

## OVERCONFIDENCE IN FINANCIAL LITERACY: IMPLICATIONS FOR PLANNERS

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### ABSTRACT

Financial literacy of clients is an important consideration for financial planners as it has implications for determining financial capacity. Likewise, overconfidence is also an important concern, given that overconfident clients may indicate they understand advice when in reality they do not. Using an online survey, we gathered data on subjective and objective levels of financial literacy from a sample of university students. We then examined the associations between self-assessed and actual levels of financial literacy with the aim of identifying overconfidence. We find, generally, respondents do not overestimate their financial literacy; however, respondents with English as a second language were significantly more overconfident than other demographic groups. These findings can help planners in identifying clients who may be overconfident in their own financial literacy.

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## Introduction

Financial literacy has been identified as an essential component of sound capital markets as it improves consumer and investor confidence and results in an overall more resilient financial system (ASIC, 2011; Hall, 2008). In Australia, the Government has been promoting the importance of financial literacy for over a decade, and in 2011 established the National Financial Literacy Strategy. On a macro level, the importance and benefits of financial literacy are well understood.

For individuals, improved financial literacy should lead to better financial outcomes, be that less debt management issues (Lusardi and Tufano, 2009), improved investment and wealth management (van Rooij, Kool and Prast, 2007; Capuano and Ramsay, 2011; Hastings and Tejada-Ashton, 2008), or improved retirement savings (Lusardi and Mitchell, 2006). Indeed, even 'rented' knowledge, acquired through the use of a financial planner, can improve financial outcomes (Smith, Finke and Huston, 2012).

This paper adopts a definition of financial literacy as "the ability to make informed judgements and to take effective decisions regarding the use and management of money" (ASIC, 2011, p.12). This definition encompasses basic numeracy as well as understanding of financial concepts necessary to make financial decisions, and also the ability to recognise when one's ability is deficient and there is a need to seek advice from a planner. While there are many impediments to financial literacy, this paper considers overconfidence and its potential to impact on financial outcomes, particularly from financial advice.

There are three main issues to address with overconfidence and financial advice. The first is that overconfident people, by the nature of their bias, are unlikely or reluctant to seek financial advice (Finke, Huston and Winchester, 2011). These people have faith in their own ability to manage their finances. There are still times when overconfident people will seek advice though, which brings us to the second and third issues: curbing overconfident investment behaviour (Statman, Thorley and Vorkink, 2006; Odean, 1999), and overconfidence resulting in a lack of understanding. Both of these issues have implications for a planner fulfilling their best interests duty. In relation to curbing overconfident investment behaviour, a planner would need to convince a client of their overconfidence bias in order to provide appropriate advice. In relation to overconfidence resulting in a lack of understanding, a client needs to be fully informed in order to consent and successfully implement advice. Thus, it is important for planners to be aware of potential overconfidence in their clients so the education component of advice can be managed effectively.

This study has two aims. First, it seeks to identify the prevalence of overconfidence in financial literacy. Second, following previous research which determines characteristics of financial literacy (Atkinson and Messy, 2012), this study will seek to identify if there are demographic characteristics associated with overconfidence. From a sample of university students who took part in an online survey, we find most people can accurately identify their ability in eight areas of financial literacy; however, there are some key differences. This finding demonstrates the importance of planners using both self-rated and objectively-tested means to assess financial literacy of clients, and in addition assess overconfidence. Further, an examination of those who are categorised as overconfident in their financial literacy finds respondents with English as a second language (ESL)

were significantly more likely to be overconfident. This finding will assist planners to identify those clients at most risk of this form of overconfidence, allowing them to take further steps to identify this bias and provide appropriate advice.

The remainder of the paper is structured as follows. First, the relevant literature is discussed. This is followed by the methodology and then the analysis and results. Finally, these findings are discussed in the conclusion.

