

Financial capability, income and psychological wellbeing

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Non-technical summary

We use data from the British Household Panel Survey (BHPS) to construct a measure of financial capability and then investigate the relative impacts of financial capability and income on psychological health. Financial capability is conceptually different from income or material wellbeing and reflects people's ability to control their finances, make appropriate financial decisions, understand how to manage credit and debt and identify appropriate products and services. Regardless of how much money they have, people require financial management skills. Over the last three decades credit has become more widely available, responsibility for provision in retirement has increasingly fallen onto individuals and the costs of higher education are increasingly borne by students. Therefore the consequences of a lack of financial capability are becoming progressively more serious.

We construct a financial capability measure from variables in the BHPS that relate directly to people's abilities to make ends meet and their money management. This rests on the hypothesis that there is some underlying factor (financial capability) which is better captured by reviewing a range of indicators of a person's current financial situation than by any of the specific items of information individually, similar to how researchers construct deprivation measures using lifestyle indicators. We extend existing research by (i) distinguishing between financial capability, income and economic resources within a nationally representative sample of adults in Britain; and (ii) assessing the impact of financial capability on psychological health over and above the impacts of income and economic wellbeing more generally.

We find that for both men and women, low financial capability has significant and substantial psychological costs over and above those associated with low income or deprivation. For men the size of this effect is similar to that associated with being unemployed. For women the size of the effect is similar in magnitude to that of being divorced. High financial capability is associated with higher levels of psychological health for both men and women. This suggests that improving people's financial management skills would have substantial effects on stress-related illnesses and the outcomes associated with such problems, and therefore have lasting benefits for individuals and the wider economy. Furthermore, low financial capability exacerbates the psychological costs associated with being divorced or unemployed and of having low income. An implication is that by improving financial capability policy makers can reduce the psychological impacts of experiencing such life events. Therefore as well as the expected benefits of reducing problem debt, welfare dependency and poverty and increasing savings, our results indicate that improving financial capability will also have wider impacts through improving psychological health. The sizes of these improvements in psychological health dwarf those associated with raising household incomes, which indicates that the ability to manage income is more important than the level of income in determining psychological health.

Our research provides suggestive new evidence of the effects of financial capability on psychological health in Britain. The impacts of having low financial capability are large and therefore financial capability can be considered to be an important determinant of mental disorder.

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Abstract

We examine whether financial capability has impacts on psychological health independent of income and financial resources more generally using a nationally representative survey. British Household Panel Survey data are used to construct a measure of financial capability, which we relate to respondents' psychological health using the 12-item General Health Questionnaire. We find that financial capability has significant and substantial effects on psychological health over and above those associated with income and material wellbeing more generally. The sizes of these impacts are considerably larger than those associated with changes in household income. Furthermore having low financial capability exacerbates the psychological costs associated with unemployment and divorce.

Keywords: financial capability; psychological health; wellbeing; panel data; BHPS.

JEL classification: C23 I32 D14

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1. Introduction

Policy makers in Britain are increasingly interested in financial capability. Plans for a National Strategy for Financial Capability were introduced in 2003 (FSA 2003), culminating in a five year strategy '*Delivering Change*' published in 2006 (FSA 2006a). In 2007 the long-term aims to improve financial capability were published, citing lasting benefits for individuals and the wider economy (HM Treasury 2007). In a recent review of the primary school curriculum, the teaching of financial capability skills to children was endorsed (QCDA 2009). The expected benefits of these initiatives include reducing problem debt and welfare dependency while increasing savings and general skills, with additional effects on poverty, stress, ill-health, life-chances and social exclusion also envisaged. We use data from the first 16 annual waves of the British Household Panel Survey to examine whether financial capability affects an individual's psychological health independently of the impacts associated with income and financial resources more generally.

Financial capability is conceptually different from income or material wellbeing and reflects people's ability to manage their money and take control of their finances (Atkinson et al. 2006). It is concerned with making appropriate financial decisions, understanding how to manage credit and debt and identifying appropriate products and services (Mason and Wilson 2000; Noctor et al. 1992). The complexity of skills required to be financially capable will vary across households and depend on a range of factors such as household size and composition, housing tenure, income and expenditure patterns and so on. Regardless of how much money they have, people require financial management skills, and these become even more important during an economic downturn when additional pressures are placed on households' finances. Over the last two decades credit has become more widely available, responsibility for provision in retirement has increasingly fallen onto individuals and the costs of higher education are increasingly borne by students. The aftermath of the recent recession has seen real incomes falling for many households while the cost of living continues to increase. Therefore the consequences of a lack of financial capability are becoming progressively more serious. However studies suggest that many people are not well informed about financial products, undertake little long-term planning or budgeting and most financial decisions are reactive rather than proactive (Financial Services Consumer Panel 2003a,b).

Recent studies have attempted to measure financial capability and its impacts using survey data. For example Atkinson et al. (2006; 2007), using a survey commissioned to explicitly measure financial capability in Britain (FSA 2006b), identify five contributory domains: making ends meet, managing money, planning ahead, choosing products and staying informed. They create scores within each domain and conclude that older people, people with higher incomes and those in couples with no dependent children have greatest financial capability while younger people, people in couples with dependent children, single people and those with lower income have least. Taylor (2011) uses British survey data to construct a measure of financial capability and similarly reports strong correlations with age, household structure and employment status. Melhuish et al. (2008) use a sample of mothers on low income and find that greater financial capability is associated with higher psychological wellbeing.

There is a large literature describing associations between various indicators of financial distress and psychological ill-health (e.g. Bridges and Disney 2010; Marmot et al. 1997; Taylor et al. 2007; Weich and Lewis 1998). Although the causality of such links is sometimes questioned, studies using longitudinal data suggest that debt and financial stress cause psychological problems (Marmot et al. 1997; Stradling 2001; Taylor et al. 2007; Webley and Nyhus 2001). Similarly consumer debt, mortgage indebtedness, arrears, repossession and eviction have been shown to cause anxiety and psychological ill-health (Brown et al. 2005; Ford et al. 1995; Nettleton and Burrows 1998; Pevalin 2009; Taylor et al. 2007). However, many such studies focus only on psychological distress – they concentrate on the extreme of the distribution rather than the whole continuum.

Our contribution to this literature is to assess the impact of financial capability on psychological health when allowing for other confounding factors and measures of economic resources such as household income, employment status, family structure and housing tenure. Following Taylor (2011) we construct a financial capability measure from variables in a general household survey that relate directly to people's abilities to make ends meet and their money management. This rests on the hypothesis that there is some underlying factor (financial capability) which is better captured by reviewing a range of indicators of a person's current financial situation than by any of the specific items of information individually. This is similar to how researchers construct deprivation measures using lifestyle indicators (Burchardt et al. 2002; Cappellari and Jenkins 2007; Gordon et al. 2000; Layte et al. 2001;

Mack and Lansley 1985; Whelan et al. 2001; 2003). We extend existing research by (i) distinguishing between financial capability, income and economic resources within a nationally representative sample of adults in Britain; and (ii) assessing the impact of financial capability on psychological health over and above the impacts of income and economic wellbeing more generally. We adopt statistical techniques that account for unobserved factors likely to be associated both with financial capability and psychological health, and which may otherwise bias estimates from multivariate models. We then illustrate the relative impacts on psychological wellbeing of having different financial capabilities and incomes.

