MEASURING FINANCIAL LITERACY AND ITS CORRELATES:

A STUDY OF FIFTEEN-YEAR-OLDS IN OXFORDSHIRE AND GREATER LONDON

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ABSTRACT

Financial literacy refers to one's ability to apply knowledge and skills in order to make informed financial decisions. Both internationally and within the UK, there have been many initiatives designed to improve people's financial literacy. In particular, there has been much emphasis placed on providing financial education for young people at school. However, there has been a lack of research evidence from the UK about the levels of young people's financial knowledge, skills and attitudes. In this study, an instrument was designed to measure these key aspects. There is a personal finance test within the instrument which can produce a combined measure of financial knowledge and skills. There is also a separate section to measure levels of desired financial attitudes towards various personal finance topics. Background information was also collected from respondents in order to allow us to examine the correlates of financial literacy. The initial instrument was piloted on a group of students and validated by some subject matter experts. The final instrument was used to assess the financial literacy of a convenience sample of 3115 fifteen-year-olds from 28 schools in Oxfordshire and Greater London. The results of the personal finance test illuminated the specific topics that young people were weak in, such as understanding the workings of credit cards and compound interest. In terms of financial attitudes, the majority indicated that they were very confident about managing their own money; there was a high propensity to save money and to want to become financially independent. However, levels of desired attitudes towards spending and debt were found to be relatively low. The main correlates of financial knowledge and skills were literacy and numeracy levels, whilst financial attitudes were more strongly associated with personal characteristics. The relationships between the personal finance test scores and financial attitudes were mostly positive.

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LIST OF ABBREVIATIONS

1-PL	one parameter
2-PL	two parameters
3-PL	three parameters
ANOVA	analysis of variance
APPG	All-Party Parliamentary Group
BERA	British Educational Research Association
BSA	British Sociological Association
CTT	Classical Test Theory
CUREC	Central University Research Ethics Committee
DFE	Department for Education, United Kingdom
DIF	differential item functioning
ESRC	Economic & Social Research Council
FKS	financial knowledge and skills
FL	financial landscape
FRR	financial risk and reward
FSA	Financial Services Authority
GCSE	General Certificate of Secondary Education
ICC	Item Characteristic Curve
IEA	International Association for the Evaluation of Educational Achievement
IRT	Item Response Theory
IGFE	International Gateway for Financial Education
INFE	International Network on Financial Education
LEA	Local Education Authority
MT	money and transactions
OECD	The Organisation for Economic Co-operation and Development
PFEG	Personal Finance Education Group
PISA	Programme for International Student Assessment
PMF	planning and managing finances
PSHE	Personal, Social and Health Education
PSHEE	Personal, Social and Economic Education
RBS	The Royal Bank of Scotland Group
Rpbis	point-biserial correlation
Rbis	biserial correlation
TIMSS	Trends in International Mathematics and Science Study

Chapter One: Introduction

This chapter begins with a brief introduction to financial literacy and financial capability. The importance and lack thereof of both amongst people worldwide have resulted in calls for financial education and other policy implementations. In the UK, financial education for children and young people has achieved more recognition within the statutory education provision in recent years. Financial education is a targeted approach at helping children achieve a basic level of financial literacy before they leave school, but currently there is little evidence of how financially literate they were or have actually become. Furthermore, there is hardly any instrument available to UK schools which could be used to assess aspects of children's financial literacy. Hence in this study, the main objective was to design a suitable instrument.

1.1 Financial literacy

In recent years the Organisation for Economic Co-operation and Development (OECD), national governments, financial institutions and other organisations have become increasingly concerned about rising consumer debt, low savings rates, increases in risky mortgage borrowing, misuse of credit facilities and predatory lending, which can and do result in problems such as increases in credit delinquencies, insolvencies and personal bankruptcies (Braunstein and Welch, 2002; OECD, 2005).

These problems, combined with other developments, such as the deregulation of financial markets, the prevalence of complex financial products, increases in life expectancy and changes in pension arrangements from defined benefit to defined contribution plans, have led many to be concerned about people's ability to manage their own finances effectively

(G8 Finance Ministers Meetings, 2006; Financial Services Authority, 2003). This construct was first widely recognised as “financial literacy”.