## Literature Review

Financial planners are obligated to provide advice that is in the best interests of their clients (Corporations Act 2001 (Cth), s. 961B). This duty encompasses not only a duty to act in the client's best interests, but also a duty to provide appropriate advice and prioritise the client's interests. In order to be able to satisfy the best interests duty, planners need to have an accurate understanding of their clients, including their clients' attitudes and financial literacy. Planners need to be confident that clients understand the advice they are being given in order to properly discharge their duties (Teale, 2015).

While there is increasing recognition of the need to assess client's financial literacy in order to effectively explain financial concepts, the process of assessment is more complicated. Atkinson and Messy (2012) note there are several domains of financial literacy, such as managing money or choosing products. In addition, they note that knowledge is only one aspect. How one behaves and their attitudes also impacts on their financial capability (Atkinson and Messy, 2012; Oaten and Cheng, 2007). This study looks at the impact of one such behavioural bias – overconfidence. In particular, overconfidence in one's financial literacy.

Within the behavioural economics and psychological literature (e.g. Kahneman, 2003), overconfidence is seen as stemming from cognitive biases. Individuals tend to use quick and easy heuristics when forming ideas and judgements and then seek and attend to information confirming rather than refuting those ideas. The concern is that overconfidence can lead to faulty decision-making, more so when the knowledge base is also faulty. Overconfidence can also lead to excessive optimism with investors believing that their decisions will lead to better outcomes than are possible. De Bondt (1998), for example, showed that even experienced investors demonstrate these biases, believing that their own stock choices would do better than the broader market and downplaying the impact of diversification and market forces.

While under-confidence may lead to the feeling of stress that comes with money issues, and it could "manifest as apathy, resulting in a poor or suboptimal financial outcome" (Financial Literacy Foundation, 2007, p. 39), over-confidence may lead to individuals not recognising the need to become better informed or seek professional assistance and subsequently may result in poor decisions.

Overconfidence is of particular concern for planners given there are a number of ways it can potentially negatively impact on financial decisions (Porto and Xiao, 2016). There is evidence of behavioural issues where overconfident investors trade more and earn inferior returns (Barber

and Odean, 2001), and that overconfidence can lead investors to underestimate risks and shortcomings of certain investment options (McCannon, Asaad and Wilson, 2016). One of the main concerns for planners, however, is that overconfident clients may believe they possess more knowledge and understanding than they actually do. When a client's self-assessment of their financial literacy is higher than their actual ability, this is termed overconfidence. Similarly, lower self-assessed levels than actual capability indicates under-confidence.

Inaccurate understanding of finance and investing has been shown to drive investing behaviour (McCannon, Asaad and Wilson, 2016). Clients who are overconfident in their financial literacy may therefore pursue higher-level financial advice which perhaps they are not fully capable of comprehending. This can create problems for the efficacy of a financial plan, and could potentially lead to disputes.

There is little research that looks at the difference between individuals' self-assessed and actual financial literacy. Previous research suggests perceived financial literacy has a similar influence on financial behaviour as actual financial literacy (Allgood and Walstad, 2016). In that case a client's self-assessed financial literacy could be a better indicator of how they will approach financial decision-making. However, previous studies have found a discrepancy between survey respondents' self-assessed financial literacy and actual financial literacy (Ali, *et al.* 2014; Lusardi and Mitchell, 2011; Van Rooij, Lusardi and Alessie, 2011).

A further issue is that financial literacy is often considered a control in overcoming certain cognitive biases (Thaler and Benartzi, 2004). For instance, an understanding of the need for implementing a financial plan should prevent status quo bias and inertia. A false judgement on the financial literacy of a client could mean plans are not implemented, or that plans are not suitable for the client.

A final concern is that recent research has shown people who are overconfident in their financial literacy are more likely to be part of a self-managed superannuation fund (Bird, *et al.* 2016). Being a member of a self-managed superannuation fund (SMSF) is a role which brings with it trustee obligations and duties and it is vital that clients have a complete understanding of their role in order for their retirement planning to be effective.

## Methodology

Given the above discussion, we were interested in answering the following research questions: RQ1. What is the extent of overconfidence in financial literacy? And RQ2. What characteristics are associated with overconfidence in financial literacy?