2. Theoretical framework

We anticipate that a person's financial capability affects their psychological health through two processes. Firstly, financial capability is likely to be correlated with other observable characteristics that affect psychological health, such as income and material wellbeing. The financially capable will manage their incomes more efficiently and, all else equal, have higher levels of disposable income (or lower levels of debt) than the less financially capable with otherwise similar characteristics. Access to greater economic resources infers higher living standards and wellbeing as people with higher incomes are more able to meet their material aspirations and will feel better off (Easterlin 2001). However there is no empirical consensus about whether income itself enhances wellbeing, as theory would predict. Most studies report a small positive impact (Clark et al. 2001; Frey and Stutzer 2000; Frijters et al. 2004), while others argue that it is relative rather than absolute income that matters (Blanchflower and Oswald 2004). In this case, what affects people's psychological health is the difference between their own economic resources and those of others in their reference group (Wagstaff and van Doorslaer 2000). If the impacts of financial capability on psychological health operate only indirectly through this relationship with economic resources, then we should find no statistically significant relationship emerging in multivariate models that control for a household's income and current financial situation.

However financial capability may have a direct impact on psychological wellbeing independent of its effect through current income and economic wellbeing. Low financial capability implies a lack of control over the current financial situation, and an inability to plan ahead or to act on acquired knowledge. In contrast high financial capability infers the ability to control economic resources efficiently and hence to control future incomes and material and economic wellbeing, and to exploit knowledge of financial information. A great

deal of research testifies to the importance of feelings of control in maintaining well-being. For instance, individuals who have control over their work tend to have fewer health problems than workers who lack such control (e.g. Kivimäki et al. 2002). This is analogous to the literature on locus of control which differentiates between an internal locus of control, in which people feel control over outcomes, and an external locus of control, in which people feel their outcomes rest with others or are the result of luck. It has been consistently demonstrated that individuals with a more internal locus of control tend to enjoy higher levels psychological well-being than individuals with a more external locus of control (DeNeve and Cooper 1999; Peacock and Wong 1996; Peterson 1999). In addition, capability theory suggests that high financial capability, as well as providing a stock of knowledge and skills, also allows people wider access to institutions and their external environment. This aids the development of other abilities that allow them to adopt their desired life-style and take advantage of the opportunities that they have (Johnson and Sherraden 2007; Nussbaum 2002; Robeyns 2005; Sen 1993).

These theories suggest that people with high financial capability have more control over their financial situation and their external environment and are more able to manage their economic resources and adopt desired lifestyles. Therefore we hypothesise that the lack of financial control implied by low financial capability will therefore result in stress and psychological ill-health, particularly when dealing with negative income shocks, and that this will persist in multivariate analyses that also control for household income and current financial situation. Our approach is to assess the independent impact of financial capability on psychological health over and above its effect through income and material wellbeing, when holding a range of other observable characteristics (such as employment status, family structure and housing tenure) constant.

We make no assumptions about how improvements in financial capability may be achieved, and instead focus on the psychological implications. Traditional policy approaches would take the form of increasing the flow to consumers of information about appropriate financial products and financial planning strategies. However recent evidence from behavioural economics suggests that consumer's behaviour can be changed by changing the environment within which they act (e.g. de Meza et al. 2008; Elliot et al. 2010). We return to this issue in our concluding section.

3. Data

We use data from waves 1–16 of the British Household Panel Survey (BHPS), covering the survey years 1991 to 2006. The BHPS is a panel survey which (re)interviews the same individuals annually. The first wave was designed as a nationally representative random sample of the population of Great Britain living in private households in 1991. These original respondents and any adult co-residents have been followed and interviewed at annual intervals ever since, with information collected about their incomes, labour market status, housing tenure and conditions, household composition, education, health and many other aspects of their lives. The BHPS is unique among British datasets in having annual snapshots of people's lives over a relatively long period.

We use a subsample drawn from the BHPS data, excluding those who were in full-time education or who had missing data on any relevant variables. This results in sample sizes of 7,680 men (contributing 52,127 person-year observations) and 8,318 women (contributing 61,614 person-year observations). We use an unbalanced panel and allow people to enter and leave the sample over time.

The BHPS has a number of strengths for these analyses. It is a nationally representative sample, it is a panel dataset allowing us to track changes in people's circumstances over time, and includes a number of variables useful in identifying both financial capability and psychological health. The weakness of the BHPS is that there are no direct measures of people's knowledge of financial products or their financial management skills which may be collected in more specialist surveys. However such specialist surveys tend to lack important contextual information and be cross-sectional. Therefore we exploit the advantages of the BHPS and use the information it provides to generate a measure of financial capability which we argue is genuinely informative about people's financial management skills.

3.1 Constructing a measure of financial capability

Although the BHPS lacks direct information on individual's financial management skills, it collects a range of data about their current financial situation (which reflects their financial capability). Table 1 describes the variables in the BHPS that capture different dimensions of financial capability and relate in particular to making ends meet and money management. Some reflect people's perceptions of their financial situation (for example items [1], [2] and [4]), which have been shown to be associated with psychological health (Bridges and Disney

2010; Wildman 2003). Others capture over-indebtedness (e.g. items [5] and [7]) and the ability to plan for the future and to manage money (e.g. items [3] and [6]), cited as key to financial capability (FSA 2005).¹ These variables do not directly measure people’s financial knowledge or management skills, and responses to some reflect a household’s current financial situation or resources more generally (or the macro-economic climate). They also do not reflect the nature or complexity of the individual’s or household’s financial situation or of the cognitive demands involved in financial decision making – although we take this into account through multivariate analysis. However we argue that once adjusting for income and business cycle effects, they are genuinely informative about a person’s financial capability and money management skills.²

Table 1: Financial capability: Relevant BHPS variables available at each wave

How well would you say you yourself are managing financially these days? Would you say you are living comfortably, doing alright, just about getting by, finding it quite difficult, or finding it very difficult
Would you say that you yourself are better off, worse off or about the same financially than you were a year ago?
Do you save any amount of your income for example by putting something away now and then in a bank, building society, or Post Office account other than to meet regular bills?
Many people these days are finding it difficult to keep up with their housing payments. In the last twelve months would you say you have had any difficulties paying for your accommodation?
Did you have to borrow in order to meet housing payments?
Did you have to make cutbacks in order to meet housing payments?
In the last twelve months have you ever found yourself more than two months behind with your rent/mortgage?

We follow Taylor (2011) and adopt a two stage procedure in constructing a financial capability indicator from these data. The first is to assess whether these variables can be interpreted as reflecting a common underlying characteristic and if so to generate this. As the resulting factor is likely to reflect an individual’s current financial situation, their resources or the general economic climate as much as their financial capability, the second stage adjusts it for people’s household incomes and the macroeconomic climate. We argue that the variables available in the BHPS are genuinely informative about people’s financial capability once we control for income and business cycle effects.