Initially, financial literacy was described in behavioural terms. In 1992, the UK’s National Foundation for Education Research described financial literacy as “the ability to make informed judgements and to take effective decisions regarding the use and management of money” (Noctor et al, 1992: 4 as quoted in Financial services Authority (2005b: 13). This definition is somewhat vague and incomplete. It focuses on the processes and outcomes of being financially literate but does not specify what qualities make up this “ability”.

As more people took an interest in the subject, there were more discussions about the key components of financial literacy. Many felt that knowledge and skills were the key components of financial literacy; one should know about basic economic and financial concepts and be able to use them to manage personal finances (G8 Finance Ministers Meetings, 2006; Servon and Kaestner, 2008; Hung et al, 2009; Huston, 2010; Remund, 2010; Gathergood, 2011). Thus, many research studies have used financial knowledge and skills as a proxy for assessing people’s financial literacy (Lusardi and Mitchell, 2006; 2011b; Mandell, 2009a).

In recent years, the importance of having the right attitudes have been emphasised (Davies, 2002; Task Force for Financial Literacy, 2010; Atkinson and Messy, 2012; British Columbia Securities Commission, 2011; OECD, 2012), thus broadening the concept of financial literacy. It was postulated that affective factors such as attitudes can interact with the cognitive elements of financial literacy and should also be one of the key components (OECD, 2012).

1.2 Financial capability

Within the field, another term "financial capability" emerged which is often used and has caused some confusion. In the same way that financial literacy has sometimes been perceived as the equivalent of financial knowledge, financial capability has also been regarded to be synonymous with financial literacy by some. Financial capability is a concept that evolved from financial literacy and both have similar components. However, there are some distinct characteristics of financial capability which sets it apart from financial literacy.

In 2003, the UK's Financial Services Authority (FSA) used the term "financial capability" in its national strategy (Financial Services Authority, 2003). At that point however, there was no clear definition given for what "financial capability" referred to (Financial Services Authority, 2003; 2004a; 2004b; 2005a). There was also no rationale provided for why it chose not to use "financial literacy". This was likely due to a choice of priorities; the government was more interested in highlighting and solving problems rather than to spend time explaining what financial capability was. According to the 2003 national strategy, some problems led to its conception; previous research showed that there was a lack of understanding (knowledge), confidence and engagement with financial services (Financial Services Consumer Panel, 2000; 2001). This implied that financial capability was thought of to be more than just about knowledge, skills and attitudes, which were coincidentally also the key components of financial literacy.

Between 2004 and 2005, the Personal Finance Research Centre at Bristol University was commissioned by the FSA to carry out a study that would determine empirically what the components of financial capability should be in order to justify its method of measurement. This process was no doubt "empirical" but in reality, what they did was to investigate what

financial capability meant to both experts and non-experts of personal finance. An initial model of financial capability was created based on an extensive literature review which included mainly expert opinions. In this model, the components of financial capability are: knowledge and understanding; skills; confidence and attitudes (Basic Skills Agency, 2004). However, there was no suggestion of any positive relationships between these components with financial behaviour. It was argued that people have different circumstances with different financial needs. Thus, more knowledge, skills and desirable attitudes were not seen to always improve financial well-being. This model was subsequently presented to some focus groups to check whether it reflected "reality". In a similar fashion when quantitative studies test hypotheses to ascertain whether the "reality" is as hypothesised; testing the model on focus groups was deemed empirical in this particular qualitative study. Through the "lens" of these consumers, it was decided that financial capability should be measured in behavioural terms; as the focus group participants did not feel that measurements of knowledge, skills and attitudes reflect one's financial capability.

In essence, being financially literate has been widely perceived to be about having the relevant knowledge, skills and desirable attitudes. However, being financially capable refers to people's ability to make the most beneficial financial decisions based on an acute awareness of their environmental factors and personal circumstances (HM Treasury, 2007; Ofsted, 2008). As demonstrated in the UK's 2003 Financial Capability Baseline survey, the focus was on measuring five strands of financial behaviour: how well people can make ends meet; how well people can keep track of their finances; how well people can plan for the future; how well can people choose the right financial products and how much effort people made to stay informed about financial matters (Financial Services Authority, 2006c, 2006d).

