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How Does Parental Education Affect Consumer Financial Literacy? Evidence from the USA

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

This study explores the impact of parental education on consumer financial literacy, while simultaneously scrutinizing the mediating role of early financial education in this nexus. Leveraging the insights garnered from the 2021 National Financial Capability Survey, this inquiry employs the techniques of OLS and ordered probit regression to posit that parental education exerts a significant and positive influence on consumer financial literacy. Additionally, the investigation unveils that early financial education functions as a partial mediator in the linkage between parental education and the extent of consumer financial literacy. The findings indicate that early financial education can contribute to bridging the divide between parental financial literacy levels, thereby affording all children the opportunity to acquire financial knowledge and skills. This research underscores the importance of investing in early financial education as a pivotal means to augment financial literacy and foster broader financial inclusion.

Keywords: Parental education; financial literacy; early financial education; mediating effect.

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1. INTRODUCTION

Consumers face the daily task of making decisions that have profound implications on their financial stability and overall well-being. A profound level of financial awareness and comprehension is instrumental in guiding them towards more informed and beneficial financial choices [1]. Effective income management stands as a pivotal component in socioeconomic prosperity and is universally acknowledged as an indispensable proficiency for achieving personal and societal advancement [2]. Moreover, the paramount importance of financial literacy lies in its ability to cultivate sound financial decision-making capabilities and enhance overall financial prosperity [3]. Financial wellbeing is feeling financially secure, sufficiently free from worries, and satisfied with overall financial condition [4]. Extant research has underscored the pivotal significance of financial literacy in fostering a comprehensive and balanced financial inclusion throughout the economic landscape. This notion aligns with the premise that understanding financial concepts is crucial for ensuring inclusive and just financial access for all [5].

Notwithstanding the universally acknowledged significance of financial literacy, a considerable disparity in its levels is evident, as revealed by the 2019 National Survey on Financial Literacy and Inclusion (SNLIK) [6]. Individuals lacking sufficient financial literacy are often observed to demonstrate a diminished confidence in interpreting credit terms and display perplexity in grasping financial principles. Additionally, they tend to exhibit a reluctance in adopting behaviors that could potentially enhance their comprehension of the credit market [7]. And those who possess a profound comprehension of financial matters tend to exhibit a greater propensity for investing in risky financial assets, in contrast to those with a more superficial understanding of such matters [8]. Additionally, these differences are often closely linked to an individual's socioeconomic background, level of education, and cultural environment.

Accumulated evidence suggests that the acquisition of financial literacy is impacted by the process of financial socialization, an instrument where individuals attain financial knowledge and develop attitudes and habits, which in turn, influence their subsequent financial decision-making. Financial socialization is a process that can take place in various settings, including the home, school, and workplace. Nevertheless, research has demonstrated that the influence of the family stands out as the most significant factor in shaping financial socialization [9]. “The pivotal role played by parents in the intergenerational transmission of financial literacy bears profound societal and economic implications, highlighting the scope and significance of this process. Additionally, parental education is crucial for the quality relationship between parents and children, and it directly affects the child's progress and further life path” [10]. Thus, among the factors explored as influencing financial literacy, this paper employs parental education as the vital variable to see whether it significantly influences financial literacy. Although research indicates that a higher education is not a prerequisite for parents to exert a substantial influence on their children's consumer financial literacy [9]. Therefore, this study delved into the potential avenues through which parental education impacts financial literacy, specifically focusing on the intermediary function of early financial education. Existing evidence underscores the significant influence that early financial education can exert on individuals' financial literacy.

The educational level of parents, being a pivotal aspect of familial influence, holds the potential to significantly influence children's financial comprehension and literacy. Parents transmit their values, attitudes, and knowledge, including ideas about money, investment, and finance, to their children through the family environment, educational practices, and life models [11]. As an example, children often acquire their initial financial education through observational learning, even before they develop verbal abilities. They watch their parents engage in shopping activities and manage tangible household resources. This learning process unfolds naturally within the context of familial social interactions, regardless of whether parents consciously intend to impart such knowledge. Furthermore, young adults extensively utilize the knowledge and experiences acquired from their parents, which constitute a significant component of their familial socialization processes [12]. Extant research underscores that the linguistic proficiency of parents and their offspring, coupled with their distinct socialization backgrounds, has a noteworthy impact on the economic proficiency attained by young adults [13].

In our research, we leveraged the extensive dataset procured from the 2021 iteration of the National Financial Capability Survey (NFCS).

Within this framework, we designated parental education as the key predictor, while consumer financial literacy functioned as the resultant variable, thereby establishing a robust analytical structure. To guarantee the reliability of our findings, we incorporated a range of potential confounding factors, encompassing age, gender, ethics, marital status, and income. To estimate the influence of parental education on consumer financial literacy, we adopted both OLS and ordered probit regression methods. Income serves as a cornerstone in enabling parents to cultivate beneficial financial habits in their children, thereby potentially enhancing their financial literacy [14]. The robustness tests use the ordered logit regression model to exclude the effect of income heterogeneity.

Finally, this study will test the mediating effect of early financial education using an ordered probit model and expect a positive correlation coefficient. Through these analyses, this study expects to gain insights into the complex relationship between parental education level, early financial education, and consumers' financial literacy and to provide more effective policy recommendations and educational measures to improve personal financial management and help consumers better implement the financial decisions to achieve financial wellbeing successfully.

2. LITERACY REVIEW

2.1 Previous Study on Parental Education

Parental education has been widely recognized as a significant factor influencing children's development and wellbeing. Parents serve as important socializing agents, providing children with their first lessons through observational learning [14]. Even in their infancy, children acquire knowledge by observing their parents' handling of household resources and financial choices, prior to their ability to articulate words.

Consistent research has robustly illustrated the beneficial influence of parental education on the educational achievements of children. During childhood, parental financial education exhibits a substantial correlation with an enhanced likelihood of fostering beneficial financial practices during the progression into adulthood. [15]. Moreover, the importance of parental education is amplified as children progress through their education journey.

In addition to academic performance, the level of parental education holds significant importance in fostering children's financial comprehension and literacy. Parental financial education during childhood correlates significantly with an increased likelihood of developing positive financial habits during the transition to adulthood [16]. These behaviors are transmitted to children through observation and direct instruction, fostering a foundation for financial literacy.