We used an online survey approach to collect data on respondents' financial literacy and demographic information. We constructed the questionnaire to measure both self-assessed and objective measures of financial literacy, as both are necessary in order to measure overconfidence and answer RQ1. Importantly, we asked respondents to self-rate their ability prior to objectively testing their ability, thus avoiding any influence the difficulty of the test question may have on their self-rated ability. Respondents were asked to self-rate their understanding of the following eight

topics: budgeting, saving, managing debt, investing, retirement planning, taxation, insurance, and superannuation.

The challenge of objectively measuring financial literacy means that there is no single question that can be administered to identify whether a person is financially literate. Accordingly, Atkinson and Messy (2011) argue that it is necessary to create a comprehensive set of questions that can directly test levels of knowledge, as well as explore attitudes and financial behaviours. To test actual levels of financial literacy, we asked fourteen questions that test the respondent's actual knowledge of general interest, inflation, investment, budgeting and saving, insurance, superannuation, and taxation knowledge. These questions were drawn from existing studies of financial literacy, including Lusardi and Mitchell's (2006) well-known questions, questions adapted from the Jump\$tart Coalition's report on young adults financial literacy (Mandell, 2008), and others from the ANZ Survey of Adult Financial Literacy (ANZ, 2008) as well as Bateman, *et al.* (2012) and Chardon (2011). A summary of the objective test questions is given below in Table 1.

**Table 1: Operationalisation of financial literacy constructs**

Constructs	Questions	Source
Budgeting, saving, managing debt	1. Compound interest	Lusardi and Mitchell, 2009
	2. Inflation	Lusardi and Mitchell, 2009
	3. Budgeting	Mandell, 2008
	4. Borrowing	Mandell, 2008
	5. Credit card debt	Mandell, 2008
Investing	6. Risky assets	Lusardi and Mitchell, 2009
	7. Long period returns	Bateman, <i>et al.</i> , 2012
Superannuation, retirement planning, and insurance knowledge	8. Performance indicator	ANZ, 2011
	9. Concessional tax rate	Chardon, 2014
	10. Life insurance need	Mandell, 2008
Taxation knowledge	11. Car insurance	Mandell, 2008
	12. Assessable income	Chardon, 2014
	13. Tax payable	Chardon, 2014
	14. Negative gearing	Chardon, 2014

After obtaining ethical clearance, we distributed our survey in mid-2015 via four universities across Australia that agreed to email the survey to their students. While the use of convenience sampling can reduce external validity, we believe results can be generalised to other segments

of the population, not the least because financial behaviours formed during early adulthood will most likely persist (Shim, *et al.* 2010). In addition, we also distributed the survey through student Facebook sites of other universities to extend the coverage. All states are represented in the sample with the exception of the Northern Territory and Tasmania.

A total of 363 complete responses were received to the survey. A large portion of respondents were female (79%) which is a much higher representation than the 50.7 per cent of the general population (ABS, 2017), which could be an indicator of self-response bias. In terms of age, 44 per cent of respondents were over 20 years of age. While a large proportion of respondents live at home (56%), nearly two thirds (67%) are either working full-time, part-time or casually and close to 15 per cent of them had business as the main area of study in university. English as second language accounted only for 11 per cent of the sampled respondents which is lower than the general population of 22.2 per cent (ABS, 2017). A summary of the demographics of the respondents to the survey is provided in Table 2.

**Table 2: Demographics of respondents**

<b>Demographics</b>	<b>Frequency</b>	<b>Per cent % (n=302)</b>
Female	238	79
Indigenous	8	3
20 yrs and above	133	44
Non-English at home	33	11
Paid work	203	67
Studying business	42	14
Living at home	170	56

Analyses included a univariate summary of the measures of self-rated and tested levels of financial literacy, an assessment of the correlation and agreement between those two measures, measuring overconfidence in financial literacy, assessing the effects of a series of demographic predictors on self-rated and tested levels of financial literacy, and assessing those predictors on overconfidence. The statistical package Stata is used and Table 3 summarises all the variables and their definitions in this study.

