

Determinants of UK students' financial anxiety amidst COVID-19: Financial literacy and attitudes towards debt

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Abstract

Due to the increased financial pressure—exacerbated by the COVID-19 pandemic—that students in higher education need to endure, considerable attention is being drawn towards the determinants of student financial anxiety. A conflicting picture has been captured about financial literacy, which has been shown to either be associated with better financial well-being or to be unrelated to financial stress. While discerning between financial knowledge ('objective' financial literacy) and perceived ability to manage personal finances ('subjective' financial literacy), this study also explores the impact that students' attitudes towards debt may exert on their financial anxiety. In a sample of 174 university students from the UK, we measured students' financial anxiety, objective and subjective financial literacy, attitudes towards debt and perceived impact of COVID-19 on financial behaviour. Bayesian analyses revealed that only attitudes towards debt and perception of the impact of the pandemic predicted students' financial anxiety. While the evidence in regard to financial literacy was inconclusive, mediation analyses showed that objective financial literacy indirectly impacted financial anxiety

Halimah Ravat was an undergraduate student at Birmingham City University at the time the research was carried out

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by increasing fear of debt. The findings suggest that students' financial anxiety may be reduced by adopting strategies that focus on the subjective perception of debt and of economic circumstances.

1 | INTRODUCTION

Over the past two decades, higher education (HE) reforms in England have led to the costs of HE shifting away from the state to the student (De Gayardon et al., 2019). This shift has resulted in increased borrowing, as undergraduate students in England are leaving university with an average debt of over £45,000 compared to under £10,000 at the beginning of the previous decade (Student Loans Company, 2022). In addition to future debt, British students also report difficulties meeting day-to-day living costs (Andrews & Wilding, 2004; Mazhari & Atherton, 2021; Richardson et al., 2017), which have worsened due to the economic impact of the recent pandemic; 80% of surveyed students reported financial concerns as a result of COVID-19 (National Union of Students, 2020). These circumstances have worsened further in the current cost-of-living crisis (Office for National Statistics, 2023). Given the existing evidence that financial concerns are linked to poor mental health and well-being in British students (e.g., Benson-Eggleton, 2019; Jessop et al., 2005, 2020) and that financial mental health has been cited as one of the main reasons students in England drop out of university (e.g., Nevill & Rhodes, 2004), it is important to examine factors that contribute to financial anxiety and student financial mental health.

Financial literacy refers to how well an individual can understand and use personal finance-related information (Huston, 2010) and there are some indications that, in both student and non-student samples, it is positively related to financial well-being (Hwang & Park, 2022). Accordingly, students' financial literacy has been of increasing focus for understanding student financial well-being. For example, in the UK, the Money and Advice Service—part of the Money and Pension Service, the largest financial guidance body—listed a large number of different types of financial education programmes that aim to increase knowledge of financial matters and that are available to young adults, including those about to enter university (Money Advice Service, 2018). Despite the lack of systematic assessment of the effectiveness of these different financial education programmes, research carried out in other countries suggests that higher financial literacy does not always lead to lower financial stress and better financial well-being in young adults and university students (e.g., evidence from India and the US; Peach & Yuan, 2017; Utkarsh et al., 2020). A factor potentially contributing to the mixed findings about financial well-being and literacy, in student and non-student populations, may be related to how the latter is conceptualised and measured. Financial literacy can be distinguished into its 'objective' and 'subjective' elements (e.g., Anderson et al., 2017; Xiao et al., 2014). While the former assesses levels of financial knowledge through different hypothetical financial scenarios, the latter can relate to an individual's self-assessed level of knowledge and ability to manage personal finances. Objective measures by Utkarsh et al. (2020) and Peach and Yuan (2017) on student financial literacy, in India and the US, respectively, were found not to be related to financial stress or well-being, while a subjective measure by Joo and Grable (2004) positively related to financial satisfaction in a non-student population. This aligns with meta-analyses by Hwang and Park (2022), which indicates that subjective financial literacy is more strongly related to financial well-being than objective financial literacy. Subjective measures of financial literacy have also been shown to predict reduced risky financial behaviours more strongly in US students compared to actual financial knowledge (Xiao et al., 2014). However, Britt et al. (2016) found subjective US students' financial literacy to counterintuitively relate to higher levels of financial stress in students. Given the scant research and mixed findings to date, the present study thus aims to further examine and shed light on the role of financial literacy in relation to UK students' financial well-being by separately assessing the role of both subjective and objective financial literacy in relation to financial anxiety.