The relationship quality between parents and children is another important factor influenced by parental education. Parents who possess higher education levels tend to establish more positive and encouraging relationships with their children. This constructive bond, in turn, contributes significantly to the comprehensive wellbeing and long-term life outcomes of their offspring [10].

Recognizing the vital role of parental education, it is imperative to strengthen parental competencies and provide accessible educational opportunities for parents. By addressing barriers to parenting education, parents can be empowered to fulfill their responsibilities effectively and positively impact their children's lives.

2.2 Previous Study on Financial Literacy

Recently, the significance of financial literacy has garnered increasing acknowledgement. By fortifying the market's demand-side, financial literacy equips individuals with greater confidence and knowledge in their interactions with industry stakeholders and engagement with financial offerings [17]. Consequently, there is a pressing need for more educational institutions to introduce financial literacy programs that acquaint youths with the fundamentals of investing and wealth accumulation [18].

More precisely, financial literacy, a concept with numerous dimensions, has been described in diverse manners throughout the literature, occasionally being used synonymously with terms such as financial proficiency, economic understanding, debt awareness, financial instruction, and financial comprehension [19-21]. Financial literacy is defined in a comprehensive manner, encompassing the understanding of financial concepts and self-confidence required to efficiently apply this knowledge across diverse financial contexts. The principal objective of financial literacy is to enhance both individual and societal financial well-being, fostering an active engagement in economic activities and pursuits [22]. Certainly, financial literacy stands as a pivotal skill that grants individuals the autonomy to make financially sound and educated decisions. This capability significantly enhances their ability to navigate complex financial landscapes with confidence and clarity, thereby contributing significantly to their overall financial health and well-being.

The ramifications of inadequate financial literacy extend to personal and official spheres, with improved financial literacy correlating positively with enhanced financial management. There is research that underscores the impact of financial literacy in practice. For example, it could increase civil servant cooperatives' performance, emphasizing its pivotal role in organizational effectiveness [23]. Similarly, the proficiency in financial literacy could favorably influence the competency and operational success of small to medium-sized textile enterprises [24]. Furthermore, proper financial literacy among business leaders leads to strategic financial decision-making, ensuring long-term viability and sustainability for their companies [25]. Moreover, the role of financial literacy extends to microfinance institutions (MFIs), where its impact on performance and sustainability is contingent on sound financial literacy practices and active engagement with rural communities [6]. While there is considerable focus on financial literacy within microfinance, particularly in Indonesia, there remains a dearth of studies specifically addressing this issue using a financial literacy index. It underscores the ongoing importance of exploring and understanding intricate financial literacy.

2.3 Previous Study on Parental Education and Consumer Financial Literacy

Parental education significantly influences consumer financial literacy, as evidenced by numerous studies. Parents transmit their values, attitudes, and knowledge, including ideas about money, investment, and finance, to their children through the family environment, educational practices, and life models [26]. In addition, parental involvement as crucial for enhancing financial literacy, stressing the importance of continual teaching and practicing financial tasks within the home environment [27]. Parents have a profound influence on a child's financial literacy, not only by imparting crucial financial intricacies but also by exemplifying and engaging in beneficial financial practices [28].

Children reared in households with parents of higher educational attainment tend to acquire more beneficial financial aptitudes and practices at an earlier stage in life, in comparison to those from homes with parents of lesser educational backgrounds [29]. In addition, parents with high incomes and superior educational backgrounds tend to engage more actively in financially educating their children, in contrast to those with lower incomes and educational attainment [30].

In summary, parental education and financial education constitute pivotal aspects of consumers' financial literacy. By imparting financial knowledge, essential competencies, and basic principles to their children, parents empower them with the necessary tools to attain long-term financial stability. Drawing from these premises, the present study advances the following hypotheses regarding the influence of parental education on consumer financial literacy.

Hypothesis 1(H_1): Considering the availability of economic resources and other pertinent variables as controls, parental education level exhibits a notable and favorable influence on consumer financial literacy.

Hypothesis 2 (H_2): Considering the availability of economic resources and other pertinent variables as controls, the effect of parental education level on consumer financial literacy is mediated by the implementation of early financial education.

The theoretical framework of this research is comprised of three principal elements: the explanatory variable, namely parental education; the response variable, consumer financial literacy; and the mediating variable, which is early financial education. Gender, age, race, whether being married, whether having dependent children, and family income were also considered as control variables.

In this study, the independent variable is designated as parental education, serving as the foundation for the inquiry and representing a potential incubator for financial literacy and proficiency within the familial context [31]. The mediating variable is early financial education, which facilitates early acquaintance with financial principles. This exposure assists students in cultivating beneficial financial practices from a tender age. Habits like consistent saving and making rational spending choices tend to endure into maturity [32]. Therefore, the level of early financial education emerges as a mediating factor, potentially influenced by the degree of parental education, which subsequently shapes the consumer financial literacy of children. Additionally, consumer financial literacy, which serves as the focal dependent variable, represents the ultimate objective of this study and encapsulates an individual's proficiency in both formulating and executing financial decisions. The measurement of this construct encompasses two distinct categories of variables: subjective understanding and objective comprehension. To guarantee the reliability of the study's outcomes and eliminate potential biases from variables such as gender, age, ethnicity, marital status, the presence of dependent children, and household income, they have been incorporated as control variables in our analysis of consumer financial literacy.

3. METHODS

3.1 Data

In this dissertation, the utilized sample data originated from the 2021 National Financial Capability Survey, a comprehensive national assessment aimed at evaluating the comprehension, perspectives, and practices of American adults pertaining to personal financial literacy and the economic landscape. The survey utilized a stratified multistage sampling methodology to draw 13,554 respondents from the U.S. adult population. The sample exhibited distinct representativeness in regard to a range of demographic characteristics, encompassing factors such as ethnicity, age, educational background, gender, and financial status.

The survey utilized the following three sampling procedures: first, stratified sampling, which divided the United States into geographic regions and randomly selected counties or districts within each region. Second is multistage sampling, in which household addresses are drawn from census blocks within each county or region by randomization methods. Lastly, there is random sampling, in which a respondent aged 18 years and above is drawn from the household members in each selected address through the randomization method. All respondents in the sample were above 18 years of age and the number of respondents reached a representative number of 13,554.