¹ Most of these measures are objective (i.e. reporting a household’s actual financial situation) rather than subjective (i.e. reporting a household’s *perception* of their current financial situation), and as such will be less influenced by comparisons with peer groups.

² Taylor (2011) provides summary statistics describing responses to these questions across the sample period.

In Table 2 we present a matrix of Spearman rank correlation coefficients which illustrate the degree of association between the variables.³ We pool all 16 waves of BHPS data, as our interest is in constructing a measure that can be applied consistently across the sample period rather than examining changes in associations between variables over time. Also, because we include a number of variables that relate to housing payments, at this stage we exclude individuals in households receiving Housing Benefit.⁴ The strongest correlations (of above 0.3) are found between an individual's perceived current financial situation and reporting that their situation has worsened over the previous 12 months, and between the housing payment problem variables (which is to be expected given the structure of these questions).

Table 2: Correlations between financial variables: BHPS 1991–2006

	Financial situation	Worsened	Saves (-)	Housing payment problems	Required borrowing	Required cutbacks	Arrears
Financial situation	<i>1.00</i>	0.34	0.27	0.24	0.12	0.23	0.12
Situation worsened		<i>1.00</i>	0.14	0.13	0.07	0.12	0.06
Saves (-)			<i>1.00</i>	0.11	0.06	0.10	0.06
Housing payment problems				<i>1.00</i>	0.47	0.89	0.42
Required borrowing					<i>1.00</i>	0.42	0.26
Required cutbacks						<i>1.00</i>	0.40
Arrears							<i>1.00</i>
Mean	0.22	0.14	0.12	0.38	0.23	0.36	0.22
Factor weights	0.079	0.041	0.053	0.522	0.061	0.350	0.057

Notes: Figures reported are Spearman rank correlation coefficients. See text for how variables are constructed and defined. Final row gives weights each variable contributes in generating principal factor.

We can construct a consistent summary measure from these variables if there is a tendency for an individual who scores highly on one to also score highly on each of the others. We use Cronbach's alpha to test this, which takes a value between 0 and 1. A value of one indicates perfect internal consistency, and the literature suggests that a good summary indicator should have a value of alpha of at least 0.7 (Nunnally and Bernstein 1994). The internal consistency of the principal underlying factor reflected in these variables yields a Cronbach's alpha of 0.71, and removing any of the variables from the analysis weakens this internal consistency. Year-specific estimates show Cronbach's alphas that vary between 0.67 and 0.73, suggesting internal consistency across time.

³ We have standardized correlations with the savings variable such that positive correlations indicate that individuals in difficult financial circumstances are less likely to save.

⁴ Housing Benefit is a means tested social security benefit in the UK that helps people meet their housing costs.

We use factor analysis (regression scoring) to construct the principal underlying factor reflected in these variables, which represents a weighted combination of individuals' perceptions of and more objective indicators of their current financial situation. The final row in Table 2 gives the factor weights, and shows that most weight is given to housing payment problems and problems required cutbacks. Table 3 presents descriptive statistics for the resulting factor, which for simplification we have multiplied by -1 so that higher values reflect greater financial ability and vice versa. The principal factor has a mean of -0.038 and a standard deviation of one, and ranges from -4.947 to 0.397 .⁵

Table 3: Descriptive statistics for principal factor

	Mean	Std Dev	Min	Max
Principal factor	-0.038	1.007	-4.947	0.397

Notes: Principal factor obtained using regression scoring from: Current financial situation; Financial situation worsened since last year; Whether saves; Has housing payment problems; Problems required borrowing; Problems required cutbacks; and Been at least 2 months in arrears in last 12 months.

This factor captures a person's current resources or the general economic climate as much as their financial capability. To obtain an indicator of financial capability, we adjust it for income and business cycle effects. Doing so will yield a measure of people's ability to manage their money effectively independent of their income and the general economic climate and will more accurately reflect their financial capability. We adjust for income and business cycle effects using Ordinary Least Squares (OLS) regression, with the principal factor as the dependent variable. The control variables include each individuals' real household income (deflated to January 2006 prices), whether or not the person lives in a household that receives Housing Benefit, real GDP in the quarter and year of interview (deflated to January 2006 prices), and the change in GDP since the previous year. The estimated coefficients, presented in Table 4, indicate that people's financial situation improves with their income (but at a declining rate), and with GDP and the change in GDP. People in receipt of Housing Benefit are in a worse financial situation than those who do not receive Housing Benefit. We use the residuals from this regression as our measure of

⁵ By construction the common factor is normalised to have mean zero. However we exclude those in receipt of Housing Benefit in constructing the factor weights, but not in constructing the principal factor. The fact that Housing Benefit recipients have below average values for the principal factor indicates that they have below average financial capability.

financial capability: they capture the portion of people’s financial situation that cannot be explained by their income or the general economic climate.⁶

Table 4: Adjusting principal factor for income and business cycle effects

Variable	Coefficient
Monthly household income (£1,000)	0.0721
Household income squared (£10,000)	-0.0309
Household income cubed (£100,000)	0.0027
Receives Housing Benefit	-0.3720
Real GDP (£bn)	0.2061
Annual change in GDP (£bn)	0.0136
Constant	-0.8206
Number of observations	113,741
Number of individuals	15,998
R ²	0.0367

Notes: Estimates from OLS regression where the dependent variable is the principal underlying factor derived using regression scoring method from: Current financial situation; Financial situation worsened since last year; Whether saves; Has housing payment problems; Problems required borrowing; Problems required cutbacks; and Been at least 2 months in arrears in last 12 months. All coefficients are statistically significant at 0.1% level. Household income and GDP deflated to January 2006 prices.

We next examine how people’s financial capability changes between one year and the next. We do this by constructing pairs of successive years of observations through the panel (‘ $t-1$ ’ and ‘ t ’) and then pooling all the pairs. Table 5 summarises changes in people’s financial capability by a range of positive and negative events. The final row indicates that on average changes were positive, with average financial capability improving from 0.033 in year $t-1$ to 0.036 in year t . This year-on-year change is independent of income and the business cycle, and so reflects small (and statistically insignificant) average improvements in people’s money management skills over time. This table also indicates that people who enter or exit unemployment, or whose marriage dissolves, have significantly lower financial capability than average both before and after the event. Changes in income are associated with changes in financial capability that are significantly different from the average change – falls in household income reduce financial capability while increases in household income improve financial capability.

⁶ Taylor (2011) describes the properties of this measure in detail, and finds it to be relatively stable over time, positively correlated with age, education, being employed and working in the financial sector and negatively correlated with unemployment.

