Income more important than financial literacy for improving wellbeing

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Abstract

As advocates of financial literacy education, it is a hard pill to swallow when data show little impact on financial behaviors. Unfortunately, expectations that university students with higher levels of financial literacy have reduced money management stress and positive financial behavior, leading to higher levels of financial wellbeing, were expunged in this study. We did find, however, that being older and having higher levels of income contributed most significantly and consistently to explaining better financial wellbeing. Proponents of financial literacy education should not despair but instead recognize the limits to transferring financial knowledge and set financial literacy and wellbeing goals based on evidence of what works. © 2021 Academy of Financial Services. All rights reserved.

1. Introduction

What is more important to an individual; financial literacy or financial wellbeing? Sure, financial mistakes are costly, but to what extent do they impact on an individual's level of satisfaction with their financial situation? Further, how can financial literacy interventions effectively improve wellbeing outcomes? Financial wellbeing therefore, is a topic of

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increasing importance to academics, public policy officials, educators, financial managers, and employers (CFPB, 2015). While there is a plethora of studies available that advocate for consumer protection through financial literacy interventions (Fernandes, Lynch, & Netemeyer, 2014) and policy support for financial literacy education in an attempt to increase economic participation, improve social inclusion and enhance economic health (ASIC, 2017; OECD, 2012), there has been less work done on what constitutes financial wellbeing or its role in overall wellbeing (Netemeyer, Warmath, Fernandes, & Lynch, 2018).

This study utilizes the financial wellbeing framework of Netemeyer et al. (2018) to measure the determinants of financial wellbeing of university students. University students are an important cohort of interest, and many institutions are discovering that first-generation, students of color, adults and military veterans are the "new majority" (Lyon & Matson, 2019). Thus, universities represent a diverse array of people with differing socio-economic backgrounds and are at a pivotal point in their life, making decisions that affect their financial futures.

Using a survey of 420 students from an Australian university in 2019, we quantify the impact of current money management circumstances, attitudes towards future finances and financial literacy on levels of financial wellbeing. Ordered logit results find that the financial wellbeing framework applied to our sample does not explain financial wellbeing particularly well. Financial literacy does not play an important role, but income does. These findings may be context specific, as students experience low and irregular incomes, which can lead to increased vulnerability to external shocks and uncertainty. However, many other workers experience irregular incomes due to the rise of the gig economy (Farrell & Greig, 2016; Kaine, Oliver, & Josserand 2017; Stewart & Stanford, 2017).

Accordingly, this paper is set out as follows. Section 2 provides an overview of the theoretical framework and a review of the literature. The data and methodology are discussed in Section 3. Results are presented in Section 4 and the paper concludes with a discussion in Section 5.

2. Background

There are a number of definitions of financial wellbeing that are being used in academic literature, industry reports and government policies (ANZ, 2018). However, due to the absence of a widely accepted definition and measure of financial wellbeing, efforts to examine the financial domain have been hampered (Netemeyer et al., 2018). Internationally, the Consumer Financial Protection Bureau (CFPB) report in 2015 provided a consumer driven definition of financial wellbeing as "a state of being wherein a person can fully meet current and ongoing financial obligations, can feel secure in their financial future, and is able to make choices that allow enjoyment of life" (p. 18). This definition has also been adopted by the OECD (OECD, 2020). The CFPB report highlights multiple factors that affect the level of financial wellbeing of an individual with a wide variation in how people in the United States feel about their financial wellbeing. Key findings were that having a savings safety

net had the strongest relationship to financial wellbeing, given that feeling financially secure is fundamental to the definition of financial wellbeing. Certain experiences with debt and credit, however, seem to have the strongest negative relationship with financial wellbeing. Individual characteristics were also factors associated with financial wellbeing; those with higher levels of education, older individuals and adults in better physical health tended to have higher levels of financial wellbeing (CFPB, 2015). Average financial wellbeing, however, appeared to be the same for men and women. Although financial circumstances were highly correlated with financial wellbeing scores, the report found that individuals with different experiences can arrive at the same score, suggesting that no single factor is responsible for, or indicative of, an individual's level of financial wellbeing.

In Australia, research undertaken by Muir et al. (2017) used an ecological systems approach to explore financial wellbeing. Financial wellbeing was said to consist of three interrelated dimensions. The first was having adequate income to pay off debt, meet basic needs and cover unexpected expenses with some money left over. The second was feeling and acting in control of finances, and the third included feeling financially secure. Financial wellbeing has objective (savings) and subjective (how the person is feeling) components. Muir et al. (2017) use this lens to look at individual, household, family, peer-level, community, and social influences on financial wellbeing, and find that financial capability, financial inclusion, social capital, and economic resources (especially income) are among the strongest influencers of financial wellbeing. Thus, improvement in each of these four areas are likely to enhance a person's financial wellbeing both in times of financial adversity and in the context of everyday money management. Similar to the (CFPB, 2015) research, having savings and building resilience for unexpected expenses were both important. In addition, CFPB research finds social capital to be significantly associated with financial wellbeing, that is, having support from others as well as access to resources if needed. Further, a study by Collins & Urban (2020) in the United States found financial well-being to generally follow the life cycle, increasing with income and savings levels as well as with age. They also found that levels of financial wellbeing were not strongly associated with financial literacy.

Recent contributions to developing a better understanding of financial wellbeing have applicability to university students. Netemeyer et al. (2018) suggests that the definition of financial wellbeing presented by the CFPB (2015) overweights current money management concerns. They argue that people under current money management stress can still expect to be financially better off in the future and explains prior studies of self-reported higher levels of financial wellbeing than would be expected giving current circumstances (Berman, Tran, Lynch, & Zauberman, 2016; Finke, Howe, & Huston, 2017; Johnson & Krueger, 2006). As such, individuals who perceive their circumstances to be modifiable will be more likely to engage in self-improvement actions (Summerville and Roese, 2008).