Apart from their financial capability, students' financial well-being is also likely to be determined by their financial attitudes and attitudes towards debt. Strikingly, this proposition has not been comprehensively addressed in the higher education literature, despite research suggesting that students' subjective appraisal of their own financial situation is more important in predicting their psychological and financial well-being than objective indicators per se (e.g., debt amount; Jessop et al., 2020). Although students in England have become more tolerant of debt compared to the beginning of the decade (Callender & Mason, 2017; but see Boatman et al., 2022, for a different conclusion about US students, who remain more risk-averse), debt-averse attitudes remain among students and have been shown to deter potential students from pursuing HE, especially those from lower socioeconomic backgrounds (Callender & Mason, 2017).

While students' attitudes towards debt have been shown to play an important role in their financial decision-making (e.g., participation in HE; Callender & Mason, 2017), little research has examined their association with financial well-being. Some evidence collected in the US and the UK suggests that students' negative attitudes towards debt are related to poorer self-reported mental health (e.g., Chisholm-Burns et al., 2017; Cooke et al., 2004); other research from New Zealand suggests that students' fear of debt is positively associated with financial stress (e.g., Afzali et al., 2020). The existing literature, however, is relatively limited because attitudes towards debt have mainly been assessed through ad-hoc brief measures (e.g., Cooke et al., 2004) or conceptualised as a unidimensional construct (e.g., Davies & Lea, 1995). Haultain et al. (2010), however, have shown that students' attitudes towards debt are a more complex construct that is better captured by two dimensions: On the one hand, fear of debt underlies students' aversion to debt; on the other hand, debt utility assesses the extent to which students find debt useful. These dimensions, which tend to be negatively correlated with each other, have been shown to relate differently to financial outcomes; students high in debt utility tend to accrue larger debt while students with greater fear of debt tend to have greater savings (Haultain et al., 2010). Thus, the present study aims to expand and further examine the role of students' attitudes towards debt using a comprehensive measure that captures these two dimensions.

By testing both UK students' financial knowledge (and self-assessed knowledge) and their attitudes towards debt, we can also explore whether the latter might account for the association between the former and students' financial anxiety. Evidence from other countries suggests that this test is a worthy endeavour. For example, Lachance (2012) found that Canadian young adults' objective financial literacy positively predicted favourable attitudes towards credit and Shim et al. (2009) showed that US students' financial literacy predicted financial attitudes, which, in turn, predicted healthy financial behaviour of first year undergraduate students. Therefore, we aim to provide additional insight into the relationship between financial literacy and financial anxiety among UK students by exploring attitudes towards debt as a potential mediating factor.

In an effort to clarify the role that students' financial literacy may play in determining financial anxiety, the present study will discern between objective and subjective financial literacy in predicting financial anxiety. This aim will be achieved while also examining the impact of dimensions underpinning students' attitudes towards debt, namely, debt utility and fear of debt, on financial anxiety. Whether the association between students' financial literacy and financial anxiety is mediated by their attitudes towards debt will also be examined. Finally, as the present study was conducted amidst the COVID-19 pandemic that exerted a negative impact on students' financial considerations (National Union of Students, 2020), the perceived financial impact of the pandemic was also assessed. Based on the above review of the current literature, the following hypotheses are proposed:

H₁: Students' financial literacy will be negatively associated with financial anxiety:

H_{1a}: Objective financial literacy will be negatively associated with financial anxiety.

H_{1b}: Subjective financial literacy will be negatively and more strongly associated with financial anxiety compared to objective financial literacy.

H₂: Students' attitudes towards debt will predict financial anxiety:

H_{2a}: Fear of debt will be positively associated with financial anxiety.

H_{2b}: Debt utility will be negatively associated with financial anxiety.

H₃: Students' perception of how COVID-19 affected the management of their finances will be positively associated with financial anxiety.

In addition to the above hypotheses, students' attitudes towards debt will be explored as a potential mediator in the association between their financial literacy and financial anxiety.

2 | METHOD

2.1 | Participants

An a priori power analysis was conducted using the software package G*Power (Faul et al., 2007). A sample size of 157 was required to achieve power=0.80, anticipating a small-to-medium effect size (e.g., Archuleta et al., 2013) and considering the number of predictors tested in the regression analysis (see below). Due to the online nature of the study, a slight over-recruitment took place; thus, the a priori obtained study power was=0.85.

A total of 174 participants (88 females) took part in the online study (see Table 1 for the sample's characteristics). Participants' age ranged from 18 to 28 (\bar{X} =21.86, SD=2.27), and they were recruited via social media sites and online platforms, such as Facebook, Instagram, Snapchat, Twitter and Student Room Forums. On the online recruitment post, participants were advised that only students currently enrolled to any undergraduate or post-graduate degree at a university in the United Kingdom were eligible for the study, regardless of fee (e.g., UK or international, although no one classified themselves as belonging to the latter group). Participants needed also to be fluent in English and aged at least 18 years old. A total of 107 participants were of South Asian ethnic background;

TABLE 1 Participants' demographics and information about employment status and year of study.