Table 5: Financial capability by life events

	Mean financial capability			N
	<i>t-1</i>	<i>t</i>	Change	
<i>Negative events between two consecutive years</i>				
Real household income fell <i>t-1</i> to <i>t</i>	0.033	0.032 ^ψ	-0.001 [†]	37201
Entered unemployment <i>t-1</i> to <i>t</i>	-0.370 ^ψ	-0.364 ^ψ	0.005	677
Marriage dissolved <i>t-1</i> to <i>t</i>	-0.211 ^ψ	-0.387 ^{ψ*}	-0.176 [†]	481
<i>Positive events between two consecutive years</i>				
Real household income increased <i>t-1</i> to <i>t</i>	0.033	0.040 ^{ψ*}	0.007 [†]	46098
Entered work <i>t-1</i> to <i>t</i>	-0.205 ^ψ	-0.184 ^ψ	0.021	3640
Married <i>t-1</i> to <i>t</i>	-0.085 ^ψ	-0.021	0.064	1635
All	0.033	0.036	0.003	83299

Notes: BHPS 1991–2006. Weighted using cross-sectional weights. *t* refers to date of interview in current BHPS wave, *t-1* refers to date of interview in previous BHPS wave.

^ψ indicates financial capability significantly different from the average at $p < 0.05$ level.

* indicates financial capability at *t* significantly different from that at *t-1* at $p < 0.05$ level.

[†] indicates change in financial capability between *t-1* and *t* significantly different from the average at $p < 0.05$ level.

3.2 Measuring psychological health

We measure psychological health using the 12-item General Health Questionnaire (GHQ). This formed part of the BHPS questionnaire at every wave and is the most widely applied self-completion screening measure for psychiatric disorder in the UK (Goldberg and Williams 1988; McCabe et al. 1996). It has been validated in both general and clinical populations (Werneke et al. 2000; Hardy et al. 1999), although research indicates that it is best interpreted as a one-dimensional measure (Hankins 2008). The items take the form of responses to the following questions:

“Have you recently:

1. Been able to concentrate on whatever you are doing?*
2. Lost much sleep over worry?
3. Felt that you are playing a useful part in things?*
4. Felt capable of making decisions about things?*
5. Felt constantly under strain?
6. Felt you couldn't overcome your difficulties?
7. Been able to enjoy your normal day to day activities?*
8. Been able to face up to your problems?*
9. Been feeling unhappy and depressed?
10. Been losing confidence in yourself?
11. Been thinking of yourself as a worthless person?
12. Been feeling reasonably happy all things considered?*

Answers are coded on a four-point scale running from ‘Not at all/Much less than usual’ (coded 0) to ‘Much more than usual/Better than usual’ (coded 3 - asterisked questions are coded in reverse), and added together provide a total GHQ score of mental distress ranging from 0 to 36. High (low) scores correspond to low (high) psychological health and a high (low) probability of mental disorder. One advantage of using this 36-point GHQ is that it produces a roughly normal distribution of psychological health, rather than a distribution that is skewed towards psychological distress. The GHQ in the BHPS has been shown to be robust to retest effects making it a suitable longitudinal instrument (Pevalin 2000).

Table 6: Average GHQ scores by financial and life events

	Mean GHQ Scores			N
	<i>t-1</i>	<i>t</i>	Change	
In bottom 20% of financial capability distribution at <i>t</i>	12.23 [‡]	12.82 ^{‡*}	0.59 [†]	16096
In top 20% of financial capability distribution at <i>t</i>	10.90 [‡]	10.78 ^{‡*}	-0.12 [†]	17013
<i>Negative events between two consecutive years</i>				
Financial capability fell <i>t-1</i> to <i>t</i>	10.86 [‡]	11.31 ^{‡*}	0.44 [†]	46333
Real household income fell <i>t-1</i> to <i>t</i>	11.03	11.27 ^{‡*}	0.23 [†]	37201
Entered unemployment <i>t-1</i> to <i>t</i>	11.51 [‡]	13.38 ^{‡*}	1.87 [†]	677
Marriage dissolved <i>t-1</i> to <i>t</i>	13.79 [‡]	15.27 ^{‡*}	1.48 [†]	481
Widowed <i>t-1</i> to <i>t</i>	12.34 [‡]	16.95 ^{‡*}	4.61 [†]	292
<i>Positive events between two consecutive years</i>				
Financial capability increased <i>t-1</i> to <i>t</i>	11.33 [‡]	10.97 ^{‡*}	-0.36 [†]	36966
Real household income increased <i>t-1</i> to <i>t</i>	11.10	11.06 [‡]	-0.04 [†]	46098
Entered work <i>t-1</i> to <i>t</i>	11.54 [‡]	10.42 ^{‡*}	-1.12 [†]	3640
Married <i>t-1</i> to <i>t</i>	10.54 [‡]	10.49 [‡]	-0.04	1635
All	11.07	11.16	0.09	83299

Notes: BHPS 1991–2006. Weighted using cross-sectional weights. *t* refers to date of interview in current BHPS wave, *t-1* refers to date of interview in previous BHPS wave.

[‡] indicates GHQ score significantly different from the average at $p < 0.05$ level.

* indicates GHQ score at *t* significantly different from that at *t-1* at $p < 0.05$ level.

[†] indicates change in GHQ score between *t-1* and *t* significantly different from the average at $p < 0.05$ level.

Table 6 presents average GHQ scores for people at two consecutive BHPS waves (‘*t-1*’ and ‘*t*’), and the average change in GHQ scores between waves, by their financial capability and by whether they experienced a range of events. These statistics indicate that those with high financial capability at a particular point in time, defined as being in the top 20% of the financial capability distribution, on average had statistically significantly lower GHQ scores (10.78) than those with low financial capability (12.82), defined as being in the bottom 20% of the financial capability distribution. Furthermore, those with high financial capability experienced a fall in their GHQ scores while those with low financial capability experienced

a rise in GHQ scores. There are also substantial psychological costs associated with all the negative events, and significant psychological benefits associated with improvements in financial capability, increases in household income and entering work. For example, average GHQ scores increased significantly for people whose financial capability fell between two consecutive years, from 10.86 at $t-1$ to 11.31 at t . This increase is larger than that associated with a fall in household income, although smaller than that associated with entering unemployment, marriage dissolution and becoming widowed. An increase in financial capability was associated with a significant fall in GHQ, from 11.33 to 10.97, which was larger than that associated with an increase in income or getting married (but smaller than that associated with entering employment).

Therefore these descriptive statistics suggest that financial capability is positively correlated with psychological health, and that improvements in financial capability are associated with improvements in psychological health while falls in financial capability are associated with falls in psychological health. Changes in psychological health associated with changes in financial capability are larger than those associated with changes in household income. In the remainder of the paper we investigate how robust these findings are to controlling for a range of observed and unobserved factors, including income and material wellbeing.

4. Estimation strategy

In estimating the impact of financial capability on psychological health, it is important to consider both observed factors (such as income and material wellbeing) and unobserved factors (such as personality traits and psychological characteristics related to, for example, a person's locus of control) that are likely to be associated both with financial capability and psychological health (Bridges and Disney 2010; De Neve and Cooper 1999). We control for observable factors by estimating multivariate models of psychological health. We remove unobserved effects by estimating these models in terms of deviations from individual-specific means using 'within-group fixed effects' (see Wooldridge 2002). The advantage of this approach over 'random effects' models is that it allows for potential correlations between the unobserved factors and the observed predictors, although the disadvantage is that it does not allow estimates of the coefficients on observed predictors that are constant over time (e.g. gender, ethnicity).