Consequently, Netemeyer et al. (2018) disentangled financial wellbeing into two related but separate constructs; current money management stress and expected future financial security, as shown in Fig. 1. The research of Netemeyer et al. (2018) was particularly interesting regarding the impact of income on financial wellbeing, as it was not found to be a direct positive predictor. Instead, income moderates the effect of current money management stress on wellbeing, and as income levels rise the negative effect of money management stress on an individual's wellbeing dissipates. Holding constant other factors and the perceived
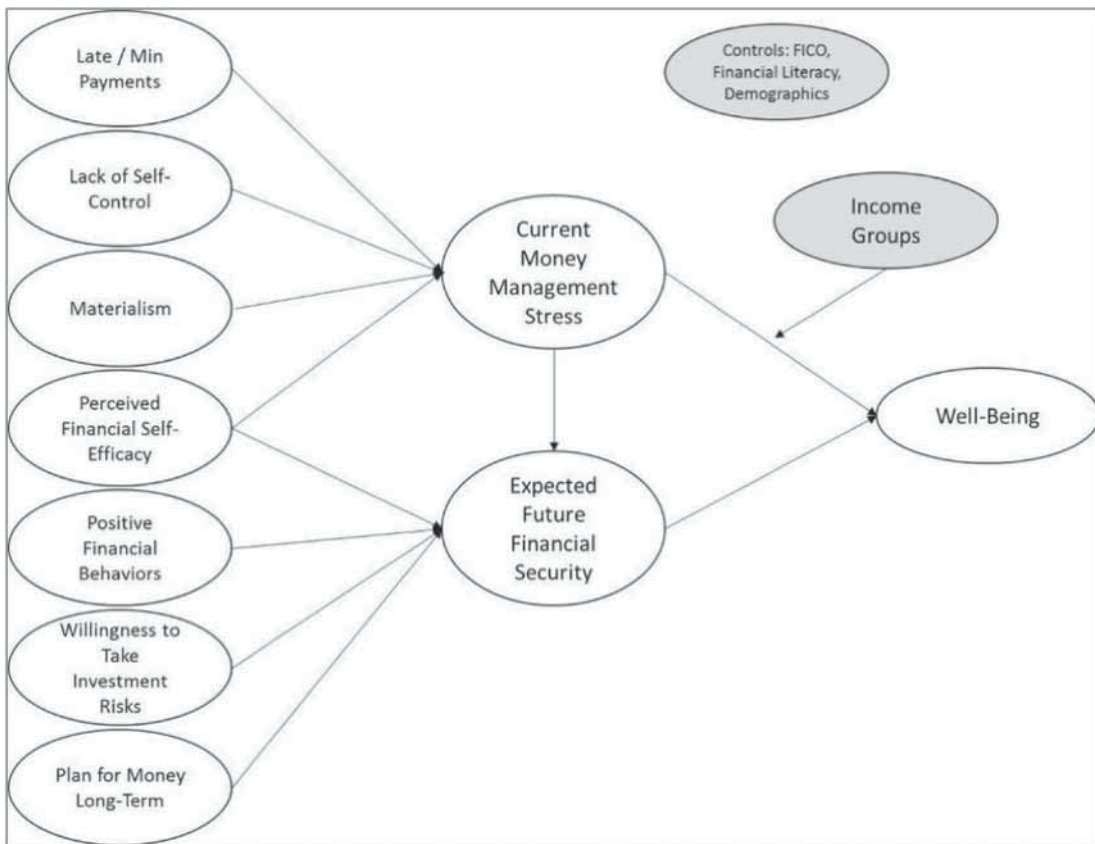
Fig. 1. Potential antecedents and consequences of perceived financial well-being. *Source*: Netemeyer et al. (2018, p. 72).

financial wellbeing constructs, income only increases overall wellbeing when current money management stress is high (Netemeyer et al., 2018). That is, current money management stress has a serious detrimental effect on wellbeing among low-income individuals. For low income earners, the focus should be on reducing debilitating current money management stress that is not something that increasing financial literacy could likely achieve.

For students, this framework is especially salient. Students can be optimistic about their future income prospects due to their human capital investment in the program of study. Thus, they may heavily weight the future and discount the present financial discomfort if seen as a short-term circumstance. Current research by Timmerman & Volkov (2019) investigates the impact of career choice and education level on an individual's overall wealth by finding the present values of future earnings for various occupations and makes some interesting comparisons by trading off against the human capital investment required. For example, one would expect future incomes to be higher for doctors and dentists than human resource advisers, but the human capital investment is often also higher. As all students are more likely to be relatively low-income earners due to giving up income generating opportunities to study, it is important to quantify the extent to which financial literacy moderates current money management stress.

University campuses host a wide variety of students—from school leavers to career changers to employed professionals and international students. Accordingly, it can be

difficult to make assumptions about the typical student. However, for many, study accompanies a period of reduced income and independent living for the first time, which provides a financial challenge. Surveys often report that students struggle to afford basic study support tools such as textbooks, for example (Dean & Forray, 2018; Senack, 2015).