Variable	Mean	Median	SD	Min	Max
Age	21.9	22.0	2.3	18	28
	<i>n</i>	%			
Gender					
Male	86	49.4			
Female	88	50.6			
Ethnicity					
White	52	29.9			
South Asian	107	61.5			
Black	15	8.6			
Employment status					
Unemployed	88	50.6			
Employed full-time	25	14.4			
Employed part-time	61	35.1			
Year of study					
1st year UG	50	28.7			
2nd year UG	32	18.4			
3rd year UG	58	33.3			
Post-graduate	34	19.5			

52 were White and 15 were Black. Fifty participants were first year undergraduate students, while 32 were in their second year, 58 in their third, and 34 students were studying at postgraduate level. In terms of employment, 25 participants were working full-time, 61 were working part-time and 88 participants were unemployed.

An exploration of the potential association between demographic variables revealed that, participants from South Asian (56%) and Black ethnicities (53%) were more likely to be in employment than their White counterparts (35%), $\chi^2(2)=6.55$, $p=.038$, $\phi=0.19$. Also, while 41% of South Asian students were enrolled to their 3rd undergraduate year, 50% of White students and 46% of Black students were in their 1st year of undergraduate studies, $\chi^2(6)=27.36$, $p<.001$, $\phi=0.40$. In sum, in the current sample, compared to White students, participants from ethnic minorities were more likely to be in employment and South Asian students were more likely to be near completion of their undergraduate degree.

Given the above, the impact of ethnicity was also explored for the key variables under consideration: Objective and subjective financial literacy, fear of debt, debt utility, financial anxiety and perceived impact of the pandemic. A MANOVA revealed an overall significant effect of ethnicity, $F(12, 334)=2.73$, $p=.002$, $\eta_p^2=0.089$. Individual ANOVAs showed that ethnicity significantly impacted on debt utility, $F(2, 171)=7.35$, $p<.001$, $\eta_p^2=0.079$, objective, $F(2, 171)=4.64$, $p=.011$, $\eta_p^2=0.051$, and subjective financial literacy, $F(2, 171)=8.31$, $p<.001$, $\eta_p^2=0.089$ —no other effects were significant (all $ps>.193$). Post-hoc tests with Bonferroni adjustments revealed that, compared to White students, South Asian students had lower scores for debt utility ($p<.001$) but higher scores for objective ($p=.010$) and subjective financial literacy ($p<.001$)—this pattern was also observed when non-parametric equivalent analyses were run. Overall, South Asian students had higher financial literacy and lower perceived debt utility compared to White students.

Finally, given the diversity of the sample in regard to employment status, we also explored its impact on the key variables. A MANOVA showed an overall effect of employment status, $F(12, 334)=4.2$, $p<.001$, $\eta_p^2=0.130$, which was significant for debt utility, $F(2, 171)=12.2$, $p<.001$, $\eta_p^2=0.125$, objective, $F(2, 171)=5.3$, $p=.006$, $\eta_p^2=0.059$, and subjective financial literacy, $F(2, 171)=15.6$, $p<.001$, $\eta_p^2=0.155$. Post-hoc tests with Bonferroni adjustments revealed that students who worked full-time scored significantly lower for debt utility than those who worked part-time or did not work (both $ps<.001$). Students in full-time employment also displayed significantly higher objective and subjective financial literacy than students who worked part-time or did not work (all $ps<.020$). No differences were observed between students who worked part-time and those who were not in employment (all $ps>.057$). Overall, students who were working full-time had less relaxed attitudes towards debt and were more financially literate compared to students who either did not work or did so part-time.

Crucially, all key analyses were adjusted to control for ethnicity, employment status, year of study, gender and age. As the study examined financial anxiety, participants with any previous diagnosis of anxiety or any other mental health disorder were advised not to partake in the study.

2.2 | Design and materials

2.2.1 | Demographics

Participants were asked to indicate their age and year of study (e.g., Cooke et al., 2004; Haultain et al., 2010), gender (e.g., Harrison & Agnew, 2016; Peach & Yuan, 2017), ethnicity (e.g., Callender & Jackson, 2005) and employment status (e.g., Christie et al., 2001).