3.2 Model Specification and Variables

In this research, the dependent variable was consumer financial literacy, evaluated through two categories of variables: subjective knowledge and objective knowledge. Objective understanding was quantified via a 6-point scale that posed a specific question. Within the survey, five inquiries related to financial literacy encompassed interest rates, inflation, bond pricing, mortgages, and stocks. When a respondent provided an accurate answer, the variable was designated with a value of 1; otherwise, a value of 0 was assigned. An index of objective comprehension was further established by tallying the accurate responses, with the variable's value ranged from 0 to 6.

A separate set of variables focused on subjective knowledge, gauged through a 7-point Likert scale with the query, "How would you rate your comprehensive financial understanding on a scale of 1 (extremely low) to 7 (exceptionally high)?" Furthermore, the perceived financial proficiency was evaluated utilizing a 7-point scale, posing the question, to what degree do you align or dissent with the following assertion: 'I am adept at managing daily financial tasks, including bank account oversight, credit and debit card management, and expenditure tracking'?" Responses spanned a range from 1, indicating strong disagreement, to 7, representing strong agreement. Moreover, the receipt of financial education prior to graduation from college is regarded as a factor influencing early financial literacy (efedu).

This study primarily delves into the influence of parental education (pedu) on consumer financial literacy, specifically objective financial knowledge (fks) and subjective financial understanding (subfinkow). The fundamental regression model is defined as outlined below:

$$fks = \alpha_0 + \sum_{j=1}^{N} \beta_j * pedu_i + \sum_{k=1}^{M} \beta_k * cv_{k,i} + \varepsilon_i \quad (1)$$

$$subfinkow = \alpha_0 + \sum_{j=1}^{N} \beta_j * pedu_i + \sum_{k=1}^{M} \beta_k * cv_{k,i} + \varepsilon_i \quad (2)$$

In Equation (1), the subscript *i* signifies the sampled consumer, while the superscript *N* denotes the total count of variables pertaining to parental education. Furthermore, the superscript *M* denotes the count of control variables, and ε signifies the residual error term in the model. Moreover, the independent variable pertaining to parental education was operationalized using a 7-point Likert scale, inquiring about the highest educational attainment of the individual or individuals who nurtured the respondent.

Specifically, the scale ranged from 1, indicating "No completion of high school," to 2 for "High school graduate/GED," 3 for "Some college education without a degree," 4 for "Associate's degree," 5 for "Bachelor's degree," and ultimately 6 for "Postgraduate degree."

To elaborate further, the symbol cv_k represents the kth control variable. In this investigative endeavor, we have adhered to the precedent set by previous studies on consumer financial literacy by incorporating a range of demographic and socioeconomic factors as control variables. For example, previous research has revealed that young adults belonging to low-income households or identifying as minorities or females tend to exhibit less financial stability [33]. Consequently, to ensure rigor and precision, we incorporated various demographic and socioeconomic indicators as factors of control.

The study took into account various demographic variables, including gender, age (classified into six brackets: 18-24, 25-34, 35-44, 45-54, 55-64, and 65+), ethnicity (White versus Non-White), marital status (married or unmarried), dependency status (with or without dependent children), educational attainment (categorized as: High school graduate or below, Partial college education, Bachelor's degree, and Postgraduate or higher), and household income (stratified into three levels: 15,000−34,999, 35,000−74,999, and $75,000 or above).The control variables encompassed factors such as the possession of investments, a 401(k) account, a mortgage, an automobile loan, and a credit card. These variables were binary, with a value of 1 indicating the possession of the respective account and 0 indicating its absence. The inclusion of these account status variables was necessitated by the relevance of several behavioral variables in the study to these financial instruments. Additionally, perceived mathematical proficiency was incorporated as a control variable, measured on a 7-point scale, wherein a higher score indicates a stronger mathematical capability(mathcap). The pertinent information is presented in Table 1 for further reference.

Table 1. Variable specification

Variable	Attribute
Fks	The five questions pertaining to financial literacy encompassed inquiries on interest rates, inflationary trends, bond valuations, mortgage arrangements, and stock investments.
Subfinknow	To what degree do you endorse or oppose the following assertion?
Pedu	Could you indicate the highest level of education attained by the individual or individuals who raised you? Options include: 1 for not completing high school, 2 for high school graduation or GED equivalent, 3 for partial college education without a degree, 4 for an associate's degree, 5 for a bachelor's degree, and 6 for a post-graduate degree.
Efedu	1 = Received financial education before college graduation 0 = Received financial education after college graduation
Male	1 = Male, 0 = Female
Age	1=18-24 2=25-34 3=35-44 4=45-54 5=55-64 6=65+
Education	1=High school graduate or below 2=Some college, no degree; Associate's degree; Bachelor's degree 3=Postgraduate degree or above
Marriage status	1 = Being married, 0 = Not married
Mathcap	From 1 (Not at all good at math) to 7 (Extremely good at math)
White and non-Hispanic	1 = White, 0 = Non-white
Number of financially depended children	What is the number of children you financially support?
Annual income	1 = Less than $15,000; 2 = $15,000-$25,000; 3 = At least $25,000-$35,000； 4 = $35,000- $50,000; 5 = At least $50,000-$75,000; 6 = $75,000-$100,000; 7 = $100,000-$150,000; 8 = $150,000-$200,000; 9 = $200,000-$300,000; 10 = More than $300,000

Note: The contents are arranged by the authors.

3.3 Estimation Method

Drawing from the survey data, it is evident that the consumer financial literacy variable exhibits an ordered discrete character, ranging from 1 to 7. Given this distinct nature, the traditional OLS regression approach, when applied for estimation, may be prone to challenges in terms of robustness and precision. As a result, in this study, we initially utilize the OLS regression method and subsequently refine the estimated outcomes through the application of ordered probit regression.

$$\Pr(fks) = \phi(\beta_0 + \beta_1 * pedu + \beta_2 * cv_k + \varepsilon) \quad (3)$$

$$\Pr(subfinknow) = \phi(\beta_0 + \beta_1 * pedu + \beta_2 * cv_k + \varepsilon) \quad (4)$$

In the context of our empirical analysis, we employ the ordered probit regression model as a refinement tool to enhance the outcomes of the OLS regression. This approach is designed to derive a probability distribution function that aligns closely with the inherent characteristics of the dependent variable data, thus improving the accuracy of our empirical findings. By utilizing this model, we are able to ensure the precision of our results, which in turn strengthens the credibility of our research. Furthermore, the ordered probit regression serves as a valuable augmentation method to bolster the precision of our initial results, contributing to the overall rigor and quality of our analysis.