There is a wide literature on the financial stress of students, usually originating out of the United States, where student debts are similar to bank loans and total over $1.5 trillion (Williams & Oumlil, 2015). Australian students are less likely to experience hardships caused by this style of student loan due to the income contingent nature of the Australian government Higher Education Loan Program (HELP; West, 2020). However, the HELP student debt still has the ability to hinder students' future borrowing capacity and a deficit in financial literacy can mean that these students are more likely to underestimate future student loan payments and hence be more vulnerable to unexpected financial shocks postgraduation (Artavanis & Karra, 2020). Evidence also suggests that student debt anxiety is a factor that may affect the wellbeing of students. Harrison and Agnew (2016) found that when student confidence in their education as an investment was higher, debt anxiety was lower. Having a tertiary degree is linked to financial wellness by a higher magnitude than student debt is linked to financial stress (Henager & Wilmarth, 2018). This distinction is important for students to understand when making study decisions. These perceptions were also found to be connected to subject choices. Business students had higher confidence in a return on their education than that of social science students, a likely reflection of graduate salary expectations (Luthans, Luthans, & Chaffin, 2019; Peach & Yuan, 2017). On the matter of study choice, Cull & Whitton (2011) survey 472 students in Sydney and find that financial knowledge is dependent on field of study, income, and age. For example, science students scored better on questions regarding interest, but regarding fees, tax and student debt knowledge, income was a better predictor.

U.S. studies also point to poor financial behaviors demonstrated by college students. For example, Mae (2009) found that over half of college students had four or more credit cards, and 90% indicated using credit to pay for education expenses including text books, school supplies, and commuter costs. In addition, many survey respondents appeared to use credit cards to live beyond their means. Studies also found poorer behaviors among females. Female students in the United States were likely to carry a higher number of credit cards, exhibit more problematic credit card behaviors (e.g., not paying bills on time), and asking parents for help to pay bills (Hancock, Jorgensen, & Swanson, 2013; Norvilitis, Szablicki, & Wilson, 2003; Worthy, Jonkman, & Blinn-Pike, 2010). Australian females are similar. Ha (2013) surveyed 257 students at universities in Melbourne and found that senior female students had irresponsible patterns of credit card use while junior students had responsible patterns. Many female students sought financial help from friends and family or approached external sources of help such as financial counsellors, government, and non-government agencies.

A further challenge to managing finances is the pressure to conform to social norms through consumer spending that is particularly challenging for young adults (Georgarakos, Haliassos, & Pasini, 2014; Spencer, Nieboer, & Elliott, 2015; Vaitilingam, 2016). Young people are more likely to hold potentially destructive beliefs about money, with materialism being a personality trait likely internalized early in life (Mentzer, Klontz, Klontz, & Britt,

2011; Richins, 2004) and personality found to be an important predictor of financial satisfaction (Tharp, Seay, Carswell, & MacDonald, 2020). Lifestyle aspirations spurred on by influence of various forms of media or peers are likely to increase young people's reliance on debt (Fear and O'Brien, 2009). The introduction of new financial products such as *Afterpay* and *Zip Pay* have further exacerbated the spending on non-essential items by young people, with almost a quarter of *Zip Pay* customers under the age of 24 (Dutta, Singh, & Sultana, 2019). Students, therefore, may undertake risky financial behaviors, especially low-income students due to the limited availability of financial resources (Bester et al., 2008).

Finally, financial literacy researchers concur that a lack of knowledge of financial concepts before entering tertiary study contributes to an experience that can be financially stressful. Studies find that in general, young people, older people, women, and minority groups have lower levels of financial literacy (West & Worthington, 2018; Wilkins, 2018). Lusardi, Mitchell, & Curto (2010) found that financial literacy of young people was poor in the United States, leading to a long list of negative consequences. These consequences include problems with debt (Lusardi & Tufano, 2009), reduced stock market participation and risk taking (van Rooij, Lusardi, & Alessie, 2007; West & Worthington, 2014), lower likelihoods of choosing investments with lower fees (Hastings & Tejeda-Ashton, 2008), lower likelihoods of accumulating wealth and managing wealth effectively (Hilgert, Hogarth, & Beverly, 2003; Stango & Zinman, 2007) and lower likelihood of planning for retirement (Bongini & Cucinelli, 2019; Lusardi & Mitchell, 2006, 2007, 2009).

More recent studies in the United States continue to show alarmingly low levels of financial literacy among undergraduate students with Artavanisa and Karra (2020) finding a literacy rate of 39.5% in addition to a large gender gap with female students exhibiting considerably lower literacy rates (26%) than their male peers (56%). Compared with earlier studies in the United States, such as Chen and Volpe (1998), it seems that financial literacy has not improved and continues to limit the ability of students to manage their finances and make informed decisions.

Overall, the combined lack of financial knowledge and limited availability of financial resources for tertiary students may contribute to lower levels of self-reported financial wellbeing. Students with lower levels of financial literacy are more likely to mismanage their finances now and, in the future, contributing to poor financial behaviors that are prevalent in today's society (Jorgensen, 2007). This is further supported by Philippas and Avdoulas (2020) who found that financially literate students have a 1.8 times higher possibility of having higher levels of financial well-being than financially illiterate students. They also found that the financial fragility of students had a significant impact on financial wellbeing with no financially fragile students showing higher levels of financial well-being.

This study contributes to the literature by applying the financial wellbeing framework of Netemeyer et al. (2018) to the Australian university student context. As the literature highlights, this cohort has particular financial challenges and are actively making decisions that affect financial futures. Accordingly, we hypothesize that expectations of the future play a more significant role in financial wellbeing outcomes than current financial stress, as students are likely to see their current situation as temporary. Thus, the financial wellbeing model may have different outcomes when applied to university students than the general population. We also consider gender differences in financial literacy and how this impacts

financial wellbeing. This study addresses these gaps in the literature and provides practitioners and educators with an understanding of where interventions are best targeted.