2.2.2 | Financial anxiety

The Financial Anxiety Scale, developed by Archuleta et al. (2013) in a student population, asks participants to respond to seven statements assessing financial anxiety on a seven-point scale ranging from 1='Never' to

7='Always'. Items include statements such as 'I feel anxious about my financial situation' and 'I have difficulty sleeping because of my financial situation'. High scores indicated high levels of financial anxiety.

2.2.3 | Attitudes towards debt: Fear of debt and debt utility

The original 25 items from Haultain et al. (2010) were included to assess students' attitudes towards debt. In order to assess the bi-dimensional structure of attitudes towards debt, similar to Haultain et al. (2010) and subsequent studies (e.g., Afzali et al., 2020), only nine of these items were carried forward to analysis in accordance with the confirmatory factor analysis of a two-factor structure of attitudes towards debt by Haultain et al. (2010). Of these nine items, four represented the fear of debt subscale and included items such as 'One of the worst aspects of tertiary education is being in debt'. The debt utility subscale comprised of five items, for example: 'Taking out a loan is a good thing, because it allows you to enjoy life as a student'. Participants responded to each item using a five-point Likert scale, ranging from 1='Strongly disagree' to 5='Strongly agree'. High scores on the fear of debt sub-scale indicated greater aversion to debt, while higher scores on the debt utility sub-scales represented a more relaxed attitude towards debt.

2.2.4 | Subjective financial literacy

Self-reported efficacy about financial behaviours was measured using the Responsible Financial Behaviour scale (Perry & Morris, 2005). Participants rated themselves on financial behaviours (e.g., controlling their spending and planning for their financial future) using a five-point Likert scale ranging from 1='poor' to 5='excellent'. High scores indicated better self-perceived responsible financial behaviours.

2.2.5 | Objective financial literacy

To measure participants' knowledge of financial products the Big Five financial literacy questions (Anderson et al., 2017) were administered. Similar to prior studies (e.g., Agnew & Harrison, 2015), participants were presented with different hypothetical financial scenarios (e.g., about inflation) and had to select the correct response. The total score indicates how many items participants answered correctly out of five; thus, high scores indicated greater financial knowledge.

2.2.6 | Perceived impact of the ongoing pandemic on financial behaviour

To measure the perceived impact of the current COVID-19 pandemic on the way participants manage their finances, they answered the statement 'To what extent has the recent economic decline affected the way you manage your money' (Serido et al., 2014) using a five-point Likert scale ranging from 1 = 'Strongly agree to 5 = 'Strongly disagree'. Scores were reverse coded; thus, higher scores indicated a greater perceived impact.

2.3 | Procedure

The study was approved by the University's ethics committee. Once directed to the survey hosted on Qualtrics®, participants were asked to report demographic information. Participants then completed the measures in the order listed above.

2.4 | Analysis

No incomplete data sets were gathered as participants had to answer all questions prior to submitting their data; for some items participants were given the opportunity to respond by selecting the option 'Prefer not to say', although none chose to do so.

In order to include the categorical variables into the regression equation, dummy coding was performed. Specifically, White participants were chosen as the baseline category for the ethnicity variable, with South Asian and Black students being represented by two dummy variables. Similarly, first year students were chosen as the baseline category and thus three dummy variables were required to capture year of study (second year, third year and postgraduate study). Finally, the baseline category for employment status was represented by those students who were not in employment; two dummy variables captured those students who either worked part- or full-time during their studies.

3 | RESULTS

Descriptive statistics (see Table 2) highlight students' average financial anxiety levels (\bar{X} = 24.9 on the 7–49 range) and relatively averse attitudes towards debt: The mean fear of debt score (\bar{X} = 17.0 on the 4–20 potential range) was close to the high end of its scale while debt utility averaged around the middle of its range (\bar{X} = 14.7 on the 5–25 range). Students' perceived impact of the pandemic was relatively large as responses clustered around the high end of the scale (\bar{X} = 4.4 on the 1–5 range). Participants' self-reported (\bar{X} = 15.8 on the potential 5–25 possible range) and objective financial knowledge (\bar{X} = 2.5 on the 0–5 range) were average.

Correlational analyses are presented Table 3. Financial anxiety was positively associated with fear of debt and was negatively associated with debt utility. Both objective and subjective financial were weakly positively

TABLE 2 Descriptive statistics for financial anxiety, attitudes towards debt, financial literacy and perceived impact of the pandemic.

Variable	Mean	Median	SD	Min	Max
Financial anxiety	24.9	21.0	10.7	7	49
Fear of debt	17.0	17.0	2.2	10	20
Debt utility	14.7	14.0	5.7	5	25
Subjective financial literacy	15.8	16.0	5.4	6	25
Objective financial literacy	2.5	2.0	1.8	0	5
Perceived impact of the pandemic	4.4	5.0	0.8	1	5

TABLE 3 Spearman's ρ coefficients for the correlation between the variables.