3.4 Statistical Description

In the present study, we categorize consumer financial literacy into two distinct yet complementary domains: Subjective comprehension of financial concepts and objective financial literacy. The subjective domine, as a psychological construct, encapsulates individuals' self-perceptions and evaluations of their overall financial knowledge and capabilities. This subjective variable serves as a crucial indicator of an individual's financial confidence and perceived competency in handling financial matters, thus reflecting their confidence and proficiency in managing financial matters.

In order to achieve a profound comprehension of consumers' subjective financial literacy, we conducted a rigorous survey and analyzed the gathered data in depth. The findings revealed that 9.22% of the respondents perceived their financial literacy knowledge to be inadequate, indicating a lack of confidence in their financial decision-making abilities. Conversely, a substantial proportion of 40.81% of the participants assessed their financial literacy as excellent, reflecting a high degree of self-assurance and perceived financial expertise.

These insights are significant in several respects. In the early stages of the investigation, they underscored the significance of integrating an individual's comprehension of financial literacy with their capacity to apply it practically, in addition to considering data-driven financial realities, to ensure the comprehensiveness and accuracy of our study. Secondly, subjective financial literacy, as a proxy for financial self-confidence, can influence individuals' financial behaviors and decisions. By understanding these subjective perceptions, we can devise more tailored interventions to empower consumers to make informed financial choices. Finally, the disparities in individuals' subjective grasp of financial literacy underscore the crucial need for targeted educational endeavors aimed at bridging the gaps in financial comprehension across diverse demographic groups.

The comprehensive summary of the descriptive data for this research is presented in Table 2. The total number of observations in the sample stands at 23871. With respect to the financial literacy score, serving as the dependent variable, the mean score was 3.291, the median was 3, and the dispersion was indicated by a standard deviation of 1.494. It indicates that most respondents had some basic understanding of financial concepts, but there was considerable variation. The respondents exhibited a significant level of confidence in their financial literacy, reflected by an average subjective financial knowledge score of 3.98 on a 5-point scale. Nonetheless, there was a substantial variance in this financial knowledge, evidenced by a standard deviation of 1.12. This observation highlights a disparity in financial literacy among participants, where some exhibit a profound understanding of financial concepts, while others show a comparatively limited grasp of these fundamentals. The findings suggest that a majority of participants possess a fundamental comprehension of financial principles and exhibit confidence in their capacity to seek financial guidance. However, noteworthy differences were evident in the diverse levels of financial awareness demonstrated among the study participants.

Upon analyzing the study's independent variables, a noteworthy finding emerges: the mean score for the educational attainment of respondents' parents stands at 3.490. Notably, the median score is 4, pointing towards a preponderance of parents with higher educational qualifications. Additionally, a standard deviation of 1.546 signifies considerable diversity within the dataset. This diversity implies that although most parents of the respondents have attained at least a high school diploma or beyond, there exists a broad spectrum of educational backgrounds. Such a breadth in parental educational backgrounds could potentially exert influence on their children's financial literacy and decision-making capabilities, thereby necessitating further scrutiny in subsequent research endeavors.

4. RESULTS AND DISCUSSION

The data for this study was gathered through the comprehensive state-level survey conducted by the NFCS in 2021, with the objective of evaluating the financial aptitude and comprehension levels of residents across all U.S. states. As such, respondents are primarily adults from each U.S. state who were selected to participate in this study to provide information on personal financial behaviors and knowledge. Furthermore, given that the focal independent variable in this research is the extent of parental education, the surveyed individuals exhibited a wide range of parental educational backgrounds. To undertake a thorough assessment of the impact of parental education on their offspring's financial understanding and capabilities, this study incorporates a range of education levels, from individuals without tertiary education to those holding advanced degrees.

Given that the NFCS serves as a cross-state survey tool, the survey respondents encompassed individuals residing in every state across the United States. The adoption of this methodology ensures the comprehensiveness and representativeness of the research findings, encapsulating the diverse financial understanding levels and the pervasive implementation of early financial education across various regions. In conclusion, the respondents to this dissertation are primarily adults from all U.S. states with diverse ages, genders, educational backgrounds, income levels, and geographic distributions. By thoroughly eliminating outlier income brackets that may potentially incorporating pertinent control variables fundamental to establishing causality, this study aims to provide a more accurate assessment of the influence parental education exert on consumers' financial literacy. Moreover, the study delves into the intervening role that early financial education assumes in molding individuals' financial acumen, acknowledging its pivotal significance as a potential bridge between parental guidance and financial proficiency. Through this approach, we aim to provide a comprehensive understanding of the multifaceted influences that shape consumer financial literacy.

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Fks	23,871	3.291	1.494	1	6
Subfinkow	23,871	5.131	1.295	1	7
Pedu	23,871	3.490	1.546	1	6
Efedu	23,871	0.194	0.396	0	1
Male	23,871	0.474	0.499	0	1
Age 18 to 24	23,871	0.100	0.300	0	1
Age 25 to 34	23,871	0.167	0.373	0	1
Age 35 to 44	23,871	0.168	0.373	0	1
Age 45 to 54	23,871	0.172	0.377	0	1
Age 55 to 64	23,871	0.180	0.385	0	1
Age above 65	23,871	0.213	0.410	0	1
High school or below	23,871	0.244	0.430	0	1
Some college to Bachelor's degree	23,871	0.638	0.481	0	1
Postgraduate degree or higher	23,871	0.118	0.323	0	1
Being married	23,871	0.509	0.500	0	1
Mathcap	23,871	5.516	1.610	1	7
White and non-Hispanic	23,871	0.753	0.431	0	1
Number of financially depended children	23,871	0.646	1.043	0	4
Annual income	23,871	4.627	2.179	1	10

Note: The results are arranged by the authors.

4.1 Results of Correlation Analysis

Table 3 provides a comprehensive overview of the intricate relationships existing among diverse variables, particularly emphasizing the interplay between the receipt of initial financial education, the sustained efforts towards financial education, and the ultimate level of financial literacy attained by consumers. This table serves as a crucial analytical tool in understanding the interconnected nature of these factors, thus aiding in the identification of patterns and trends that can be utilized in shaping effective financial education strategies.