Multivariate analysis allows us to control for potentially confounding and mediating characteristics of individuals and the households in which they live. This is important in the current context as financial capability is related to economic wellbeing, and the financial management skills required to make appropriate decisions will depend on household size and structure, employment status, income and expenditure patterns and so on. Such factors are also likely to be correlated with psychological health. The BHPS is a particularly rich source of such characteristics allowing more reliable coefficients to be estimated. We write the model as:

$$GHQ_{it} = FC_{it}\beta_0 + x_{it}\beta_1 + \varepsilon_{it} \quad [1]$$

Where FC_{it} is individual i 's financial capability at year t , x_{it} is a vector of other observed characteristics and ε_{it} is the error term. Estimating [1] by OLS ignores any unobserved characteristics (such as personality traits) that are included in ε_{it} . If these are correlated with observed characteristics then OLS estimation will yield biased estimates for the coefficients of interest. Panel data models allow us to control for the effects of such unobserved characteristics that are fixed over time, and that may also be correlated with GHQ, financial capability and other explanatory variables. Such unobservable characteristics can be separated from the random error as in [2], where η is the time invariant individual-specific effect capturing unobserved characteristics:

$$\varepsilon_{it} = \eta_i + h_{it} \quad [2]$$

Furthermore, within-individual fixed effects models allow unobservable characteristics to be arbitrarily correlated with the observable characteristics. The models are estimated by taking deviations from individual-specific means over time in both the dependent and explanatory variables. Therefore the effect on GHQ of all unobserved characteristics that are fixed over time are removed by de-meaning:

$$GHQ_{it} - \overline{GHQ}_i = \beta_0 (FC_{it} - \overline{FC}_i) + \beta_1 (x_{it} - \overline{x}_i) + h_{it} \quad [3]$$

A positive value for β_0 would imply that higher financial capability is associated with higher GHQ scores, while a negative coefficient indicates that higher financial capability is associated with lower GHQ.

We control for factors that are important determinants of psychological health as well as financial shocks and events that are likely to be correlated with financial capability. We include household income as well as household wealth (Lea et al. 1993) by including self-

assessed house value for home owners together with monthly housing payments (Brown et al. 2005; Ford et al. 1995; Nettleton and Burrows 1998). The former takes the value zero for people in rented accommodation. We also include a variable indicating whether or not the household was in receipt of Housing Benefit. To capture material wellbeing more generally, we include the number of items from the following that the household is able to afford: adequately heat their home; an annual holiday; replace worn out furniture; buy new clothes; eat meat on alternate days; feed visitors once a month. This was not incorporated into our measure of financial capability because it was only asked from Wave 6 of the BHPS and could not be included consistently over time.⁷

There is a large literature documenting the impact of unemployment on mental health (Clark and Oswald 1994; Hauck and Rice 2004; Wildman 2003). We therefore include indicators of current labour market status together with a variable indicating whether or not the individual lost their job within the last year to distinguish between the immediate and longer-term psychological costs associated with being jobless. For those in employment, we include indicators of whether they were working full- or part-time, whether or not they were self-employed and whether or not they were in permanent jobs.

Other control variables include factors that reflect the complexity involved in making financial decisions such as household expenditure patterns and resource requirements such as marital status (Pevalin and Goldberg 2003; Wade and Pevalin 2004; Wildman 2003) and the number of children in the household (Lea et al. 1993). We also include region of residence and year of interview as explanatory variables. To control for the respondent's state of mind at the time of interview, we include variables identifying whether they expected their financial situation to improve or deteriorate in the coming year.

5. Results

Tables 7 and 8 present estimated coefficients for men and women respectively. We distinguish between men and women because of differences in household structures, labour supply, preferences and the determinants of psychological health (Arber 1991; Hauck and Rice 2004; Juong et al. 1997; Piccineli and Wilkinson 2000; Taylor et al. 2007; Wildman

⁷ This variable takes the value zero for waves 1 to 5.

2003).⁸ We estimate two models. Model 1 includes the financial capability indicators together with a range of covariates to control for income, household and demographic characteristics. Model 2 introduces interaction terms to examine the extent to which having high or low financial capability affects the impact on psychological health of income, labour market status or divorce.⁹ In the following we discuss the estimates for each sex separately.

5.1 Men

We discuss the results for men first: see Table 7. Model 1 indicates that having high (low) financial capability is associated with GHQ scores that are 0.58 points lower (1.28 points higher) than men whose financial capability is in the middle of the distribution.¹⁰ Therefore having low financial capability is associated with lower levels of psychological health (a higher probability of mental disorder) while high financial capability is associated with higher levels of psychological health. These impacts are independent of income and material wellbeing more generally.¹¹

The coefficients on the financial situation indicators show that being able to afford more items improves psychological health, as does household income.¹² Consistent with the literature, being divorced and being unemployed are associated with significantly lower psychological health (by 1.16 and 1.37 GHQ points). Retired men on average have lower GHQ scores than employed men, all else equal, by 0.56 points. More optimistic men who expect their financial situation to improve have GHQ scores that are 0.23 points lower than those who expect it to remain the same while men who expect it to deteriorate have GHQ

⁸ Recall that our within-individual fixed effects estimation procedure does not allow us to identify the impact of gender directly.

⁹ We have also investigated the relationship between financial capability and life satisfaction and the probability of suffering health problems associated with anxiety or depression (see Taylor et al 2009). The results are consistent with those presented here.

¹⁰ Again, high financial capability equates to being in the top 20% of the financial capability distribution, while low financial capability equates to being in the bottom 20%.

¹¹ We have investigated issues of causality in more detail by replacing current financial capability with financial capability one year ago. This helps to overcome potential endogeneity caused by people's low psychological health affecting their financial capability. Results indicate that low (high) financial capability at $t-1$ is associated with significantly higher (lower) GHQ scores at t , although the sizes of the effects are smaller. However there are complex timing issues involved in estimating models using lagged financial capability, related to the relationships between financial capability and other covariates (for example unemployment or divorce may be correlated both with financial capability and psychological health, and measuring these events in different time periods would not necessarily capture this association). This may introduce biases and specification errors into the lagged models. We therefore prefer the estimates presented in Tables 7 and 8 and leave investigation of these issues for further research.

¹² The estimated coefficient on the log of household income indicates that a one log-point increase in gross monthly household income (which equates to about £1440 at the sample means) reduces GHQ scores by about 0.2 points, which as we illustrate later is a relatively small effect.

scores that are 0.49 points higher. Men who receive Housing Benefit also suffer lower levels of psychological health.