A clearer distinction between financial literacy and financial capability is described in the conceptual model proposed by Sherraden (2013). According to this model (Figure 1), financial capability is a combination of being financially literate and financially included. In line with most views about financial literacy, here it is also deemed to be made up of knowledge, skills and attitudes that can be influenced directly by financial education. However the key part of the model argues that people can be financially literate but not financially capable if they do not have any access or opportunity to act. Being financially literate can determine one's financial capability and it is helpful, but not sufficient. Improving financial capability will thus require efforts that will enable more people to engage with financial institutions. For instance, many people find it hard to navigate financial jargon and if financial institutions were to make financial information more user-friendly or offer more assistance in terms of financial advice, it will enable people to make more effective financial decisions.

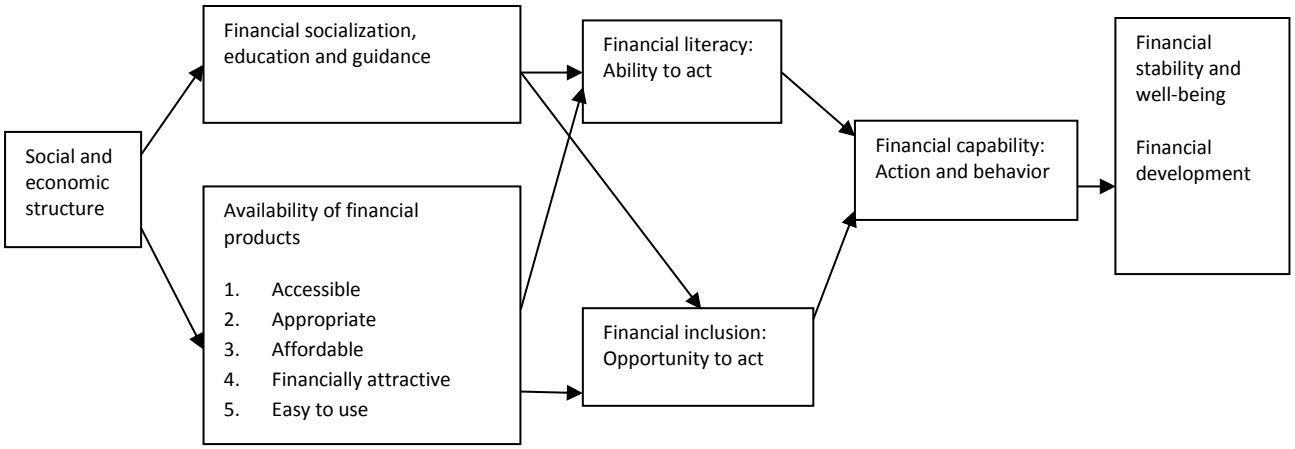


Figure 1 Financial literacy as a subset of financial capability (Sherraden, 2013:20)

In summary, financial literacy is a subset of financial capability. One can be financially literate if one has the necessary knowledge, skills and attitudes but in order to be financially capable, one has to have an acute understanding of one's financial situation and personal needs as well as access and opportunities to engage with financial services. Given that financial capability is much more than just about knowledge, skills and attitudes, it is therefore necessary to measure it in behavioural terms. Proponents of financial capability measure the "right" kind of financial behaviour while proponents of financial literacy often measure the "right" kind of financial knowledge, skills and attitudes.

1.3 Importance of financial literacy and capability

Besides highlighting the problems which have led to a concern about people's financial literacy and capability, it is also necessary to understand the relationship of both concepts with general financial well-being. Being financially literate and capable is essential for people to function in modern society. With the exception of people like Daniel Suelo, who made a choice to live without using money (Sundeen, 2013), money is a central part of most people's lives. Those who are more financially literate and capable tend to be better at budgeting, saving money and controlling expenditures (Moore, 2003; Perry and Morris, 2005); managing mortgages and debts (Lusardi and Tufano, 2009; Ajzerle et al, 2013; Wise, 2013); accumulating financial assets (Hilgert et al, 2003; Letkiewicz and Fox, 2014) and enjoy a better quality of life during retirement (Agnew et al, 2013). Adults who exhibited more desirable financial behaviour reported higher levels of financial satisfaction (Xiao, Chen and Chen, 2014; Xiao, Ahn, Serido and Shim, 2014).