The majority of correlations adhere to the anticipated patterns. The analysis reveals a positive association between various factors, including the educational attainment of parents, the education level of respondents, household financial resources, and degree of financial understanding. For example, both sets of dependent variables, encompassing objective and subjective financial literacy, demonstrate a positive correlation with all other variables. This signifies that as the values of the other variables rise, the value of objective financial literacy tends to increase accordingly. More precisely, a positive correlation has been established in the relationship between financial knowledge and individuals' perceived understanding of finances, resulting in a correlation coefficient of 0.230 with a statistical significance of 1%. The revelation highlights that individuals possessing a high degree of financial literacy are inclined to adopt a proactive stance towards their financial proficiency and proficiency in financial matters. Furthermore, a positive correlation has been observed between financial literacy and mathematical proficiency, exhibiting a correlation coefficient of 0.277. This signifies that individuals with superior mathematical skills are likely to exhibit a deeper comprehension of financial concepts.

Following a thorough examination, a clear and positive association emerges between parents' educational backgrounds and the financial comprehension of their children, encompassing both objective and subjective aspects. In a rigorous academic examination, the current analysis underscores a profound correlation between the educational attainment of parents and the financial literacy exhibited by their offspring. Specifically, the empirical findings indicate that individuals whose parents have attained higher levels of education consistently demonstrate a more sophisticated and comprehensive understanding of financial principles and practices. This observation underscores the significant role that educational attainment plays in promoting financial well-being across generations.

4.2 Parental Education and Consumer Financial Literacy

Table 4 summarizes the results of the regression analysis, revealing the linkage between the educational attainment of parents and the extent of financial comprehension displayed by their children. The depiction of financial comprehension presented in Column (1) is gauged by means of objective financial proficiency indicators. Column (2) reflects the consumers' self-reported financial literacy scale. To assess how parental education influences the development of consumer financial literacy, we have included the pertinent variables related to parental education in Columns (3) and (4), thereby enabling a comparative assessment of their significance.

Across all four models, a positive association is observed between the extent of parental education and the proficiency in consumer financial literacy, suggesting that individuals whose parents possess higher educational attainment are likely to possess superior financial literacy skills. Upon considering the effects of other contributing variables, every additional level of parental education is associated with an average augmentation of 0.05 points in the objective financial literacy index, as well as an increase of 0.022 units in the perceived financial literacy scale.

In Columns (1) and (2), the majority of control variables exhibited statistical significance. Notably, the coefficients for gender consistently emerged as positive and significant, echoing previous research findings. When comparing male and female consumers, it is observed that males tend to possess greater levels of financial literacy. An analysis of financial understanding indicates that elderly individuals demonstrate a superior level of fiscal comprehension in comparison to their younger peers. Moreover, research indicates that consumers in marital unions display higher degrees of financial understanding compared to those who are unmarried, evidenced by notably positive correlation indices. When assessing mathematical abilities, those with superior mathematical skills are likely to possess higher financial literacy levels than those with lesser skills. Additionally, in regards to racial and ethnic demographics, individuals from Caucasian and non-Hispanic backgrounds tend to exhibit greater proficiency in financial matters compared to other ethnic groups. As households expand in size, a significant negative association emerges with financial literacy. Simultaneously, consumers who enjoy a higher and more consistent income level tend to exhibit a greater degree of financial literacy.

The findings in Columns (3) and (4) reinforce the argument that parental education level exerts a notable and positive influence on consumers' financial literacy. Furthermore, these results quantify the impact, revealing that for every incremental unit in parental education, there is an average increase of 0.05 units in the objective financial literacy score and 0.022 units in the subjective score. The significance of recognizing the crucial contribution of parental education to the enhancement of financial literacy cannot be overstated.

Utilizing the ordered probit regression method, Table 5 demonstrates the effects of parental education levels on individuals' consumer financial literacy. Additionally, the set of the variables of this model is the same as the regression results. Comprehending the critical significance of parental education in fostering financial literacy is imperative. Furthermore, the impacts of the control variable on consumer financial literacy align with the outcomes of the regression analysis. However, compared to the OLS estimates, the ordered probit estimates are more appropriate for situations where the dependent variable is an ordered categorical variable, such as financial literacy. The ordered probit model takes into account the ordered nature of the dependent variable and provides more accurate estimates.

4.3 Endogeneity and Robustness Check

This research acknowledges the potential for endogeneity concerns in the aforementioned regression model, given that the coefficients may not definitively establish a causal link between parental education and consumer financial understanding. In this study, we employ a range of instrumental variables along with ordinal probability estimation methods to alleviate the potential impact of endogeneity on the accuracy of our estimated findings.

The utilization of instrumental variables to enhance the ordered probit model is further detailed in Columns (3) and (4) of Table 5. Our examination of the estimation outcomes reveals that the coefficient of the parental education instrument holds a positive value and is statistically significant. Notably, the signs associated with the remaining variables maintain a significant level of consistency. Furthermore, we observe that the coefficient of parental education in Columns (1) and (2) is higher than that in Columns (3) and (4). This difference suggests the existence of an endogeneity problem. By incorporating instrumental variables, we are able to reduce the influence of endogeneity, resulting in more accurate estimation outcomes.

To assess the robustness of our estimations, this study initially replaced the OLS regression estimation method with the ordered logit regression as an alternative approach. Secondly, consistent with prior research, parents who possess a higher income tend to be more proactive and assured in imparting financial knowledge to their children.[34]. Income level can significantly influence consumers' financial literacy, as individuals with higher incomes tend to possess greater resources and educational access, thereby enhancing their comprehension of financial matters. Conversely, those with lower incomes may not have access to adequate education and training due to resource constraints, resulting in lower levels of financial literacy. Consequently, the potential endogeneity associated with parental education necessitates cautious consideration. And it is advisable to exclude the two income brackets at the extremes, as this aids in isolating the specific effects of parental education. By excluding this factor, we mitigate the impact of income disparities on our findings, enabling a more accurate assessment of the correlation between parental education and financial literacy among consumers. By removing the extreme income brackets, researchers can gain a clearer understanding of how parental education levels contribute to financial knowledge and capabilities in individuals. This approach allows for a focused and nuanced investigation into the factors that shape financial literacy, highlighting the importance of parental educational background in this context. To mitigate the potential influence of income outliers, this study retained samples with incomes ranging from 15,000 to 30,000, ensuring the inclusion of relevant and representative data points. The findings of the robustness analysis are presented in Table 6.