**Table 3: Definitions of variables in study**

Variable	Definition
female	dummy variable for gender: 0 indicating <i>male</i> and 1 indicating <i>female</i>
indigenous	dummy variable for self-identification of being indigenous Australian: 0 indicating <i>no</i> and 1 indicating <i>yes</i>
above20	dummy variable for being 20 years old or above: 0 indicating <i>no</i> and 1 indicating <i>yes</i>
non_English	dummy variable for speaking a language other than English at home: 0 indicating <i>no</i> and 1 indicating <i>yes</i>
paid_work	dummy variable for doing paid work: 0 indicating <i>no</i> and 1 indicating <i>yes</i>
study_biz	dummy variable for studying business at university: 0 indicating <i>no</i> and 1 indicating <i>yes</i>
self_rate_avg	the average self-rating on the level of understanding of eight aspects of financial literacy (i.e., <i>budgeting, saving, managing debt, investing, retirement planning, taxation, insurance, and superannuation</i> ) each on a five-band Likert scale (i.e., 1 – <i>very low</i> , 2 – <i>low</i> , 3 – <i>fair</i> , 4 – <i>high</i> , and 5 – <i>very high</i> )
test_overall	the total number of correct answers to a panel of 14 quizzes on various aspects of financial literacy
rescaled_test_overall	Rescaled test_overall to a range between 1 and 5: $\text{rescaled\_test\_overall} = 4 \times \text{test\_overall} / 14 + 1$
overconfidence	overconfidence in financial literacy: $\text{overconfidence} = \text{self\_rate\_avg} - \text{rescaled\_test\_overall}$

### Analysis and Results

*Self-rated* financial literacy is measured by the average self-ratings of understanding for eight aspects of financial literacy (*self\_rate\_avg*). *Tested* level of financial literacy is measured by the total number of correct answers to the 14 questions on financial literacy (*test\_overall*). The survey received 363 complete responses to the eight self-ratings and 316 complete responses to the 14 test questions.

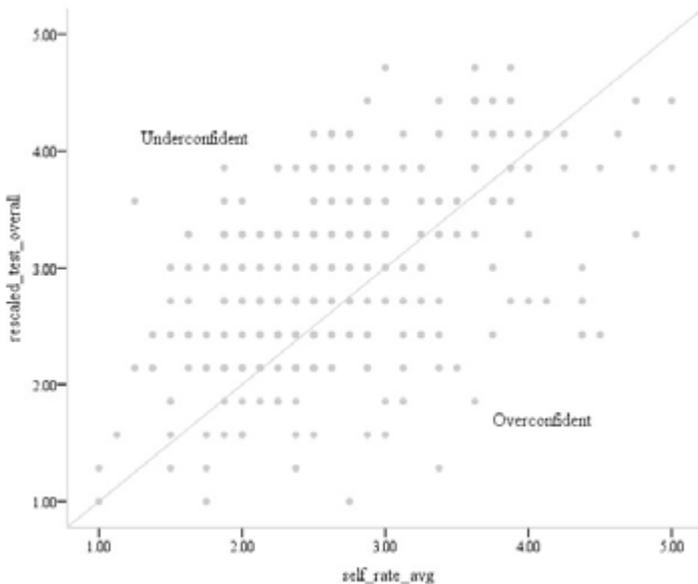
As shown in the first two rows of Table 4, the sample has an average *self-rated* level of financial literacy of 2.68 on a five-band Likert scale from *very low* (1) to *very high* (5); and on average the respondents correctly answered nearly half of the 14 *tested* questions. Both measures were close to normal distributions.

**Table 4: Numerical summary of self-rated and tested levels of financial literacy in sample**

Variable	N	M	Mdn	SD	Skew	Kurt	Min	Max	Q1	Q3
self_rate_avg	363	2.68	2.50	.79	.62	.19	1.00	5.00	2.13	3.13
test_overall	316	6.70	7.00	2.75	.02	-.49	.00	13.00	5.00	9.00
Overconfidence	316	-.23	-.25	.80	.35	.15	-2.32	2.09	-.79	.23

As can be seen in the scatter plot in Figure 1, self-rated and tested levels of financial literacy demonstrate a moderate positive linear correlation with a Pearson's  $r$  of .48 ( $p < .001$ ). However, a strong positive correlation between two quantitative measures does not necessarily mean a high level of agreement (Bland and Altman, 1986).