People who are more financially literate and capable are more likely to be able to weather the financial ramifications of unexpected life events like death and loss of jobs. Taylor

(2011b) found positive links between the ability to make ends meet and that of mental health, living standards, savings behaviour and household income. Financial knowledge has also been found to be positively correlated with the quality of people's financial decisions for retirement planning (Lusardi and Mitchell, 2011c; Boisclair et al, 2014). On the other hand, the lack of financial knowledge has been associated with higher credit card debts amongst university students (Norvilitis et al, 2006), which often leads to a lack of focus on studies (Boylan, 2014) as well as financial distress (Davis and Mantler, 2004; Idris et al, 2013), depression and malaise (Melhuish et al, 2008).

People have to be financially literate and capable in order to select from different types of financial products offered by different financial institutions, such as savings accounts, loan products, insurance, investment products and so on. Financially literate and capable consumers are more likely to participate in the stock market (Van Rooij et al, 2007; Christelis et al, 2010; Yoong, 2010), choose financial products with lower fees (Hastings and Tejeda-Ashton, 2008) and choose appropriate financial products for retirement planning (Lusardi and Mitchell, 2007; Lusardi and Mitchell, 2008).

As people live longer, they spend more time in retirement and will need to be supported by the working population. This puts a strain on state and pension providers. The old age dependency ratio for Europe has been projected to increase from .23 in 2005 to .37 in 2030 (OECD, 2005). This is the ratio of older dependents (aged above 64) to the working age population, typically those aged between 15 and 64 (The World Bank, 2015). This implies that very likely in future, the number of workers supporting each retiree in Europe will decrease from about 5 to 3. At the same time, there is also a gradual shift of pension provision responsibility from the state to the individual (Lusardi and Mitchell, 2011a). In the

UK, there has been a gradual reduction of the basic state pension and it was estimated that it will be only about 7.5% of average earnings by 2025 (Whitehouse, 2000). All this means that being financially literate and capable has become even more important.

Traditionally and for many years in developed countries like in the UK, pension schemes were mostly of the "defined benefits type" where upon retirement, recipients knew how much they will receive. In recent years, pension plans have been changing to that of the "defined contributions type" (Braunstein and Welch, 2002) where the amount received at retirement is dependent on how much one has contributed into the pension scheme during their working years. Also, recent changes in the UK have required new employees to be automatically enrolled into defined contribution pension schemes unless they specifically request to opt out. This means that individuals have to cope with making increasingly complex financial decisions with regards to retirement planning. However, there has been much concern about whether individuals are financially literate enough to deal with such complex financial decisions in pension planning (Banks and Oldfield, 2007).

People's financial literacy and capability can also affect the financial services and products market. University students with higher levels of financial knowledge were found to be more responsible in using their credit cards (Robb, 2011). Having a more financially literate and capable population can also improve the efficiency of the financial products market as consumer participation rates increase (Gnan et al, 2007; Braunstein and Welch, 2002; FINRA, 2013). This might then increase competition amongst different financial product providers and motivate them to develop new financial products and services better suited to the needs of consumers (Grohmann et al, 2014a). This can lead to more competition, innovation

and improvement of financial products and services over time. The efficient operating and expansion of financial markets can also help to stimulate economic growth.

1.4 Low levels of personal financial knowledge

The results from numerous studies which measured people's financial knowledge have implied that worldwide, many could have low levels of financial literacy and capability (OECD, 2005; Lusardi and Mitchell, 2011b). In a survey carried out in Australia, 49% of respondents could not answer a set of simple questions about their bank statements correctly (ANZ and Roy Morgan Research, 2003). In 2008, 41% of American adults rated themselves as having low levels of personal finance knowledge (The National Foundation for Credit Counseling, 2009). Many Americans were found to have a poor understanding of interest rates and debt contracts (Emmons, 2005). The UK baseline survey of adult financial capability carried out in 2005 found that the majority of the adults surveyed did not make retirement plans nor had savings for emergencies (Financial Services Authority, 2006c, 2006d). Similarly, many in the UK were found to lack the knowledge and skills needed to make sound decisions for pension plans (Whitehouse, 2000; Financial Services Consumer Panel, 2001, 2003a, 2003b).