Table 7: Regression models of the determinants of GHQ scores, men: BHPS 1991–2006

	[1]	[2]
Has high financial capability	−0.583*** [9.47]	−0.825 [1.43]
Has low financial capability	1.277*** [24.77]	4.176*** [7.26]
Has high financial capability and:		
Log household income		0.038 [0.49]
Divorced or separated		−0.171 [0.77]
Unemployed		−0.333 [1.25]
Retired		0.158 [1.21]
Has low financial capability and:		
Log household income		−0.367*** [5.15]
Divorced or separated		0.691*** [2.98]
Unemployed		0.556** [2.56]
Retired		−0.885*** [4.49]
Number of items afforded	−0.172*** [7.07]	−0.166*** [6.81]
Log household income	−0.194*** [4.92]	−0.119** [2.33]
Unemployed	1.366*** [11.94]	1.157*** [7.22]
Retired	−0.559*** [4.71]	−0.500*** [3.89]
Married	0.322** [2.26]	0.303** [2.13]
Divorced	1.163*** [6.54]	1.000*** [5.09]
Widowed	1.382*** [5.61]	1.326*** [5.38]
Expect financial situation to improve	−0.233*** [4.92]	−0.235*** [4.97]
Expect financial situation to worsen	0.490*** [7.74]	0.494*** [7.80]
Receives Housing Benefit	0.651*** [5.65]	0.694*** [5.89]
Within R ²	0.038	0.040
Number of individuals		7,680
Number of observations		52,127

Within-group estimation results. Absolute ratio of coefficient to standard error in brackets. Dependent variable is 36-point GHQ score. Models also include age, number of children, housing tenure, job type (if employed), house value if home-owner, housing costs, region and year dummies. ***, **, * indicate statistical significance at the 1%, 5% and 10% level respectively.

Model 2 introduces interactions between having low and high financial capability and income, being divorced, unemployed and retired. Results indicate that the relationship between high financial capability and psychological health is independent of income, labour market status and marital status – the estimated coefficients on the interaction terms are not statistically significant. Therefore men with high financial capability enjoy the psychological benefits irrespective of their household income.

In contrast, the impact on psychological health of low financial capability does vary with income. In particular, the psychological costs of low financial capability fall as incomes increase. This indicates that higher incomes can compensate for low financial capability, and we explore the relative sizes of these effects later. The estimated coefficients interaction terms also indicate that the psychological costs associated with being divorced and unemployed are higher among men with low financial capability. Assuming a household income of £2000 per month, divorced men with low financial capability have GHQ scores that are 3.66 ($4.176 + 0.691 - (0.367 * \log(2000))$) points higher than otherwise similar divorced men who have average financial capability. Unemployed men with low financial capability have GHQ scores that are 3.52 ($4.176 + 0.556 - (0.367 * \log(2000))$) points higher than otherwise similar unemployed men who have average financial capability. In contrast, being retired reduces the psychologically harmful impacts of having low financial capability – the interaction term is negative and statistically significant. Therefore for men low financial capability has significant and substantial psychological costs independent of those associated with low income or deprivation more generally. Low financial capability also exacerbates the psychological costs associated with being divorced and unemployed, while being retired reduces the psychologically damaging effects low financial capability. In contrast, high capability improves psychological health.

To illustrate the relative magnitudes of the estimated financial capability and income effects, in Figure 1 we plot predicted GHQ scores by financial capability and household income for men.¹³ This indicates that men with low financial capability and low income (£500 per month) have the highest predicted GHQ scores at 12.2. Increasing household income reduces GHQ scores, and does so considerably for men with low financial capability such that men with low financial capability and household incomes of £4,500 per month have a predicted

¹³ These predicted probabilities are estimated at the sample means of the other covariates.

GHQ score of 11.1. However, this is still higher than the 10.4 predicted for men with average financial capability and an income of £500 per month. Hence large increases in incomes are necessary to offset the psychologically harmful effects of having low financial capability. In other words, the psychological benefits associated with having more financial capability are considerably larger than those associated with having more income – the ability to manage finances is more important than the level of income itself in determining a man’s psychological wellbeing.

Figure 1: Predicted GHQ scores by income and financial capability: Men

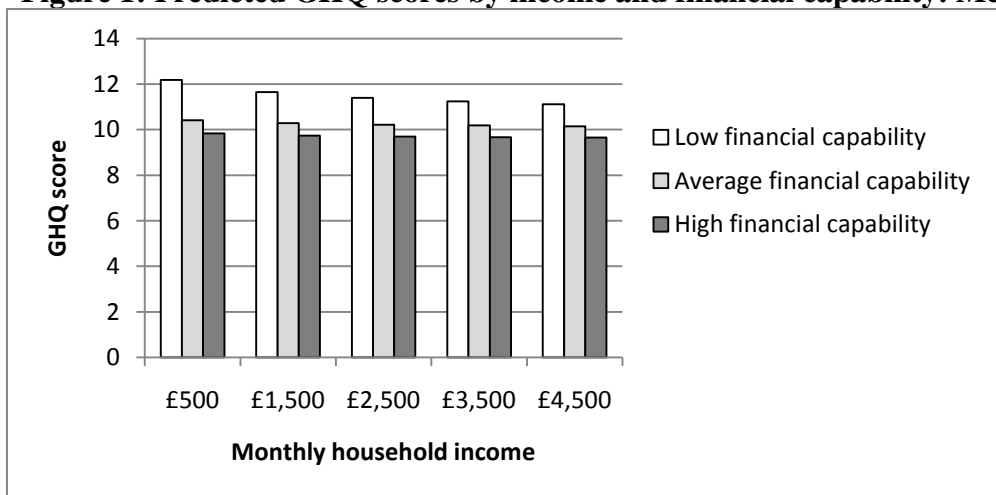
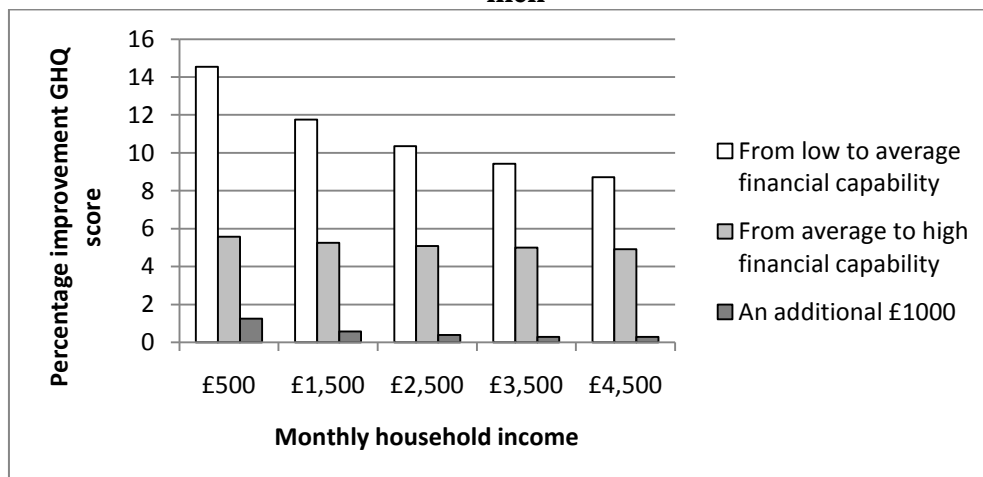


Figure 2: Percentage improvement in GHQ scores by income and financial capability: men



This is also illustrated in Figure 2, in which we plot the predicted percentage improvements in GHQ scores at different income levels associated with shifting an otherwise ‘average’ man from low to average financial capability, from average to high financial capability, and from giving the man an additional £1,000 per month income. This indicates that, at low incomes (£500 per month), moving the man from low (average) financial capability to average (high)

financial capability is associated with a 14.5% (5.6%) improvement in his GHQ score. In contrast, an additional £1,000 per month of income is associated with an improvement in GHQ score of just 1.3%. Hence changes to financial capability are associated with relatively large changes in psychological health relative to changes in income.¹⁴ This pattern persists at different household incomes, although the relative improvements in GHQ scores associated with moving a man from low to average financial capability fall at higher levels of income.