Variable	1	2	3	4	5
1. Financial anxiety					
2. Fear of debt	0.52***				
3. Debt utility	-0.34***	-0.31***			
4. Subjective financial literacy	0.24*	0.10	-0.76***		
5. Objective financial literacy	0.25*	0.28***	-0.66***	0.68***	
6. Perceived impact of the pandemic	0.45***	0.32***	-0.10	0.18	0.35***

Note: * $BF_{10} > 10$; ** $BF_{10} > 30$; *** $BF_{10} > 100$.

associated with financial anxiety. Moreover, financial anxiety was strongly associated with a higher perceived impact of the current pandemic on financial behaviours.

The regression assumptions were checked. Residuals were normally distributed and centred around zero. Inspection of the residuals over predicted values and all partial scatterplots revealed that the assumptions of homoscedasticity and linearity were met, respectively. No issues with multicollinearity were observed as, despite the relatively high correlations between some predictors, tolerance values were relatively high as all were >0.30 .

A linear regression Bayesian analysis was run. The purpose of Bayesian analyses is to quantify the evidence in favour of a specific model or hypothesis by updating prior beliefs about it (i.e., its prior distribution) on the basis of the observed data. The key inferential statistic is the Bayes Factor (BF), which measures the strength of evidence of one model compared to another given the data obtained. According to Kass and Raftery (1995), BF values greater than 1 indicate anecdotal evidence, $BF > 3$ can be interpreted as moderate evidence, $BF > 10$ as strong evidence and $BF > 100$ as decisive evidence for the hypothesis under consideration when compared to an alternative. In particular, the term BF_{10} indicates the direction of the model of comparison, which was in favour of the alternative hypothesis; if BF_{01} had been used, it would have indicated the strength of the evidence in favour of the null hypothesis.

In our analysis, we utilised the model-averaged posterior distribution for the regression coefficients and we compared each model to the null model to estimate the BF for each model. Thus, we performed the equivalent of a two-step hierarchical regression and controlled for gender, age, ethnicity, year of study dummies, and employment by including them in the null model. We relied on a uniform a priori probability for the prior over the models because it is weakly informative as it assigns an equal a priori probability to all models. In terms of the prior on the values of the regression coefficients, we used the default Jeffreys–Zellner–Siow distribution (JZS; Zellner & Siow, 1980). To test the robustness of the findings, we varied the JSZ prior parameter width from the narrow $r=0.25$ to the wider $r=1$ (Wagenmakers et al., 2018): Wider prior distributions indicate greater a priori uncertainty about the effect under considerations. As results did not change, we report the outcomes based on the default width $r=0.35$. We also used different sampling methods from the model space, the Bayesian Adaptive Sampling (BAS) and the Markov chain Monte Carlo (MCMC; Clyde et al., 2011) to determine the model-averaged posterior distribution for the regression coefficients. As again the results did not change, we report the results under the BAS method.

The analysis shows that the best model, as indicated by the highest BF_{10} (see Table 4), was the one that included fear of debt, debt utility, objective financial literacy and the perception of the impact of the pandemic.

TABLE 4 Prior, $P(M)$ and posterior, $P(M|Data)$ model probabilities, posterior odds (BF_M), and Bayes Factors (BF_{10}) for the 10 best models predicting Financial Anxiety.

Models	$P(M)$	$P(M data)$	BF_M	BF_{10}	R^2
Null model (incl. age, gender, ethnicity, year of study, employment)	<0.1	$3.2e-16$	$9.8e-15$	1.00	0.220
FoD+DU+OFL+PI	<0.1	0.3	15.5	$1.1e+15$	0.543
FoD+DU+PI	<0.1	0.2	15.1	$1.0e+15$	0.534
FoD+DU+SFL+OFL+PI	<0.1	0.1	8.5	$6.8e+14$	0.548
FoD+DU+SFL+PI	<0.1	0.1	4.1	$3.7e+14$	0.536
FoD+SFL+PI	<0.1	<0.1	0.1	$1.2e+13$	0.505
FoD+SFL+OFL+PI	<0.1	<0.1	0.1	$8.6e+12$	0.512
FoD+PI	<0.1	<0.1	<0.1	$7.5e+11$	0.478
DU+OFL+PI	<0.1	<0.1	<0.1	$5.5e+11$	0.485
DU+PI	<0.1	<0.1	<0.1	$5.4e+11$	0.475

Note: We limited the output to the best 10 models for ease of interpretation.