Atkinson and Messy (2012) studied the financial knowledge, behaviour and attitudes of a sample of adults from fourteen countries and found that a large proportion lacked basic financial knowledge as well as demonstrated poor levels of "desirable" financial behaviour. Other studies had similar findings (Lusardi and Mitchell, 2007; Lusardi, 2008; Lusardi and Tufano, 2009; Sekita, 2011; Klapper and Panos, 2011; Lim et al, 2013; Lusardi and Mitchell, 2014; Mahdavi and Horton, 2014; Mbarire and Abdullah, 2014). Some findings revealed disparities between what people thought they knew and what they actually knew. In an

Australian survey, 67 per cent of respondents indicated that they knew what compound interest was, but only 28 per cent were able to solve a problem involving compound interest correctly (ANZ and Roy Morgan Research, 2011). In an American study, more than 50% of the respondents rated themselves to have very high levels of financial knowledge, but when tested, the average overall score achieved was only about 30% (Lusardi and Tufano, 2009).

There has been much concern about the financial literacy of young people, particularly with university students. Cude et al (2006) found that there were low levels of financial knowledge and skills in a group of American university students. Beal and Delpachitra (2003) found that some Australian university students had poor financial decision-making skills and little knowledge about insurance. Chen and Volpe (1998) conducted a personal finance knowledge survey with undergraduates from an American university and found that the overall average score was only 53%. Danes and Hira (1987) found that American university students were aware of general money management topics but lacked specific financial knowledge, such as costs involved in using credit cards. In the 6th biennial countrywide survey of high school American students' financial knowledge and skills, Mandell (2009a) found that the overall average score of 48.3% was the lowest amongst the results of all the surveys the Jumpstart Coalition has ever conducted since 1997 which suggested that financial knowledge has been declining year-on-year. Lusardi et al (2010) estimated that less than one-third of young Americans were able to answer three basic questions about interest rates, inflation and risk diversification correctly.

1.5 Financial education: the presumed silver bullet

Since the beginning of this century, we have seen increasing efforts made to emphasise the importance of financial education, which has been deemed to be a direct solution to the

problems of low levels of financial literacy and capability. At the international level, the OECD is a leader in advocating this. It has been leading, guiding and coordinating international work on financial education since 2003 when it launched a comprehensive financial education project to analyse the issues and potential consequences of low levels of financial literacy (OECD, 2005).

At the 2006 G8 meeting , finance ministers voiced their support for the provision of financial education to improve financial literacy and capability in all countries. They believed that as developing countries are evolving and liberalizing their financial markets, more people are beginning to participate as investors. Financial education can empower consumers; help them become more proactive, responsible and independent in managing their own finances (Miller et al, 2009). In addition, the increase in the volume of international transactions and the increased mobility of individuals, have also highlighted the need to improve people's financial literacy (G8 Finance Ministers Meetings, 2006).

In 2008, the OECD created the International Network on Financial Education (INFE) as a platform for sharing expertise and knowledge between 200 public institutions from 90 countries (OECD, 2009b). At the same time, the OECD also set up the International Gateway for Financial Education (IGFE), the first global database with information, resources, financial education programs and research findings from various countries. The OECD is the leading organisation in promoting financial education, evaluating its impact and promoting the sharing of information and expertise between different countries

Worldwide, countries who have been concerned about the issue of their citizens' financial literacy and capability, have developed national strategies to improve it. In Australia, the Australian Securities & Investments Commission develops and delivers various initiatives to

improve the financial literacy of Australians (Australian Securities & Investments Commission, 2011). The United States launched a national strategy for financial literacy in 2011 (Financial Literacy and Education Commission, 2011). Table 1 lists the countries who have either already set up a national strategy for financial education or were in the process of implementing one.