3. Data and methodology

This study applies the novel financial wellbeing framework as adopted from Netemeyer et al. (2018) to investigate the role of financial literacy in improving financial wellbeing outcomes. Data for this study was obtained from a survey of students from an Australian university in 2019, ethics approval (2019/160). A monetary incentive by way of a prize draw was provided to improve response rates (Yu et al., 2017); 420 students responded to the survey, providing a good sample size. However, it was only 0.9% of the total number of students enrolled at the university, even though all students were invited to participate via a broadcast email. When interpreting results, the relatively small sample size and distribution of the characteristics may not be representative of the larger tertiary student cohort. For example, 63% of respondents were female, while around 58% of university students at this institution were female. Further, the average respondent is aged 23 years or younger. This presents implications for interpretation and generalization of results, as it may be that financial knowledge is not well developed in young adults and difficult to detect and measure accurately. Table 1 provides further descriptive statistics of the sample. The average respondent is female, aged 23 or younger, earns under $20,000 a year, and is studying a subdegree qualification like a diploma, advanced diploma, or associate degree.

A fundamental aspect of financial wellbeing is the overall financial profile of a person or household. However, two people or two households with the same financial situations might perceive their circumstances differently. Perceived financial wellbeing, which consists of stress related to money management as well as feelings of security in one's financial future, in fact, maps to financial wellbeing, as well as to overall subjective well-being (Netemeyer et al., 2018). We apply a the Netemeyer et al. (2018) financial wellbeing framework (as described in Fig. 1), given by

$$
\begin{aligned}
FINSAT_i = \alpha_i + &\beta_1 CURRENT\ MONEY\ MANAGEMENT\ STRESS \\
+ &\beta_2 FUTURE\ EXPECTATIONS + \beta_3 CONTROL \\
+ &\beta_4 FINANCIAL\ LITERACY + \mu_i
\end{aligned}
$$

where, *CURRENT MONEY MANAGEMENT STRESS* is a set of variables used to describe students' current money management circumstances. The framework by Netemeyer et al. (2018) suggests that being late or making minimum payments on bills and credit cards, lack of self-control, materialism, and perceived financial self-efficacy are antecedents of current money management stress. We explore the relevance of a variety of indicators of current money management stress offered in the survey, and narrow down variables for inclusion in the regression through factor analysis. We include the variables in the analysis that are presented in Table 2.

Table 1　Descriptive statistics

Set of personal factors		Proportion (%)	Mean	SD
What is your gender?	GENDER		0.63	0.48
0– Male		37.00		
1– Female		63.00		
What age category are you in?	AGEC		1.58	1.16
1– 23 or younger		52.05		
2– 24 to 29		24.38		
3– 30 to 39		16.44		
4– 40 to 49		4.38		
5– 50 to 59		2.19		
6– 60 or over		0.55		
What is your current annual income, including paid work, government benefits and other financial support?	INCOME		4.05	2.40
1– Above $100,000		1.67		
2– $80,000–$99,999		3.57		
3– $60,000–$79,999		4.28		
4– $40,000–$59,999		8.80		
5– $20,000–$39,999		20.23		
6– $1–$19,999		35.71		
7– $0		4.76		
What type of degree are you currently pursuing?	EDU		3.31	0.66
1– Preparation program		1.57		
2– Diploma/Advanced Diploma/ Associate degree		70.08		
3– Bachelor degree		23.62		
4– Postgraduate degree		3.94		
5– PhD		0.79		

An investigation of the descriptive statistics shows that paying bills is a problem for students. Over 50% of students regularly make only the minimum monthly payment on their credit cards or pay nothing (CCPAY) and find it difficult to cover expenses and pay bills (BILLS). A slightly lower proportion (43%), indicate that it is difficult to come up with $500 to cover emergency expenses (EMG500). These variables are coded into binary variables where 1 is equal to higher levels of financial stress, and an inverse relationship with financial wellbeing is predicted.

Lack of self-control is proxied by two variables, USEDEBT and SPENDMORE. Concerningly, 12.88% of respondents say they use debt so they do not miss out on student experiences, and 12.07% say they regularly spend more than they have by using credit or borrowing. The responses are coded so that a higher level equates to lacking self-control that is predicted to have an inverse relationship with financial wellbeing.

The factor analysis for a set of questions relating to materialism showed that MATIMP and MATHAP had the highest loadings on the first factor. The descriptive statistics are interesting. Just under 14% of respondents indicate that acquiring material possessions is an important achievement, while a much larger cohort (49.26%) indicate that they would be happier if they could afford to buy more things. No doubt the latter is representative of the constrained budgets of university students. A higher response level is expected to be associated with an inverse relationship with financial wellbeing.