5.2 Women

Table 8 presents estimates for women. Model 1 indicates that low financial capability increases GHQ scores by 1.3 points (comparable in size to being divorced or unemployed), while high financial capability reduces GHQ scores by 0.53 points. Therefore as for men, there are psychological benefits (costs) associated with high (low) financial capability. Coefficients on other variables are consistent with those for men, although it is noticeable that unemployment has a larger impact on psychological health among men than women, while being a widow has a larger impact on women than men.

Model 2 introduces interactions between current financial capability, income, labour market status and being divorced. As for men, we find that the impacts of income, being divorced, unemployed and retired on psychological health are sensitive to a woman's financial capability. Assuming a monthly household income of £2000, a divorced woman with low financial capability has GHQ scores that are on average 2.92 ($2.844 + 0.758 - (0.207 * \log(2000))$) points higher than an otherwise similar woman who has average financial capability. Low financial capability compounds the psychologically harmful effects of being divorced. It also compounds the impact of being unemployed, increasing GHQ scores by 2.61 ($2.844 + 0.449 - (0.207 * \log(2000))$) GHQ points relative to an otherwise similar unemployed woman with average financial capability. As with men, the psychologically harmful effects of low financial capability are offset by having higher incomes and by being retired – the estimated coefficients on these interaction terms are negative and statistically significant. Therefore for women we find that having low financial capability has significant and substantial psychological costs over and above those associated with income or deprivation

¹⁴ We find similar effects when using life satisfaction as a measure of wellbeing. In particular, we find that moving from low to average financial capability is associated with a 5.4% increase in life satisfaction at £500 per month, falling to 4% at £4,500 per month. In contrast, an increase of £1,000 per month in household income is associated with at most a 1.2% increase in life satisfaction.

more generally and that the size of this effect is similar to that of being divorced. High financial capability is associated with better psychological health.

Table 8: Regression models of the determinants of GHQ scores, women: BHPS 1991–2006

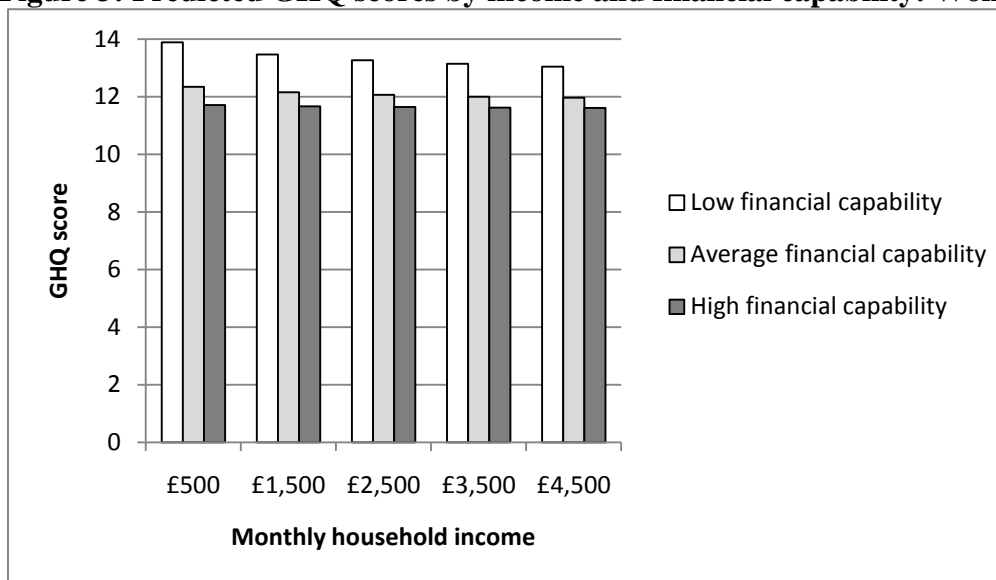
	[1]	[2]
Has high financial capability	−0.527*** [8.50]	−1.504** [2.51]
Has low financial capability	1.286*** [22.92]	2.844*** [4.84]
Has high financial capability and:		
Log household income		0.130 [1.63]
Divorced or separated		−0.081 [0.44]
Unemployed		−0.388 [1.17]
Retired		0.320** [2.49]
Has low financial capability and:		
Log household income		−0.207*** [2.83]
Divorced or separated		0.758*** [3.85]
Unemployed		0.449* [1.74]
Retired		−0.392** [1.97]
Number of items afforded	−0.182*** [7.34]	−0.177*** [7.14]
Log household income	−0.194*** [4.59]	−0.174*** [3.27]
Unemployed	0.973*** [7.34]	0.868*** [4.77]
Retired	−0.391*** [3.37]	−0.441*** [3.45]
Married	0.624*** [3.94]	0.596*** [3.76]
Divorced	0.997*** [5.76]	0.798*** [4.14]
Widowed	1.976*** [9.26]	1.938*** [9.07]
Expect financial situation to improve	−0.186*** [3.60]	−0.182*** [3.52]
Expect financial situation to worsen	0.520*** [7.88]	0.529*** [8.01]
Receives Housing Benefit	0.352*** [3.39]	0.375*** [3.55]
Within R ²	0.027	0.028
Number of individuals		8,318
Number of observations		61,614

Within-group estimation results. Absolute ratio of coefficient to standard error in brackets. Dependent variable is 36-point GHQ score. Models also include age, number of children, housing tenure, job type (if employed), house value if home-owner, housing costs, region and year dummies. ***, **, * indicate statistical significance at the 1%, 5% and 10% level respectively.

Furthermore low financial capability compounds the impacts of being divorced or unemployed on psychological health among women, while the effects of low financial capability are offset with higher income or being retired.

To illustrate the relative magnitudes of the estimated financial capability and income effects, in Figure 3 we plot predicted GHQ scores by financial capability and household income for women. This indicates that women with low financial capability and low income (£500 per month) have the highest predicted GHQ scores at 13.9. As for men, increasing household income reduces GHQ scores especially for women with low financial capability. Women with low financial capability and household incomes of £4,500 per month have a predicted GHQ score of 13. However it is clear that having low income but average financial capability is associated with lower GHQ scores – indicating that as for men financial capability has a larger impact on psychological health than household income, all else equal. Large increases in incomes are necessary to offset the psychologically harmful effects of having low financial capability.