Table 1 Status of implementing a national strategy for financial education (Grifoni and Messy, 2012)

National strategy	Count	Countries
Countries that have designed and implemented a national strategy (implementation date)	15	Australia (2011), Brazil (2010), Czech Republic (2010), Ghana (2009), India (2006/2010), Ireland (2009), Japan (2005), Malaysia (2003), Netherlands (2008), New Zealand (2008, 2010), Portugal (2011), Slovenia (2011), Spain (2008), United Kingdom (2003), United States (2006, 2011)
Countries that have started considering and/or designing a National Strategy	21	Canada, Columbia, Estonia, Indonesia, Kenya, Latvia, Lebanon, Malawi, Mexico, Peru, Poland, Romania, Serbia, South Africa, Sweden, Tanzania, Turkey, Uganda, Russian Federation, Thailand, Zambia

1.5.1 Importance of financial education for children and young people

The need for adults to be financially educated has also given rise to concerns about the provision of financial education for children and young people worldwide (Financial Services Authority, 2000b, 2004b, 2005a; Billimoria et al, 2013). Financial education for the young is essential and more effective in their early years (Elliott et al, 2010). It should begin as early as possible and ideally be carried out in schools (Cutler,1997; OECD, 2005; Mandell, 2009b). This is especially important because children's habits and behaviour with money can be formed when they are very young and can be hard to change later (Berti and Bombi, 1981; Kempson et al, 1994; Whitebread and Bingham, 2013). Most people's financial behaviour is normally established around the age of 15 (Money Advice Service, 2013b) and the

knowledge acquired in adolescence can be useful even later in adulthood when people have to make more financial decisions (Whyley et al, 1997).

There have been many reported benefits of financial education. After receiving financial education, some young people were found to have a significant increase in financial knowledge (Langrehr and Mason, 1978; Davis et al, 2006; Lührmann et al, 2012; Gill and Bhattacharya, 2014), self-efficacy (Davis et al, 2006) and interest about financial matters (Lührmann et al, 2012). They also demonstrated more responsible financial behaviour (Brock, 2014) such as making fewer impulse purchases (Lührmann et al, 2012). In the long run, they saved more than those who did not receive mandatory financial education (Bernheim et al, 2001). Financial education is critical to the development of adolescents as it ensures that not only are they taught the right knowledge, they also develop desirable attitudes which can lead to better money management practices (Financial Services Authority, 2006a).

Many research studies have found that parents are often the key financial educators for their children (Webley and Nyhus, 2006; Shim et al, 2010; Chowa and Despard, 2014; ifs University College, 2014) and a worrying finding was that children and young people could follow both the good and bad financial behaviours of their parents (Money Advice Service, 2013b). In addition, parents' financial advice might be based on experiences related to a different financial landscape, which could be quite different from what their children might experience in future (OECD, 2012). Most parents feel confident about teaching their children about managing money but agree that schools make better financial educators than themselves (Capital One, 2011).

The experiences that children and young people could gain at home with regards to financial decisions vary depending on the family's socio-economic status, which again emphasises the need for financial education to be taught in schools. For instance, Abramovitch et al (1991) found that children who did not receive allowances were likely to spend more money on credit as compared to receiving cash for making purchases. The Financial Services Authority (2000a) found that children from less affluent families were less familiar with bank accounts and services compared to those from more affluent families. On the other hand, children from more affluent families were less aware of cash-based budgeting and bill paying practices compared to those from less affluent families. Appleyard and Rowlingson (2013) found that children from families with different socio-economic backgrounds had different knowledge about sources of income.

There is some evidence that children in the UK receive and manage their own money. It was estimated that about 97% of Britain's 12 to 19 year-olds received money from sources such as pocket money, gifts and doing chores (The Royal Bank of Scotland Group, 2011). Another study estimated that about 98% of 11 to 17 year-olds managed their own money (Personal Finance Education Group, 2010b).

As young people reach the end of compulsory education and become closer to becoming "adults", the number of financial decisions that they have to make increases exponentially. They can be overwhelmed by financial decisions such as investing in education, moving out and applying for jobs and loans. Many of them might need to apply for loans to finance further or higher education. Some might be moving out of the family home. Others take on part-time work, apprenticeships and internships.