Table 2 Current money management stress descriptive statistics

Current money management stress		Proportion (%)	Mean	SD
Late minimum payments:				
When you get a credit card or other bill, do you usually:	*CCPAY*		0.48	0.50
1– Make the minimum monthly payment/pay more than the minimum, sometimes pay nothing or miss the payment date		52.05		
0– Pay the full balance/someone else pays my bill		47.95		
In a typical month, how difficult is it for you to do the following:				
To cover your expenses and pay all your bills?	*BILLS*		0.50	0.50
1– Always/often/sometimes		50.26		
0– Rarely/never		49.74		
To come up with $500 to cover emergency expenses?	*EMG500*		0.57	0.50
1– Always/often/sometimes		43.43		
0– Rarely/never		56.57		
Lack of self-control:				
I use debt so I do not miss out on "normal" student experiences	*USEDEBT*		1.60	0.71
1– Does not describe me		52.53		
2– Describes me very little/somewhat describes me		34.60		
3– Describes me very well/describes me completely		12.88		
Regularly spend more than I have by using credit or borrowing	*SPENDMORE*		1.58	0.70
1– Does not describe me		54.43		
2– Describes me very little/somewhat describes me		33.50		
3– Describes me very well/describes me completely		12.07		
Materialism:				
Some of the most important achievements in life include acquiring material possessions.	*MATIMP*		1.81	0.66
1– Does not describe me		32.68		
2– Describes me very little/somewhat describes me		53.41		
3– Describes me very well/describes me completely		13.90		
I'd be happier if I could afford to buy more things.	*MATHAP*		2.41	0.64
1– Does not describe me		8.37		
2– Describes me very little/somewhat describes me		42.36		
3– Describes me very well/describes me completely		49.26		
Perceived financial self-efficacy.				
I feel stressed about my personal finances in general.	*FINSTRESS*		2.44	0.68
1– Does not describe me		7.33		
2– Describes me very little/somewhat describes me		41.08		
3– Describes me very well/describes me completely		51.59		
I am confident I can manage my finances	*CONF*		2.55	0.56
1– Does not describe me		3.37		
2– Describes me very little/somewhat describes me		38.46		
3– Describes me very well/describes me completely		58.17		

Perceived financial self-efficacy is related to control over one's financial situation. Two variables are included as proxies: *FINSTRESS* and *CONF*. Alarmingly, only 7.33% of respondents indicate that they do not feel stressed about their personal finances. Responses to the question regarding how confident they feel about managing their finances is contradictory. Only 3.37% of respondents say that they do not feel confident, meaning that most of the population has some level of confidence with managing their finances. We expect a negative coefficient for *FINSTRESS* and a positive coefficient for *CONF*.

Table 3   Future expectations descriptive statistics

Future expectations		Proportion (%)	Mean	*SD*
Positive financial behaviors				
I add to my savings on a regular basis.	*PSAV*		2.31	0.72
1– Does not describe me		15.20		
2– Describes me very little/somewhat describes me		38.48		
3– Describes me very well/describes me completely		46.32		
I plan ahead for major purchases.	*PPLAN*		2.54	0.60
1– Does not describe me		5.31		
2– Describes me very little/somewhat describes me		35.75		
3– Describes me very well/describes me completely		58.94		
Willingness to take investment risks				
Which of the following statements comes closest to describing the amount of financial risk that you are willing to take with your spare cash?	*FRISK*		2.40	1.03
That is, cash used for savings or investment.				
1– I never have any spare cash		20.14		
2– I am not willing to take any financial risks		36.93		
3– I take average financial risks expecting average returns		29.26		
4– I take above-average financial risks expecting to earn above-average returns		10.31		42.93
5- I take substantial financial risks expecting to earn substantial returns		3.36		
Plan for money long-term				
In planning for saving and spending, which of the time periods are most important?	*PLAN*		3.53	1.20
1– Longer than 10 years		5.05		
2– The next 5 to 10 years		15.14		
3– The next few years		30.77		
4– The next year		19.71		
5– The next few months		29.33		

FUTURE EXPECTATIONS is a set of variables used to describe the student's behaviors that are likely to lead to a positive financial outcome. The framework by Netemeyer et al. (2018) suggests that perceived financial self-efficacy, positive financial behaviours, willingness to take investment risks and planning for the long term are antecedents for expected future financial security. We consider responses to several questions about the future that are pertinent to students as proxy for future expectations, as described in Table 3.

Two variables that serve as proxy for positive financial behaviours were selected from a set of questions based on factor analysis: *PSAV* and *PPLAN*. Regularly adding to savings is identified by 46.32% of respondents and 58.64% plan ahead for major purchases. Higher scores are predicted to positively relate to financial wellbeing.

The highest response to a single category for willingness to take financial risks is "I am not willing to take any financial risks" (36.93%). However, 42.93% of respondents did choose a category of willingness to take financial risks to various degrees. A high response is expected to relate positively to financial wellbeing.

Finally, planning for the long term is represented by *PLAN*. The longer the time period selected, the more positive an impact on financial wellbeing. While 29.33% of students are only planning for the next few months, a large portion (70.67%) of them are looking years ahead.

Table 4 Financial literacy descriptive statistics

Financial literacy		Proportion (%)	Mean	SD
If you invested $100 today and the interest rate was 2% per year your bank account balance after five years would be exactly $102	*FINLC*	2.38	1.05	
3 No		70.95		
2 Yes		6.19		
1 Unsure		12.62		
0 Don't care		10.24		
After 1 year you would be able to buy more than today if you invested $100 in your bank account today at an interest rate of 1% per year when inflation is 2% per year	*FINLI*		1.94	1.10
3 No		45.71		
2 Yes		14.29		
1 Unsure		27.86		
0 Don't care		12.14		
Buying shares in a single company usually provides a safer return than buying units in a managed share fund	*FINLD*		1.63	1.07
3 No		34.29		
2 Yes		5.48		
1 Unsure		49.29		
0 Don't care		10.95		
Financial literacy score	*FINLITSCORE*		1.51	1.10
0– 0 correct		23.57		
1– 1 correct		25.95		
2– 2 correct		26.43		
3– All correct		24.05		

CONTROL is a set of constant personal characteristics, including demographics, socioeconomic status, and financial literacy. Studies show that gender, income, education, age, and financial literacy are related to financial outcomes (Lusardi & Mitchell, 2011). The descriptive statistics of *GENDER*, *AGEC*, *INCOME*, and *EDU* are presented previously in Table 1. Table 4 provides detailed information about the financial literacy variable(s). As financial literacy is an assessment of objective knowledge of financial concepts, represented by responses to the "big three" questions on compound interest, inflation and diversification, it is included as a control and not a predictive variable so as not to confuse the constructs with a correlation with financial literacy.