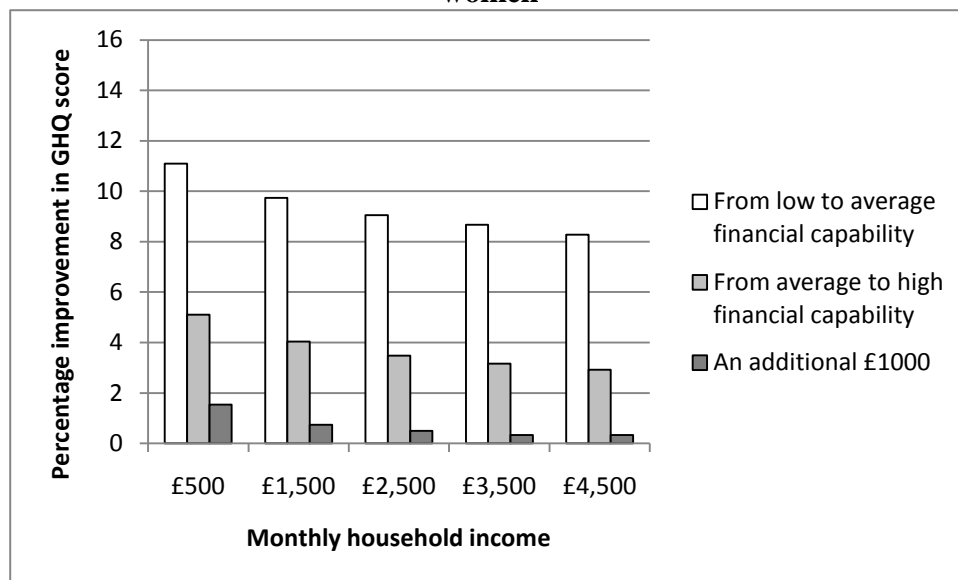
Figure 3: Predicted GHQ scores by income and financial capability: Women



In Figure 4 we plot the predicted percentage improvements in GHQ scores at different income levels associated with shifting an otherwise ‘average’ woman from low to average financial capability, from average to high financial capability, and from giving the woman an additional £1,000 per month income. At low incomes (£500 per month), moving the woman from low (average) financial capability to average (high) financial capability is associated

with a 11% (5%) improvement in her GHQ score. In contrast, an additional £1,000 per month of income is associated with an improvement in GHQ score of just 1.5%. Hence changes to financial capability are associated with relatively large changes in psychological health relative to changes in income.¹⁵ This pattern persists at different household incomes, and although the relative gains in GHQ scores associated with improvements in financial capability fall at higher levels of income they remain much larger than those associated with an additional £1,000 per month of income. As for men, the ability to manage finances is more important in determining psychological health than the level of income itself.

Figure 4: Percentage improvement in GHQ scores by income and financial capability: women



6. Summary and conclusions

We have examined the impact of financial capability on an individual's psychological health, independent of the impacts associated with income, financial resources and financial shocks more generally. Having high financial capability is particularly crucial during economic recessions when a large proportion of the population experience anxiety and stress about their financial wellbeing. Financially capable people are more able to manage their income, understand how to use credit and debt effectively, have a stronger internal locus of control and develop other abilities which yield psychological benefits. Our research extends the literature on the psychological costs of problem debt, low income and deprivation, and

¹⁵ As for men, we find similar effects when using life satisfaction as a measure of wellbeing. In particular, we find that moving from low to average financial capability is associated with a 6.7% increase in life satisfaction at £500 per month, falling to 4.4% at £4,500 per month. In contrast, an increase of £1,000 per month in household income is associated with at most a 0.3% increase in life satisfaction.

suggests that a person's money management skills have additional impacts which also affect the psychological costs associated with being divorced and unemployed.

For men we find that low financial capability has significant and substantial psychological costs over and above those associated with low income or deprivation. The size of this effect is similar to that associated with being unemployed. For women the size of the effect is similar in magnitude to that of being divorced. High financial capability is associated with higher levels of psychological health for both men and women. This suggests that improving people's financial management skills would have substantial effects on stress-related illnesses and the outcomes associated with such problems, and therefore have lasting benefits for individuals and the wider economy. Furthermore, low financial capability exacerbates the psychological costs associated with being divorced or unemployed and of having low income. An implication is that by improving financial capability policy makers can reduce the psychological impacts of experiencing such life events. Therefore as well as the expected benefits of reducing problem debt, welfare dependency and poverty and increasing savings, our results indicate that improving financial capability will also have wider impacts through improving psychological health. The sizes of these improvements in psychological health dwarf those associated with raising household incomes. These results suggest that improvements in financial capability during a period when incomes are stagnant or falling in real terms will have substantial effects on psychological wellbeing.

The key policy question is how best to achieve higher financial capability and to change people's financial behaviour. Strategies could be directed at improving people's financial skills, or at changing the environment within which they make choices, or both. There is evidence that suggests that passive acquisition of specialist financial literacy skills in a school classroom has little impact on, for example, participation in saving (Cole and Shastry 2008). Instead, such interventions are more effective when people actively seek them (Hung and Yoong 2010). Recent research in behavioural economics argues that in fact changing the environment in which people make financial decisions may be more effective. Examples suggested in the literature include identifying and communicating positive financial capability norms, default financial health checks and providing financial feedback, making relevant information (e.g. on actual expenditure) salient and setting realistic targets and goals (e.g. Choi et al. 2004; DellaVigna 2009; de Meza et al. 2008; Elliot et al. 2010). While our

research does not directly contribute to this debate, it does highlight the potential benefits of improving financial capability.

There are three main limitations to our research. The first concerns the measure of psychological wellbeing used – the 12-item GHQ. Although widely applied in the literature, this measure is non-specific and is unable to discriminate between different types of mental disorder. The second limitation concerns how psychological health may also be affected by the financial capability of other household members (or indeed other family or friends). For example at the family level, a husband's low financial capability may matter less if his wife's capability is high. This is an avenue for future research. Finally, it is possible that people experience shocks or events that we do not observe that might affect both their financial capability and their psychological health. Our estimation procedure allows for time invariant characteristics of individuals, such as personality traits. However if there are particular events that people experience, but that are not captured in our data, that affect both their financial capability and their wellbeing, then these may confound the effects we find using statistical models.

Notwithstanding these limitations, our research provides suggestive new evidence of the effects of financial capability on psychological health in Britain. The impacts of having low financial capability are large and therefore financial capability can be considered to be an important determinant of mental disorder. These findings suggest that the aims of the British Government to promote and improve financial capability will, if successfully met, have beneficial spillovers on psychological health in addition to the expected benefits associated with reducing problem debt and welfare dependency and increasing savings and general skills.

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