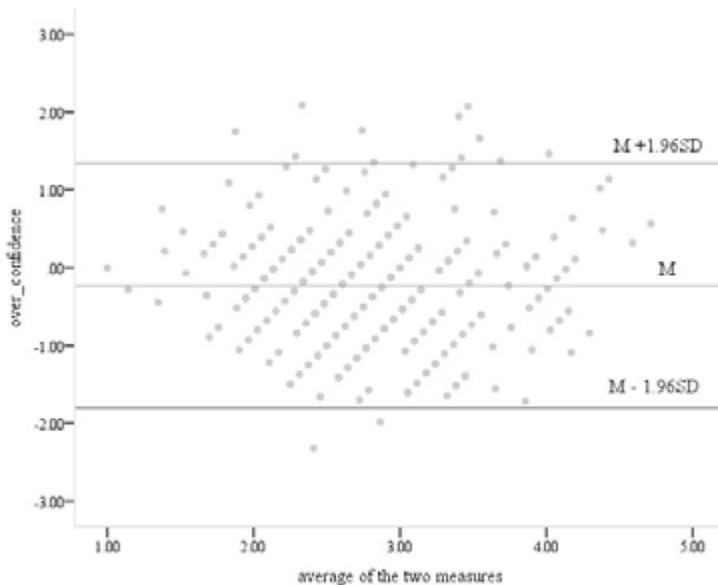
**Figure 1. Scatter plot of self-rated and tested levels of financial literacy**



To assess the agreement between self-rated and tested levels of financial literacy, the number of correct answers to the 14 test questions (test\_overall) is rescaled to the average of self-ratings of understanding for the eight aspects of financial literacy (self\_rate\_avg). The rescaling calculation can be found in the variable summary in Table 3. In the scatter plot in Figure 1, points close to the 45-degree line represent respondents showing fair confidence in financial literacy, whereas points far below and above the 45-degree line respectively indicate overconfidence and under-confidence.

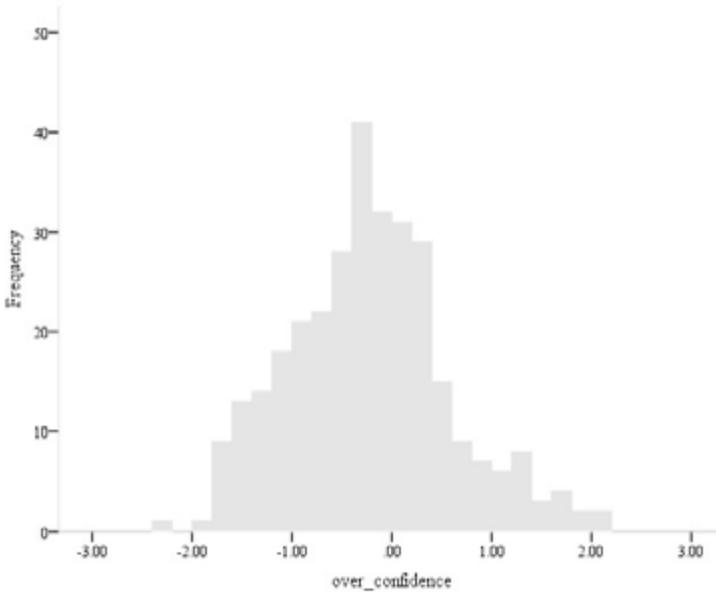
A Bland–Altman (Bland and Altman, 1986; 1999) plot (Figure 2) is constructed to assess the agreement between self-rated (*self\_rate\_avg*) and tested (*rescaled\_test\_overall*) levels of financial literacy. On average the two measures are statistically different at the one per cent level ( $M_{diff} = -.231$ ,  $t(315) = -5.128$ ,  $p < .001$ , 95% CI =  $-.320, -.142$ ). It is 95 per cent accurate to conclude that the population's average self-rated level of financial literacy is slightly lower than its average tested level. Results of a simple linear regression of the difference between the two measures on their average show no sign of proportional bias ( $B = -.016$ ,  $t(314) = -.236$ ,  $p = .814$ ).