The responses to the three financial literacy questions in Table 4 are of interest. "No" is the correct answer for all three questions. Students generally do well on the first question regarding compound interest (*FINLC*), with 70.95% of respondents correct. However, only 45.71% of students responded correctly for the second question on inflation (*FINLI*) and 34.29% were correct for the third question on diversification (*FINLD*). Respondents to this survey underperform the general population, measured by responses to the same questions in the Household, Income, and Labor Dynamics in Australia (HILDA) survey (Wilkins, 2018). For comparison purposes, 85.5% of the Australian population select the correct answer for the compound interest question, 69.8% for the inflation question, and 74.9% for the diversification question (Wilkins, 2018). We sum the responses to create a single financial literacy score (*FINLITSCORE*). Those with a score of 3 responded correctly to all three questions, which is just under a quarter of respondents (24.05%).
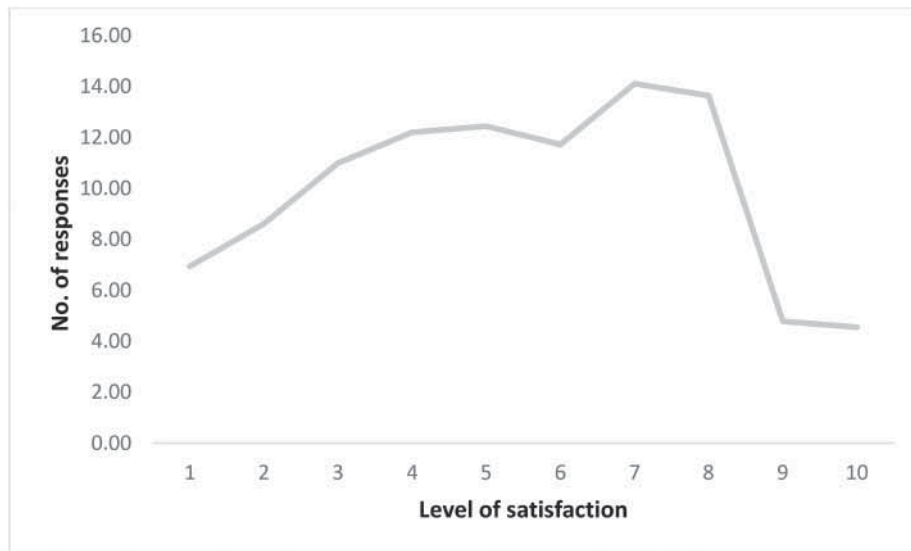
Fig. 2. Distribution of Satisfaction with Financial Situation, where 10 is very satisfied.

Finally, the dependent variable of interest is *FINSAT*. *FINSAT* is the response to "On a scale of 1 to 10, with 10 being totally satisfied, all things considered, how satisfied are you with your financial situation?" Fig. 2 provides the distribution of responses. The mean is 5.35 (SD = 2.48), indicating that overall respondents are more satisfied than not with their financial situation. Due to the ordered nature of this variable, we employ an ordered logit model for analysis. This analytical technique is appropriate as the dependent variable is discrete (that is, can only take the values of 1 through 10) and the values in each category have a meaningful sequential order (West & Worthington, 2014). The ordered logit model estimates an underlying score as a linear function of the independent variables and a set of cut-points (Cameron & Trivedi, 2009), and the probability of observing outcome *i* corresponds to the probability that the estimated linear function plus random error is within the range of the cut-points estimated for the outcome:

$$\Pr(outcome_j = i) = \Pr(k_{i-1} < \beta_i x_{ij} + \beta_2 x_{2j} + \ldots + \beta_k x_{kj} + u_j \leq k_i)$$

where u_j is logistically distributed in the ordered logit, x_{kj} is a vector of control variables with estimated coefficients $\beta_1, \beta_2, \ldots \beta_k$ and cut-points $k_1, k_2, \ldots k_{k-1}$, where k is the number of possible outcomes, k_0 is taken as $-\infty$, and k_k is taken as $+\infty$. The estimated coefficients β and the cut-point parameters are obtained using maximum likelihood methods. The sign of the estimated coefficients can be immediately interpreted as determining whether the dependent variable increases with the independent variables (Cameron & Trivedi, 2009).

4. Results

Table 5 provides the odds ratios and standard errors of eight ordered logit regressions. The *F*-tests for all models rejected the null hypothesis that all slope coefficients are zero at the 0.001 level, implying that they are appropriate for predicting financial wellbeing. The eight models are variants on the financial wellbeing framework and omit sets of variables to