Abbreviations: DU, debt utility; FoD, fear of debt; OFL, objective financial literacy; PI, perceived impact of pandemic; SFL, subjective financial literacy.

Posterior summary coefficients analysis on each individual predictor offered decisive evidence for the perceived impact of the pandemic, $BF_{10}=1.4e+06$, fear of debt, $BF_{10}=2227.5$, and debt utility, $BF_{10}=148.5$. The latter value indicates that, given the observed data, debt utility was almost 150 times more likely to be a predictor of financial anxiety compared to the null hypothesis that it was not. The strong association between the perceived impact of the pandemic and financial anxiety is indicated by the former's coefficient, which indicates that each point increase in the perceived impact of the pandemic was associated with a 4.7-point increase in financial anxiety. On the other hand, the evidence in regard to financial literacy was only anecdotal and it was supportive for objective financial literacy ($BF_{10}=1.2$) but it was confuting for subjective financial literacy ($BF_{10}=0.5$; see Table 5).

Mediation analysis using bootstrapping (1000 replications) using JASP Team (2022) was performed to examine the mediating role of attitudes towards debt on financial anxiety through financial literacy. Both financial literacy indices were entered as the predictors and both dimensions of attitudes towards debt as the mediators. The analysis revealed that the indirect effect between subjective financial literacy and financial anxiety via both dimensions of attitudes towards debt was not significant ($p=.839$; $\beta=-0.01$, $SE=0.02$; 95% CI = $-0.05, 0.03$). On the other hand, the indirect effect between objective financial literacy and financial anxiety via attitudes towards debt was significant ($p<.001$; $\beta=0.13$, $SE=0.03$; 95% CI = $0.05, 0.21$). In particular, fear of debt was a significant mediator (path a1b1 in Figure 1; $\beta=0.11$, $SE=0.03$; 95% CI = $0.05, 0.20$, $p<.001$), while debt utility was not (a2b2 in Figure 1; $\beta=0.02$, $SE=0.02$; 95% CI = $-0.02, 0.06$; $p=.300$).

4 | DISCUSSION

The findings offered support to hypotheses H_{2a} and H_{2b} as students' attitudes towards debt strongly predicted their financial anxiety. Higher levels of financial anxiety were observed for those students who reported greater fear of debt and who regarded its utility to be low. Such findings are consistent with previous research indicating that students' attitudes towards debt and subjective measures of students' financial situation are key in predicting their financial well-being (e.g., Jessop et al., 2005). Thus, the present results add to the growing body of literature illustrating the importance of students' perceptions and attitudes towards debt, beyond debt itself, being key to the understanding of student financial well-being (e.g., Jessop et al., 2020; Schmidtko et al., 2020). These findings also suggest that, while existing financial interventions aimed at improving prospective university students' financial capability (e.g., Money Advice Service, 2018) might be a worthy endeavour for increasing students' familiarity and confidence with financial concepts and products, they may be relatively ineffective at appeasing the relatively high levels of financial anxiety due to economic circumstances like the current cost-of-living crisis.

TABLE 5 Posterior summaries of coefficients for the individual predictors.

Coefficient	P(incl)	P(incl data)	$BF_{inclusion}$	Coefficient	SD	95% confidence interval	
						Lower	Upper
Perceived impact of the pandemic	0.5	1.0	1.4e+06	4.7	0.8	3.1	6.3
Fear of debt	0.5	1.0	2227.5	1.3	0.3	0.7	1.9
Debt utility	0.5	1.0	148.5	-0.7	0.2	-1.0	-0.3
Objective financial literacy	0.5	0.6	1.2	-0.5	0.6	-1.7	0.1
Subjective financial literacy	0.5	0.3	0.5	0.1	0.2	-0.1	0.5

Note: Prior, P(incl) and posterior, P(incl|data) probabilities and Bayes factors ($BF_{inclusion}$) for the five predictors of financial anxiety based on Bayesian model averaging.