In the analyses presented in Columns (1) and (2), the coefficient pertaining to parental education displays a statistically significant positive association. Similarly, in Columns (3) and (4), the coefficients pertaining to parental education maintain their significant positive trend across all specifications. Referring to the robust findings presented in Table 6, a consistent and noteworthy association is observed between parental education and consumer financial literacy. Specifically, sustainable parental education significantly and favorably contributes to enhancing consumer financial literacy.

4.4 Mediating Effect

Consumer financial education encompasses the foundational financial knowledge imparted to consumers through educational institutions such as high schools, universities, and in the workplace [35]. As the former studies used the participants before 24 as the variable to observe the effects of parental education, therefore, this study employs the respondents when they received the financial education before college graduation as the early financial education. A comprehensive examination of undergraduate students at an Australian institution of higher education revealed that financial education had a favorable effect on both objective and subjective financial literacy, resulting in an enhancement of individuals' financial decision-making capabilities [36]. Through early financial education, parents can teach their children basic concepts and skills about finance, and examples include savings practices, budgetary administration, and financial management abilities.

Table 3. Correlations between parental education and consumer financial literacy

Variables	Fks	Subfinkow	Pedu	Efedu	Mathcap	Annual income
Fks	1.000					
Subfinkow	0.230***	1.000				
Pedu	0.175***	0.113***	1.000			
Efedu	0.111***	0.158***	0.092***	1.000		
Mathematical capability	0.277***	0.419***	0.100***	0.104***	1.000	
Annual income	0.317***	0.272***	0.279***	0.066***	0.200***	1.000

Table 4. Results of regressions of parental education on consumer financial literacy

Variables	(1)	(2)	(3)	(4)
	Fks	Subfinkow	Fks	Subfinkow
Pedu			0.050***	0.022***
			(0.007)	(0.006)
Male	0.523***	0.164***	0.517***	0.161***
	(0.017)	(0.015)	(0.017)	(0.015)
Age 18 to 24	-0.824***	-0.367***	-0.858***	-0.382***
	(0.034)	(0.030)	(0.035)	(0.031)
Age 25 to 34	-0.770***	-0.323***	-0.800***	-0.335***
	(0.029)	(0.026)	(0.029)	(0.026)
Age 35 to 44	-0.722***	-0.352***	-0.747***	-0.363***
	(0.029)	(0.026)	(0.029)	(0.026)
Age 45 to 54	-0.364***	-0.339***	-0.378***	-0.345***
	(0.028)	(0.025)	(0.028)	(0.025)
Age 55 to 64	-0.192***	-0.211***	-0.200***	-0.214***
	(0.027)	(0.024)	(0.027)	(0.024)
Some college to	0.441***	0.062***	0.369***	0.031
Bachelor's degree	(0.021)	(0.018)	(0.023)	(0.020)
Postgraduate degree	0.649***	0.172***	0.520***	0.116***
or higher	(0.032)	(0.029)	(0.036)	(0.032)
Being married	-0.006	0.109***	0.002	0.112***
	(0.020)	(0.018)	(0.020)	(0.018)
Mathcap	0.146***	0.287***	0.145***	0.286***
	(0.005)	(0.005)	(0.005)	(0.005)
White and non-	0.164***	-0.035*	0.158***	-0.038**
Hispanic	(0.021)	(0.019)	(0.021)	(0.019)
Number of financially	-0.083***	0.038***	-0.083***	0.038***
depended children	(0.009)	(0.008)	(0.009)	(0.008)

Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Fks	**Subfinkow**	**Fks**	**Subfinkow**
Annual income	0.124***	0.088***	0.120***	0.087***
	(0.005)	(0.004)	(0.005)	(0.004)
Constant	1.586***	3.409***	1.516***	3.378***
	(0.075)	(0.066)	(0.075)	(0.067)
State dummies	Yes	Yes	Yes	Yes
Observations	23871	23871	23871	23871
Adjusted R^2	0.262	0.230	0.263	0.231

*Notes: Standard errors are in parentheses. In addition, *, **, *** indicate the significant level of 10%, 5%, and 1%, repectively.*

Table 5. Results of regressions of parental education on consumer financial literacy

	(1)	**(2)**	**(3)**	**(4)**
	Fks	**Subfinkow**	**Fks**	**Subfinkow**
Pedu			0.040***	0.021***
			(0.005)	(0.005)
Male	0.418***	0.166***	0.413***	0.163***
	(0.014)	(0.014)	(0.014)	(0.014)
Age 18 to 24	-0.660***	-0.346***	-0.689***	-0.360***
	(0.028)	(0.028)	(0.028)	(0.028)
Age 25 to 34	-0.612***	-0.296***	-0.636***	-0.309***
	(0.024)	(0.024)	(0.024)	(0.024)
Age 35 to 44	-0.574***	-0.318***	-0.595***	-0.329***
	(0.024)	(0.024)	(0.024)	(0.024)
Age 45 to 54	-0.290***	-0.313***	-0.302***	-0.319***
	(0.023)	(0.023)	(0.023)	(0.023)
Age 55 to 64	-0.151***	-0.196***	-0.157***	-0.199***
	(0.022)	(0.022)	(0.022)	(0.022)
Some college to Bachelor's degree	0.356***	0.043**	0.299***	0.013
	(0.017)	(0.017)	(0.019)	(0.019)
Postgraduate degree or higher	0.525***	0.165***	0.422***	0.112***
	(0.026)	(0.027)	(0.030)	(0.030)
Being married	-0.005	0.095***	0.001	0.099***
	(0.016)	(0.016)	(0.016)	(0.016)
Mathcap	0.120***	0.258***	0.120***	0.257***
	(0.004)	(0.005)	(0.004)	(0.005)
White and non-Hispanic	0.132***	-0.030*	0.128***	-0.033*
	(0.017)	(0.017)	(0.017)	(0.017)
Number of financially depended children	-0.067***	0.040***	-0.067***	0.040***
	(0.007)	(0.007)	(0.007)	(0.007)
Annual income	0.100***	0.079***	0.097***	0.077***
	(0.004)	(0.004)	(0.004)	(0.004)
State dummies	Yes	Yes	Yes	Yes
Observations	23871	23871	23871	23871
Pseudo R^2	0.086	0.080	0.087	0.080