**Figure 2. Bland–Altman plot of self-rated and tested levels of financial literacy**



The difference between self-rated (*self\_rate\_avg*) and tested (*rescaled\_test\_overall*) levels of financial literacy can be a measure of overconfidence, where zero means perfect fair confidence, positive values indicate overconfidence, and negative values indicates under-confidence. In answering RQ1, most respondents in the sample tend to be slightly under-confident, while some are extremely overconfident (Table 4). Therefore, the distribution is slightly skewed to the left (Figure 3).

**Figure 3. Histogram of overconfidence in financial literacy**



To answer RQ2, we assess the effects of a series of demographic predictors on self-rated and tested levels of financial literacy by estimating models for Seemingly Unrelated Regression (SUR) (Zellner, 1962). The SUR approach is preferred to separate ordinary least squares (OLS) regressions on both of the financial literacy measures because the disturbance terms of these two equations are highly likely to be contemporaneously correlated (i.e., unconsidered factors that influence the disturbance term in the self-rated financial literacy equation probably influence the disturbance term in the tested financial literacy equation). Ignoring this contemporaneous correlation and estimating these equations separately leads to inefficient estimates of the coefficients. SUR takes the covariance structure of the residuals into account and efficiently estimates both equations simultaneously with a generalized least squares (GLS) estimator. Further, cross-equation restrictions and testings can be performed with the simultaneous estimation of SUR.

Table 5 presents the results of the SUR models. The sample size is 302 with listwise deletion of missing data. The unconstrained model estimates different sets of regression coefficients for two dependent variables. Two equations' residuals are significantly moderately correlated. When the regression coefficients of all six predictors are constrained to be equal across two equations, the test result is statistically significant at the five per cent level ( $\chi^2_{(6)} = 15.22, p = .019$ ), suggesting that not all of the regression coefficients are the same across two equations. With a series of further tests, it is found that only the coefficient of non\_English is significantly different between two equations. Therefore, the final constrained model is estimated with all predictors constrained except for

non\_English and the constraints are not statistically significant ( $\chi^2_{(5)} = 7.09, p = .214$ ). Thus, the results of the final model in Table 5 confirms that: compared to males, females on average have a lower level of both self-rated and tested financial literacy; self-identified indigenous students have a marginally significant higher level of both financial literacy measures, and so do students doing paid work; and students of 20 or more years of age have a significantly higher level of the two measures. Whether students are studying business does not have a significant effect on either measure. Students speaking a language other than English perceive themselves to have a higher level of financial literacy; however, their tested financial literacy is not significantly different from their peers.

**Table 5: Seemingly unrelated regressions of self-rated and tested levels of financial literacy**

	Unconstrained model				Constrained model			
	self_rate_avg	p	rescaled_test_overall	p	self_rate_avg	p	rescaled_test_overall	p
female	-.454	<.001	-.594	<.001	-.526	<.001	-.526	<.001
indigenous	.347	.193	.409	.117	.379	.090	.379	.090
above20	.195	.024	.268	.002	.233	.001	.233	.001
non_English	.299	.030	-.168	.214	.268	.052	-.139	.304
study_biz	.057	.644	-.023	.849	.016	.880	.016	.880
paid_work	.241	.009	.055	.550	.145	.064	.145	.064
constant	2.748	<.001	3.251	<.001	2.86	<.001	3.14	<.001
$\chi^2_{(d.f.)}, p$	35.37(6)	<.001	46.28(6)	<.001	55.22(6)	<.001	50.67(6)	<.001
R-squared	.105		.133		.099		.128	
residuals <i>r, p</i>	.441, <.001				.432, <.001			
joint constraints test:	n.a.				7.09(5), .214			
$\chi^2_{(d.f.)}, p$								