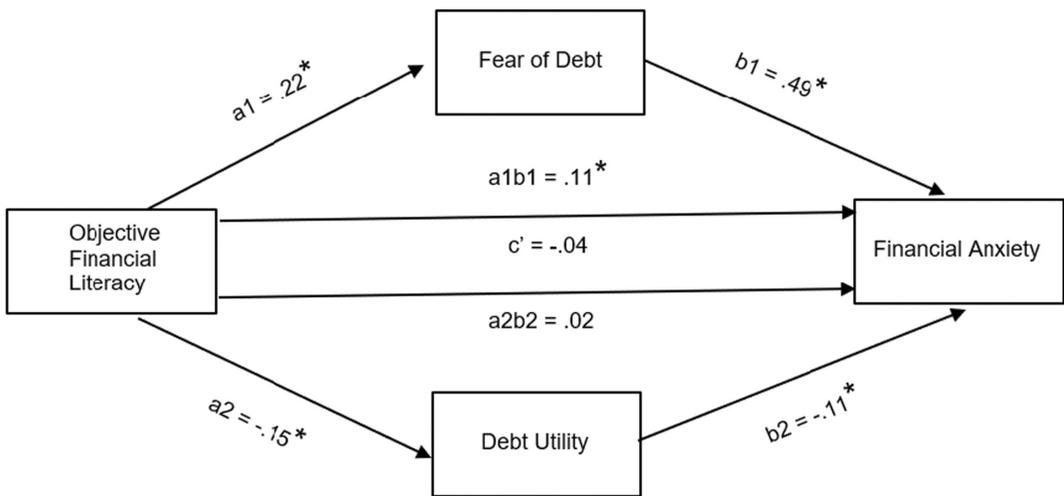


FIGURE 1 Mediation model between objective financial literacy and financial anxiety with attitudes towards debt as the mediators. *Note:* Path coefficients are standardised estimates β . Estimates are based on the mediation model that includes subjective financial literacy as the second independent variable. *ab* paths represent the indirect effects, and *c'* is the direct effect. * = Significant paths.

Additionally, the present study also underlines the nuanced nature of students' attitudes towards debt. Although students' fear of debt and debt utility have been previously conceptualised as end points of the spectrum of attitudes towards debt when the latter were assessed via brief ad-hoc measures or a unidimensional construct (e.g., Cooke et al., 2004; Davies & Lea, 1995), the present study suggests that assessing them separately can offer additional insight on their relationship with relevant outcomes such as students' financial anxiety. Indeed, fear of debt and debt utility correlated negatively, as expected, but did so only to a moderate degree ($r = -0.31$). Moreover, mediation analyses confirmed that only students' fear of debt—and not debt utility—mediated the association between their financial literacy and their financial anxiety.

H_{1a} and H_{1b} were not supported as inconclusive evidence was gathered in regard to the impact of students' subjective and objective financial literacy on their financial anxiety. While evidence in support of the latter was anecdotal, the findings overall do not further clarify the nature of the direct impact—if any—of students' financial literacy on their financial anxiety. However, in our sample of students from the UK, objective financial literacy was associated with greater fear of debt, which, in turn, was related to elevated levels of financial anxiety. This result is aligned with previous research in the US that found that students' financial attitudes mediate the association between financial literacy and financial outcomes (e.g., financial behaviours; Shim et al., 2009). Counterintuitively, higher financial knowledge was observed to indirectly increase students' financial anxiety through fear of debt. While this finding is unexpected based on prior research on non-student populations (e.g., Hwang & Park, 2022), similar findings have been observed in students, such as finding of Britt et al. (2016) that financial literacy relates positively with financial stress in US students. This highlights the need to exercise caution and refrain from generalising findings from non-student populations to student populations (e.g., Joo & Grable, 2004)—for example due to the difference in experience with debt between them—and from general types of debt to student debt. Specifically, student debt in the UK is income-contingent, with loan repayments starting after graduation once income crosses a set threshold. Nevertheless, even if this form of debt repayment is arguably more advantageous than commercial debt—as it can be more easily appraised with greater financial literacy—the findings from our study indicate that students' financial anxiety is more strongly determined by emotion-driven components of attitudes towards debt (i.e., fear of debt) compared to more cognitive determinants of their attitudes (i.e., debt utility).

Although future research is required to explore further why financial literacy may lead to greater financial anxiety in students, a reciprocal relationship between financial knowledge and fear of debt may explain this unexpected finding: Students who learn about good financial literacy may develop debt-averse attitudes, as financial education often highlights the potential risks and negative consequences associated with debt (Kasman et al., 2018). Conversely, those who are more concerned about the prospect of debt may be more motivated to enhance their financial literacy and acquire good financial practices, including minimising debt. The precarious circumstances stemming from the recent COVID-19 pandemic may have contributed to this association; for instance, individuals who possess greater financial literacy may have developed more cautious attitudes towards borrowing, particularly during periods of economic uncertainty. Albeit indirectly, the observed positive association between objective financial literacy and the perceived impact of COVID-19 on financial management corroborates this proposition.

On the other hand, debt utility—as opposed to fear of debt—refers to more favourable attitudes towards debt. It could be suggested that students who view debt as useful, as opposed to a burden or concern, may be less motivated to learn to avoid it. Moreover, debt utility may more weakly associate with financial anxiety—an affective response—as it may hinge on cognitive components of the attitudes towards debt, as compared to the affective attitudinal elements tapped on by fear of debt (see Xiao et al., 1995, for a similar argument regarding US students' attitudes towards the use of credit cards).