*Notes: Standard errors are in parentheses. In addition, *, **, *** indicate the significant level of 10%, 5%, and 1%, repectively.*

Table 6. Robustness check

Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Fks	**Subfinkow**	**Fks**	**Subfinkow**
Pedu	0.071***	0.039***	0.032***	0.022***
	(0.009)	(0.009)	(0.006)	(0.006)
Male	0.726***	0.283***	0.424***	0.178***
	(0.024)	(0.024)	(0.015)	(0.015)
Age 18 to 24	-1.191***	-0.661***	-0.739***	-0.332***
	(0.049)	(0.049)	(0.032)	(0.031)
Age 25 to 34	-1.093***	-0.567***	-0.645***	-0.321***
	(0.041)	(0.041)	(0.025)	(0.025)
Age 35 to 44	-1.019***	-0.585***	-0.614***	-0.329***
	(0.042)	(0.042)	(0.025)	(0.026)

Variables	(1)	(2)	(3)	(4)
	Fks	Subfinkow	Fks	Subfinkow
Age 45 to 54	-0.514***	-0.554***	-0.306***	-0.321***
	(0.039)	(0.039)	(0.024)	(0.024)
Age 55 to 64	-0.273***	-0.341***	-0.166***	-0.200***
	(0.037)	(0.037)	(0.023)	(0.023)
Some college to	0.504***	0.017	0.316***	0.020
Bachelor's degree	(0.032)	(0.033)	(0.020)	(0.020)
Postgraduate degree or	0.736***	0.169***	0.435***	0.122***
higher	(0.051)	(0.051)	(0.031)	(0.031)
Being married	0.003	0.160***	-0.012	0.106***
	(0.028)	(0.028)	(0.017)	(0.017)
Mathcap	0.201***	0.479***	0.124***	0.263***
	(0.008)	(0.008)	(0.005)	(0.005)
White and non-Hispanic	0.234***	-0.065**	0.113***	-0.028
	(0.030)	(0.030)	(0.019)	(0.019)
Number of financially	-0.107***	0.069***	-0.068***	0.035***
depended children	(0.013)	(0.013)	(0.008)	(0.008)
Annual income	0.166***	0.135***	0.103***	0.072***
	(0.007)	(0.007)	(0.005)	(0.005)
State dummies	Yes	Yes	Yes	Yes
Observations	23871	23871	21107	21107
Pseudo R^2	0.087	0.083	0.081	0.076

*Notes: Standard errors are in parentheses. In addition, *, **, *** indicate the significant level of 10%, 5%, and 1%, repectively.*

Table 7. The mediating effects of early financial education

Variables	(1)	(2)	(3)
	Efedu	Fks	Subfinkow
Efedu		0.197***	0.357***
		(0.017)	(0.018)
Pedu	0.025***	0.039***	0.018***
	(0.007)	(0.005)	(0.005)
Male	0.120***	0.408***	0.154***
	(0.020)	(0.014)	(0.014)
Age 18 to 24	0.587***	-0.722***	-0.420***
	(0.038)	(0.029)	(0.028)
Age 25 to 34	0.167***	-0.646***	-0.326***
	(0.034)	(0.024)	(0.024)
Age 35 to 44	0.031	-0.598***	-0.335***
	(0.035)	(0.024)	(0.024)
Age 45 to 54	0.135***	-0.309***	-0.334***
	(0.033)	(0.023)	(0.023)
Age 55 to 64	0.131***	-0.164***	-0.214***
	(0.031)	(0.022)	(0.022)
Some college to Bachelor's	0.374***	0.283***	-0.017
degree	(0.028)	(0.019)	(0.019)
Postgraduate degree or higher	0.436***	0.403***	0.078***
	(0.042)	(0.030)	(0.030)
Being married	0.045*	-0.002	0.096***
	(0.023)	(0.016)	(0.016)
Mathcap	0.090***	0.116***	0.252***
	(0.007)	(0.004)	(0.005)
White and non-Hispanic	-0.061**	0.131***	-0.027
	(0.024)	(0.017)	(0.017)
Number of financially	0.017	-0.068***	0.038***
depended children	(0.010)	(0.007)	(0.007)
Annual income	0.013**	0.096***	0.077***
	(0.005)	(0.004)	(0.004)
State dummies	Yes	Yes	Yes
Observations	23871	23871	23871
Pseudo R^2	0.045	0.088	0.085

*Notes: Standard errors are in parentheses. In addition, *, **, *** indicate the significant level of 10%, 5%, and 1%, repectively.*

By using early financial education as a mediating variable, it can better understand how parenting influences a child's consumer financial literacy in adulthood by affecting their early financial education. An exploration of this intermediary relationship can provide insights into the underlying mechanism of how early financial education is transmitted from parental education to consumer financial literacy, thereby assisting policymakers and practitioners in enhancing the overall financial literacy standards.

Consequently, early financial education (EFEDU) is selected as a mediating factor to delve into the intervening effect between parental education and consumers' financial literacy.

$$\Pr(edfu) = \phi(\beta_0 + \beta_1 * pedu + \beta_2 * cv_k + \varepsilon) \quad (5)$$

In all three models, it is evident that early financial education displays a positive relationship with consumer financial literacy, indicating that individuals who undergo such educational programs are prone to exhibiting a superior level of financial understanding and literacy. Specifically, those with early financial education achieve an average of 0.197 units higher in objective financial literacy scores and 0.357 units higher in subjective financial literacy scores. The outcomes of this study reveal that early exposure to financial education serves as a partial moderator in the connection between parents' educational attainment and the financial understanding of consumers.

Furthermore, the significance of early financial education and parental guidance on consumer financial literacy is profound, encompassing both the quantitative and qualitative aspects of this comprehension. These two educational factors not only contribute independently but also intersect in a manner that significantly enhances individuals' financial understanding and self-perception. Notably, early financial education emerges as a pivotal mediator in the process, effectively channeling the influence of parental education towards fostering improved consumer financial literacy. Specifically, by initiating financial concepts and practices at a young age, early financial education lays the foundation for a child's financial comprehension, which is then further strengthened by the guidance and influence of their parents' educational background and financial experiences. This combined effect results in a more comprehensive and robust financial literacy, beneficial to individuals throughout their lives.