Table 5   Ordered logit results for financial wellbeing

Parameter	Expected sign	1 Odds ratio	2 Odds ratio	3 Odds ratio	4 Odds ratio	5 Odds ratio	6 Odds ratio	7 Odds ratio	8 Odds ratio
CCPAY	−	0.666		1.220	1.340		0.709		
		0.277		0.562	0.625		0.298		
BILLS	−	0.595		0.670	0.620		0.572		
		0.245		0.294	0.275		0.237		
EMG500	−	0.240***		0.289**	0.303**		0.248***		
		0.105		0.133	0.139		0.109		
USEDEBT	−	1.563*		1.606*	1.698*		1.604*		
		0.418		0.442	0.472		0.431		
SPENDMORE	−	0.500*		0.482**	0.479**		0.502**		
		0.141		0.143	0.141		0.141		
MATIMP	−	2.519**		2.296**	2.290**		2.519*		
		0.801		0.777	0.778		0.800		
MATHAP	−	0.717*		0.700	0.697		0.717*		
		0.208		0.211	0.211		0.208		
FINSTRESS	−	0.620**		0.740	0.737		0.621**		
		0.208		0.265	0.261		0.207		
CONF	+	1.318		1.561	1.563		1.321		
		0.419		0.572	0.574		0.421		
PSAV	+		2.046***	1.444	1.502			2.054***	
			0.306	0.436	0.453			0.307	
PPLAN	+		1.355*	0.991	0.963			1.352*	
			0.229	0.324	0.316			0.229	
FRISK	+		1.816***	1.576**	1.526**			1.795***	
			0.190	0.311	0.302			0.191	
PLAN	+		0.755**	0.824	0.829			0.758**	
			0.061	0.126	0.127			0.062	
GENDER		1.384	1.220	1.840	2.188		1.832	1.259	0.957

Table 5   (Continued)

Parameter	Expected sign	1 Odds ratio	2 Odds ratio	3 Odds ratio	4 Odds ratio	5 Odds ratio	6 Odds ratio	7 Odds ratio	8 Odds ratio
		0.519	0.263	0.720	0.905		0.706	0.279	0.201
AGEC		0.668	0.871	0.804	0.781 *		0.807 **	0.865	0.842 *
		0.110	0.077	0.123	0.122		0.119	0.077	0.076
INCOME		0.743 *	0.922 *	0.866 *	0.864		0.855 **	0.920 *	0.927 *
		0.089	0.041	0.084	0.081		0.080	0.041	0.041
EDU		1.023	1.198	0.983	0.926		0.922	1.186	1.458 **
		0.236	0.175	0.218	0.210		0.202	0.175	0.228
FINLITSCORE	+				1.299	1.171 **	1.177	1.059	1.193 *
					0.256	0.094	0.218	0.102	0.110
Pseudo R^2		0.137	0.083	0.176	0.172	0.002	0.138	0.083	0.010
LR χ^2		79.07 ***	135.78 ***	90.58 ***	95.63 ***	0.05 *	79.85 ***	136.1 ***	16.27 *

Notes: Models specified as follows:

1   CURRENT MONEY MANAGEMENT STRESS
2
3   CURRENT MONEY MANAGEMENT STRESS   + FUTURE EXPECTATIONS
4   CURRENT MONEY MANAGEMENT STRESS   + FUTURE EXPECTATIONS   + CONTROL   + FINANCIAL LITERACY
5   + FUTURE EXPECTATIONS   + FINANCIAL LITERACY
6   CURRENT MONEY MANAGEMENT STRESS   + CONTROL   + FINANCIAL LITERACY
7   + CONTROL   + FINANCIAL LITERACY
8   CURRENT MONEY MANAGEMENT STRESS   + FUTURE EXPECTATIONS   + CONTROL   + FINANCIAL LITERACY

test for predictive power. The signs of the odds ratio indicate the effect on financial wellbeing. If the estimate is positive, then an increase in the dependent variable necessarily decreases the probability of being in the lowest financial wellbeing category and increases the probability of being in the highest financial wellbeing category. A summary of the models tested is provided in Table 5.

Comparison of the pseudo R^2 shows the model with the most explanatory power is Model 3 (0.176), that includes all variables except FINLITSCORE. All coefficients are positive in this model, with the significant factors including *EMG500*, *USEDEBT*, *SPENDMORE* in the set of current money management stress factors, *MATIMP* and *FRISK* in the future expectations set, and no significant factors in the set of control variables. Within the set of current money management stress variables, *EMG500* is highly significant and positive across all four models it is included in. Positive responses to this binary variable indicate issues with accessing emergency funds, so the positive relationship with financial wellbeing is puzzling as we were expecting a negative association. Other variables like *USEDEBT*, *SPENDMORE*, *MATIMP*, *MATHAP*, and *FINSTRESS* vary in significance across models but were all positive, when negative signs were expected. We draw the conclusion that current financial stress, while a significant determinant of financial wellbeing, is not inversely related. Therefore, students under weigh financial stress when asked to quantify their level of financial wellbeing, suggesting that other factors are more important.

We sense what other factors are more important when examining the set of future expectations indicators. For the set of future expectations, *PSAV*, *PPLAN*, *FRISK*, and *PLAN* had very significant positive coefficients when the current money management stress variables were excluded from the model, as well as strong coefficients. When the current money management stress variables were included (Models 3 and 4), all but *FRISK* lost significance. We infer from this that people who are willing to take financial risk have an innate understanding of the time value of money that translates into confidence in their financial futures.

Finally, of the set of personal attributes, *INCOME* is significant in five out of eight models, and *AGEC* is significant in three out of eight models. This makes logical sense, as higher incomes, which are associated with being older, overcome barriers to perceived wellbeing by facilitating choice and lifestyle purchases. For example, higher incomes afford people to both purchase medicine and groceries, while people living hand-to-mouth have to trade-off between necessities. This finding contributes to discussions that a good income affords many benefits: financial stability, enables future planning, facilitates acting on money beliefs, and practice making financial decisions. Interestingly, *FINLITSCORE* is only significant in Model 5 (as the only factor in the model) and Model 8 (only includes control variables). Both of these models have low explanatory power.