We consider the mediating effect of fear of debt noteworthy, but due to the cross-sectional design, it is important to further investigate the indirect association between students' financial literacy and their financial anxiety observed in the present study, especially given the continuing macroeconomic instability from the recent pandemic and ongoing cost-of-living crisis (Unite Students, 2022). Longitudinal research assessing students' financial literacy and attitudes towards debt would be able to examine whether they evolve and interact to impact financial anxiety over time. This approach would allow for greater confidence when making causal claims about the mediating effect of students' attitudes towards debt, specifically, fear of debt, between financial literacy and financial anxiety, as well as examine potentially relevant factors, including gender (e.g., Agnew & Harrison, 2015) and math ability (e.g., Al-Bahrani et al., 2020).

Students who reported greater change in money management behaviour due to the economic impact of COVID-19 were more likely to report higher levels of financial anxiety, indicating that H_3 was supported. Given how students have been affected financially and otherwise by the recent pandemic and ongoing cost-of-living crisis (e.g., National Union of Students, 2020; Unite Students, 2022), this finding further underscores the importance of assessing students' perception of the current financial outlook when exploring financial well-being. Additional research is required to establish the long-term implications of macroeconomic perceptions on students' reported financial anxiety. Specifically, future research should examine how students' perception of their economic future (i.e., post-graduation), in addition to their current financial situation, have been impacted by COVID-19 and the cost-of-living crisis, and how this may relate to financial anxiety (e.g., Netemeyer et al., 2018).

We acknowledge a number of limitations to our study. First, as aforementioned, the cross-sectional design limits any ability to make causal claims about the relationships between the constructs measured. Second, the present study assessed undergraduate and postgraduate students together, which fails to acknowledge potential differences between these groups with respect to the experience of financial anxiety, attitudes towards debt and debt available to them. Third, the current report over-sampled from ethnic minority groups. This is a strength relative to many studies where these groups are under-represented and allowed us to more fully investigate how ethnicity relates to debt attitudes. For instance, we observed that, compared to their White counterparts, South Asian students were more likely to be near completion of their undergraduate degree, to be in employment and to have higher financial literacy and lower debt utility. These patterns are indicative of distinct financial experiences during study and highlight ethnicity as an important determinant of debt attitudes. Future work should seek to examine whether ethnicity and socioeconomic factors interact with debt attitudes to determine financial wellbeing. At the same time, however, the over-sampling of ethnic minority groups may limit extrapolation to the

wider UK student population. Over 60% of our sample were South Asian students, compared to just over 12% of first year entrants in the UK in 2019–20 (Higher Education Statistics Agency, 2022). In the current studies, we have taken care to control for all key demographic variables including ethnicity, however, and so are confident that these findings will hold in samples with different ethnic compositions. Fourthly, some key information about the students was not collected, even though it may impact on their experience with debt and on their financial profile. For example, we did not gather information about students' modality of study, even though full- and part-time students are likely to adopt different financial strategies and experience different financial circumstances. In England, as of 2020–2021, almost one in five undergraduate students attended university part-time (Hubble & Bolton, 2022). We also did not ask participants to indicate whether they were enrolled to a four year undergraduate course, which includes a one year placement, despite this modality of study being on the rise in the UK (e.g., Department for Education, 2019). Finally, country of origin was not controlled for; tuition fees and student finance arrangements vary significantly between the four UK countries (UCAS, 2023), and as such, may impact key constructs (e.g., attitudes towards debt). Despite these limitations, the present study provides a basis for future longitudinal research to examine whether the relationships observed are causal in nature.

In conclusion, this study suggests that, while strategies aimed at promoting and improving financial literacy in HE settings are advisable, especially given the low levels of financial literacy observed in student populations (Agnew & Harrison, 2015), they might not effectively reduce financial anxiety. It is suggested that a focus on students' attitudes and perception towards debt and financial management should also be considered a priority when attempting to address students' financial anxiety.

AUTHOR CONTRIBUTIONS

Jessica M. Perry: Formal analysis; writing – original draft; writing – review and editing. **Halimah Ravat:** Conceptualization; data curation; formal analysis; investigation; methodology; writing – original draft; writing – review and editing. **Emma Bridger:** Writing – review and editing. **Pelham Carter:** Writing – review and editing. **Silvio Al-drovandi:** Conceptualization; formal analysis; methodology; supervision; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Ethical approval was obtained prior to data collection by the university's ethics committee, which is in line with the British Psychological Society (BPS) ethical guidelines.

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