5. CONCLUSIONS AND IMPLICATIONS

In the current research, we have conducted a thorough examination of the intricate interplay between parental education and consumer financial literacy, paying particular attention to the critical mediating function of early financial education. To accomplish this goal, we have harnessed the extensive dataset stemming from the 2021 National Family Financial Capability Study's state-wide survey, offering a comprehensive insight into the financial behaviors and aptitudes displayed by households throughout the country. Through a thorough and rigorous examination of the available data, we have uncovered compelling indications that parental education plays a pivotal and constructive role in shaping financial literacy. This finding is of paramount importance in understanding the multifaceted factors that shape individuals' financial comprehension and capabilities, ultimately contributing to their overall financial well-being.

Furthermore, our comprehensive analysis highlights the crucial significance of early financial education as a mediating factor in the intricate relationship between parental education and consumers' financial literacy, thereby further enhancing the association between these two variables. Consistent findings from our research demonstrate that individuals whose parents have attained a higher educational level tend to demonstrate superior levels of financial literacy, thereby validating our initial hypothesis (H_1). The reason behind this correlation could stem from the likelihood that parents with higher education levels possess financial knowledge and skills that they are able to impart to their children. Furthermore, these parents tend to reside in environments that foster the development of financial literacy, such as those that offer greater accessibility to financial information and opportunities.

The present study further reveals that early financial education serves as a partial intermediary between parental education and consumers' financial literacy, aligning with the proposed hypothesis (H_2). This indicates that early financial education serves as a bridge between varying levels of parental financial literacy, thereby affording all children with the opportunity to acquire essential financial knowledge and skills. It holds significant importance for children whose parents are less financially literate, as they may not receive adequate financial guidance from their parents. To guarantee the reliability and validity of the findings, the study uses a variety of econometric methods, including the OLS, ordered probit, and ordered logit regression models. The study also tests the effect of income heterogeneity by excluding the two highest and lowest income groups. The robust assessments validate the consistent positive correlation between parents' educational attainment and consumers' financial comprehension, spanning diverse modeling approaches and sample populations.

The results of this inquiry hold profound implications for both policymakers and educators. Initially, the investigation underscores the pivotal role that parental education plays in fostering children's financial acumen. Therefore, policies should foster the financial literacy of all parents and emphasize the need to work on strengthening parental competencies.

Second, the research highlights the potential of early financial education to promote financial inclusion and improve overall financial health. Policymakers should invest in early financial education programs that provide opportunities for all children to gain financial knowledge and skills. For example, policymakers should develop early financial education programs that can be integrated into school curricula or offered by community-based organizations and non-profits. It is especially important for children whose parents are less financially literate.

Previous research has highlighted a scarcity of understanding Concerning the interpersonal facets of adolescent financial autonomy and its progression towards adulthood. Our study reveals that parents occupy a pivotal position as both immediate educators and influential role models in fostering their children's financial progress. Through the phases of adolescent growth and the transition into adulthood, parents' consistent execution of these dual responsibilities lays a robust foundation for young adults to cultivate robust financial perspectives and habits. Acknowledging the pivotal role of financial well-being in diverse indices of college achievement, parental investments aimed at fostering financial proficiency and comprehension among youths are likely to yield considerable dividends, encompassing enhanced health, resilience, and scholastic achievements among adolescents. Furthermore, research into financial literacy can serve as a valuable tool in identifying the evolution and refinement of its fundamental principles. Since financial literacy is a crucial aspect of achieving successful adulthood, these essential skills need to be consistently imparted and practiced within the home environment by parents and the entire family unit. This familial setting offers the most effective platform for modeling, instructing, and reinforcing financial knowledge and practices.

Moreover, research findings suggest that income gaps are associated with financial literacy gaps. Extensive studies have shown that parents with higher incomes tend to engage more actively in financial activities. As a result, it profoundly shapes the financial awareness and skills of young adults. Therefore, policymakers should develop targeted interventions for low-income families to reduce financial literacy gaps. Interventions may comprise financial education courses tailored for low-income parents, as well as introductory financial education programs for economically disadvantaged children and adolescents. Additionally, policymakers ought to embark on initiatives aimed at enhancing public recognition of the cruciality of financial literacy. These campaigns could focus on helping people understand financial concepts and tools and providing information on how to access financial education resources.

The current study, though comprehensive in its scope, is nonetheless constrained in several aspects. A significant limitation of the current study lies in its narrow scope of analysis, which is primarily focused on examining the sole influence of parental education and early financial instruction on the financial literacy of consumers. This approach, while valuable, fails to account for other potential variables that may also contribute to individuals' financial understanding and capabilities. For instance, this approach neglects the crucial role of societal and cultural determinants, which can exert a substantial influence on individuals' comprehension of financial matters and their corresponding behaviors. Future research could explore other possible influences, such as peer influence, schooling, and media influence. Certainly, this paper underscores the criticality of early financial education, yet acknowledges that accurately gauging its quality remains a complex endeavor, which in turn could compromise its efficacy and introduce uncertainties regarding its success. And the examination system of early financial education may need further exploration. Even though the study is constrained by certain limitations, it nonetheless offers profound and valuable insights into the intricate relationship that exists between parental education, early financial education, and the development of consumer financial literacy. By exploring the interplay between these factors, the study sheds light on the complex dynamics that underpin financial literacy, thereby advancing our comprehension of this crucial area. The present study underscores the crucial role of investing in parental guidance and foundational financial education as key strategies for enhancing individuals' financial comprehension and broadening financial inclusion. The emphasis on early intervention, encompassing parental guidance and foundational financial education, is rooted in the belief that it lays a sturdy groundwork for individuals to cultivate a profound comprehension of financial principles and practices. Ultimately, this leads to greater financial autonomy and integration into the broader financial system. By emphasizing these avenues, the study aims to highlight the necessity for concerted efforts in promoting financial education and guidance at an early stage, as this can have lasting and beneficial impacts on individuals' financial well-being and overall economic prosperity.

DATA AVAILABILITY STATEMENT

The datasets analyzed for this study can be found at: http://www.usfinancialcapability.org/downloads.php.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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