Given the focus on financial literacy in the hypothesis, we conducted further tests of the *FINLITSCORE* as the dependent variable. Results of the ordered logit model, marginal effects of the highest level (Outcome 3), and an ordered logit retaining a sample of those that scored the highest level are provided in Table 6. These models answer questions as to what factors are likely to contribute to having a high financial literacy score. The marginal effects of the highest outcome provide more consistency with our original expectations. *CCPAY* and *USEDEBT* were significant with negative coefficients. People with higher levels of financial literacy, therefore, pay their bills on time and do not use debt. *FRISK* is also

Table 6   Ordered logit results for financial literacy score

Parameter	Ologit		Marginal effects	
	Odds ratio		Odds ratio	
CCPAY	0.488		−0.118	*
	0.229		0.077	
BILLS	1.791		0.096	
	0.779		0.072	
EMG500	0.756		−0.046	
	0.260		0.079	
USEDEBT	0.545	*	−0.100	**
	0.159		0.047	
SPENDMORE	1.073		0.012	
	0.313		0.048	
MATIMP	0.952		−0.008	
	0.351		0.061	
MATHAP	0.974		−0.004	
	0.293		0.049	
FINSTRESS	0.917		−0.014	
	0.347		0.062	
CONF	1.362		0.051	
	0.501		0.060	
PSAV	0.911		−0.015	
	0.281		0.051	
PPLAN	0.824		−0.032	
	0.286		0.057	
FRISK	1.452	*	0.061	*
	0.287		0.032	
PLAN	0.919		−0.014	
	0.138		0.025	
GENDER	0.404	**	−0.149	**
	0.162		0.063	
AGEC	1.262		0.038	
	0.203		0.026	
INCOME	1.007		0.001	
	0.101		0.017	
EDU	1.472		0.064	
	0.352		0.039	
Pseudo R^2	0.128			
LR χ^2	43.47	**		

positive and significant, providing further evidence that people willing to take financial risk have a good level of financial knowledge. *GENDER* has a negative association that is well supported by the literature that females score less well on questions of financial literacy than men.

Our analysis concludes that financial literacy and financial wellbeing are not related constructs. However, we do find that good money habits like saving and planning contribute to higher levels of financial wellbeing, but mostly when current money management circumstances are excluded. When both data sets are included together, current financial stress dominates as a determinant of financial wellbeing. Importantly though, current financial stress is not the single determinant of financial wellbeing, and respondents seem to include

their preparedness for the future into their level of financial wellbeing. This is especially salient for university students who expect their level of income to increase in the future as a result of graduating with a university qualification and ability to commit to working longer hours once their studies are completed.

These findings contribute to the literature on financial wellbeing and the application of the Netemeyer et al. (2018) financial wellbeing framework, as specified and with the limits of the data. For educators and practitioners, we highlight the importance of good financial savings habits, financial risk-taking and income in achieving higher levels of financial wellbeing in clients and students. Finally we note that these findings may be context specific, as students experience low and irregular incomes, which can lead to increased vulnerability to external shocks and uncertainty. However, many other workers experience irregular incomes due to the rise of the gig economy. Proponents of financial literacy education should persevere, recognizing the limits to transferring knowledge and set evidence-based goals for financial literacy education.

5. Discussion and conclusion

The financial wellbeing of students is of concern to universities both to facilitate learning and to prepare them for future financial decision-making as participants in the economy. As the increase in outstanding student debt and student loan defaults has raised concerns regarding the value of higher education outcomes and the consequences of over-indebtedness for young borrowers (Artavanisa & Karra, 2020; Mueller & Yannelis, 2019), it could further be argued that universities have a moral obligation to support students in managing their finances. Financial literacy education seems an appropriate solution. However, if financial literacy is well proxied by the big three questions, then knowledge alone will not achieve the intended outcome. After all, understanding the concept of compound interest is of little use if living hand-to-mouth or if economic choice is confined due to household arrangement. Therefore, public policy makers and educators that advocate for financial literacy interventions should add strategies for improving incomes to their arsenal. The playing field is not level, government safety nets are often inadequate, and non-participation in education and work can be intergenerational. However, to see more informed financial decision-making and to improve wealth and wellbeing outcomes would benefit many, and these factors are arguably more important.

The findings of this study, while currently limited to one Australian university, provide valuable insights into the financial wellbeing of university students and can be used to inform future actions to specifically improve the wellbeing of university students. The impact of income on student wellbeing and student welfare is significant. Not only does an increase in income contribute to student wellbeing financially, but it may also assist in improving student grades by minimizing stress for those at the lower end of the income scale. While financial literacy education has traditionally been the response to improving university students' financial wellbeing, this study has shown that for students on lower incomes, this this alone will not improve the financial wellbeing of students. A call to action

for more novel approaches to financial wellbeing from both universities and the government that address the needs of students on significantly lower levels of income is needed. This might include universities providing cheaper accommodation and meals for lower income students through subsidies or vouchers or providing more jobs to students on campus. Other initiatives such as collaborating with industry to provide more cadetships, scholarships, and paid internships to students may also be beneficial.

Government welfare policies also need to reconsider the way that income is distributed so that university students are not penalized for furthering their education. For example, in Australia, as it currently stands, a young university student's access to welfare is directly linked to parental income, regardless of whether they remain in the family home or need to relocate to attend university, or in fact whether the parent or parents are even providing financial support to the student. In comparison, a young individual who has completed school but does not attend university is entitled to higher levels of welfare regardless of their parental income or whether they are living at home or not. Innovative reform might include the provision of additional financial assistance to low income university students that is offered in conjunction with financial literacy education, or maybe tax incentives could be introduced for parents and spouses who provide financial support to dependents as they attend university. Further research is needed to investigate the feasibility of such suggestions and extensions of this study at other institutions, along with qualitative studies would assist in realizing the true extent of the impact of low incomes on financial wellbeing of university students.

Acknowledgements

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