A multiple linear regression model is estimated to assess the effects of a series of predictors on overconfidence. Table 6 presents the estimates of regression coefficients. Residual analysis suggests that the assumptions of normality and constant variance of the error are met in this sample. The model has overall significance ( $F(6, 295) = 2.477, p=.024$ ) at the five per cent level. The regression coefficient estimates and their *p* values indicate that speaking a

non-English language at home and doing paid work have statistically significant positive effects on overconfidence in financial literacy. This sample also suggests that females, non-indigenous people, people under 20, and business students tend to be more overconfident in financial literacy. However, the evidence of those effects is not found to be statistically significant.

The multiple linear regression only examines the effects of predictors on the conditional mean of the dependent variable. Quantile regression (Koenker and Hallock, 2001) is employed to conduct a more comprehensive assessment of the predictors' effects on overconfidence of financial literacy across the distribution of the dependent variables. The results show that the effects of all predictors are quite consistent across the spectrum of overconfidence. The Breusch-Pagan test also confirms the homoscedasticity ( $\chi^2_{(1)} = .21, p = .649$ ).

**Table 6: Regression coefficient estimates**

	<b>B</b>	$\beta$	<b>t</b>	<b>p</b>
Constant	-.504	-	-4.090	<.001***
female	.139	.071	1.230	.220
Indigenous	-.063	-.013	-.222	.824
above20	-.073	-.045	-.792	.429
non-English	.466	.184	3.193	.002***
paid_work	.187	.111	1.897	.059*
study_biz	.080	.035	.612	.541

\* significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level

## Conclusion

This study has proposed that while assessing financial literacy of clients is important for financial planners, they must also give consideration to the self-rated versus actual financial literacy. There is evidence that self-rated financial literacy has an influence on financial behaviour (Allgood and Walstad, 2016), so it should be considered equally as important as actual financial literacy. Differences between self-assessed and actual financial literacy can manifest as overconfidence or under-confidence, and while both potentially have negative behavioural and knowledge-based consequences for financial capacity, this study has focused on overconfidence given the risks for financial planners in ensuring they satisfy their best interests duty as discussed earlier.

In answering RQ1, we find that overall the sample was slightly under-confident in its financial literacy. In terms of characteristics and answering RQ2, the main finding is that respondents who speak a language other than English at home are more likely to be overconfident in their financial literacy in that they self-rate their understanding higher than their actual tested understanding. In addition, we find females have both lower self-rated and actual financial literacy consistent with

prior research (Atkinson and Messy, 2012), while indigenous students, students doing paid work, and students over 20 all have marginally higher self-rated and actual financial literacy. These findings underscore the importance of planners using both self-rated and objectives measures when determining a client's level of financial literacy.

Interestingly, we did not find a significant difference for gender and overconfidence for the student sample. Prior studies have found men are more overconfident (Barber and Odean, 2001; Croson and Gneezy, 2009). This lack of finding could result from the low proportion of males in the sample reducing the statistical power to identify the difference between gender groups, or it could be the sample being university educated. Atkinson and Messy (2012) find that generally financial literacy increases with education; it could be that perhaps overconfidence is tempered by education. Further research could therefore explore the extent to which completion of tertiary education influences overconfidence in financial matters.

The main limitation in this study is the proportion of female respondents. While this may influence our findings, we believe that given males are more prone to overconfidence than females (Barber and Odean, 2001; Croson and Gneezy, 2009) our findings would only be stronger with a more balanced gender breakdown. In addition, the study is limited in generalisability given the results are drawn from a sample of university students. Future research could ascertain if these findings hold for other samples.

A final area for future research is to seek to understand the nature of overconfidence with those who speak a language other than English at home to determine if this difference stems from a less nuanced understanding of the language, particularly in the test questions, or from cultural differences. It would also be interesting to explore if there are other significant differences for financial planning advice and implementation between English speakers and those that do not speak English at home.

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