) dimensions are country-level descriptors, whereas the relationship between formal education and financial literacy is measured at the individual level, further investigation into the mechanisms which help explain such results should be fostered.

Economic moderation effects

We analysed another four economic variables that could moderate the relationship between education level and financial literacy: human development index, consumer price inflation, recent crises and other categories measuring financial literacy. In this case, the analysis did not present significant results.

Conclusions

Programmes promoting financial literacy have been proposed to address the problem of over-indebtedness and to promote well-being. If, on the one hand, financial competence and socio-economic characteristics are essential elements of more conscious and planned consumer decision making, then on the other hand, individuals' cultural characteristics and personal values (power distance, uncertainty avoidance and indulgence), which are moderators in relationships pertaining to financial literacy, seem to coordinate their attitudes and consumption behaviours.

The availability of a large number of empirical studies on financial literacy has allowed us to more robustly establish the relationship between this construct and its antecedents and consequences. The identification of processes and mechanisms, which explain individual differences in relation to these constructs, would be a means by which to advance our understanding of the relationship between financial literacy and financial well-being. In this sense, the antecedents and consequences of financial literacy identified here could be incorporated into future studies in more detail. The antecedent constructs identified in this research refer to the socio-demographic characteristics (educational level, gender, household income and investments) and theoretical trainers of the financial literacy construct (financial attitude, financial knowledge and financial behaviour).

The financial literacy leads to certain financial behaviours (e.g. incurrence of avoidable credit and checking fees, credit card behaviours) and to an increased propensity for risk-taking to the detriment of other constructs (e.g. credit card repayment and engagement). So, these results reinforce of thinking the importance about the ways in which financial education programmes are offered.

This research has sought to arrive at a more consistent understanding of financial literacy and been conducted with the intention of integrating the findings of financial literacy research. For example, Fernandes *et al.* (2014) conducted a meta-analytic study to specifically look at the relationship between financial literacy, financial behaviour and financial education. Recently, Peeters *et al.* (2018) developed a systematic review to identify successful elements in financial literacy and the role of group counselling. Although the contribution of these works is widely acknowledged, further clarification is still needed in these fields since the work of Fernandes *et al.* (2014) did not include antecedent and consequent elements which differed from those for financial behaviour, while the study of Peeters *et al.* (2018) did not advance the generalised understanding of the phenomenon.

Managerial implications

From a managerial perspective, this study also offers contributions to practitioners and institutions interested in promoting financial well-being by means of financial education programmes. Financial literacy is commonly expected to promote increased financial well-being (Braunstein and Welch, 2002; Remund, 2010), but this relationship was not confirmed by the calculations performed in the current meta-analysis. The weak role of financial literacy in predicting financial well-being has important implications for financial education efforts. In accordance with Dholakia *et al.* (2016, p. 152), "simply teaching factual knowledge about how personal finance works as is done in conventional financial literacy programs may not be enough; it may be necessary to teach people habits that encourage consistent saving and ways to generate and maintain a saving-oriented lifestyle".

According to Fernandes *et al.* (2014), financial education initiatives focused on developing interpersonal skills may be more effective than those focused on content knowledge about interest rates and inflation. Personal characteristics such as gender, education, income and prior experience with varying investments should be considered in order to better delineate such intervention programmes.

Limitations and future research

Finally, the work does have some limitations, such as the non-use of qualitative studies and the adverse cut-off that exists in the secondary data. These limitations can be reduced with the application of research methodologies other than meta-analysis. We also considered papers measuring financial literacy in an objective way. Thus, in this case, we did not analyse studies measuring the financial literacy construct by means of subjective elements (e.g. confidence). Another important limitation refers to the fact that one of the problems with meta-analysis is the reduction in adverse concepts that exist in the used secondary data. Therefore, it should be pointed out that since these data are empirical and derived from different authors, there may be opposing conclusions. Therefore, some constructs (e.g. financial knowledge) could be measured in both objective and subjective ways. In this case, we cannot test using a separate format, because there are only a few studies available about this relationship. As such, other studies, with a higher number of relationships, could test a possible difference between these dimensions (objective and subjective).

Despite these limitations, we would like to highlight the contribution of this study to the field of financial literacy, in order to provide more assertive conclusions on the subject. This systematic review has enabled us to identify possible areas in need of further investigation, such as credit card behaviours and financial well-being. This paper can help managers to implement assertive public policies, since the results found here are conclusive based on the meta-analytic approach (Lipsey and Wilson, 2001; Green, 2005). In this sense, it is possible to imagine that actions carried out from the very beginning of children's educational trajectories, particularly directed at women from all income bands, will lead to more consistent results.

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