Some research findings suggested that many young people lack the knowledge and skills to deal with managing loans and credit. For instance, it has been reported in the UK that about 22% of 18 to 25 year-olds know nothing about credit ratings, and this gap has caused them problems such as getting access to credit, getting a mobile phone contract and even employment (Money Advice Service, 2014b). It has also been found that many young people lack the confidence to manage money (Towson, 2013) and a UK study estimated that in 2003, about 57% of 16-18 year-olds did not feel that they were capable of managing their own money (Financial Services Authority, 2004b).

In summary, financial education in primary and secondary schools is likely to benefit children and young people by teaching them the basic financial knowledge and skills, as well as help them develop the desirable attitudes that are beneficial for effective money management. Schools can provide a common platform for students to help them understand and evaluate different types of financial information. By receiving financial education along with other students of different backgrounds, young people can improve their awareness about the relationship between financial decisions and one's personal circumstances (Great Britain, Department for Children, Schools and Families, 2008). These lessons will go a long way to prepare them for bigger and more complex financial decisions in adulthood.

1.5.2 Support for financial education in schools

There is a clear and undisputed need for children and young people to receive financial education (McCormick, 2009). Worldwide, there has been much attention given to the provision of financial education for the young. In the United States, 89% of a group of adults surveyed felt that financial education should be taught in schools (FINRA, 2013). Since 1997, the United States has been active in campaigning for compulsory financial education to be

provided in schools from kindergarten to Grade 12. In 2012, fourteen states in America required students to take a personal finance course in order to graduate from high school (Council for Economic Education, 2012). Since 1995, the Jump$tart Coalition for Personal Financial Literacy in America has received the support of various national, private and public organisations to promote financial education from kindergarten to university. It has established 49 affiliated state coalitions to look after schools' needs in terms of standards and content for teaching financial education. They have also been aggressively pushing for the testing of financial knowledge, having done so six times over ten years using a financial knowledge and skills test (Mandell, 2009a).

In the UK, the concern for children's financial education began as early as in 1998, when the FSA was given the statutory responsibility to implement consumer education (Financial Services Authority, 1998). In particular, it was highlighted in the consultation process that children should leave school with a basic level of financial literacy, so that they would have "the knowledge, skill base and the understanding necessary to build on when the time comes to make their own financial planning decisions" (Financial Services Authority, 1999:10). Financial education for the pre-16s in England has served the general purpose of helping young people acquire skills, knowledge, understanding and responsibility in personal finance matters (England and Chatterjee, 2005). It was envisioned that all children and young people would be given financial education so that they would have more skills and confidence in managing money when they left school (HM Treasury, 2007).

Financial education for children has been included in the UK's National Curriculum as a non-statutory learning unit since 1999 (Great Britain, Department for Education and Employment, 2000; Great Britain, Qualifications and Curriculum Authority, 2007a; 2007b;

2007c; 2007d). It was mostly taught in the Personal, Social and Health Education (PSHE) syllabus for primary schools and Personal, Social, Health and Economic Education (PSHEE) syllabus for secondary schools. Personal finance topics taught in UK primary schools usually include recognising different coins and notes, comparing different amounts of money and understanding the need to save money. Personal finance topics taught in UK secondary schools usually include knowledge about consumer rights and responsibilities, knowledge about different forms of payment methods, knowledge and skills about budgeting and knowledge about earnings, benefits and student finance matters (Financial Services Authority, 2002). The Personal Finance Education Group (PFEG), a non-profit charity was established in 2001 to support and provide UK schools with the resources and training for financial education.

In 2003, the FSA launched a national strategy for financial literacy and capability in the UK (Financial Services Authority, 2004a). Schools and young adults were two of the seven areas of priorities identified. The UK government embarked on several initiatives to improve young people's financial literacy. For instance, development work was carried out to include financial education in the secondary school Mathematics curriculum (Great Britain, Department for Education and Skills, 2005).

There was a clear intent on raising the profile of financial education in the national curriculum. The FSA set aside £16 million for a five year project called "Learning Money Matters", to enable PFEG to reach out to at least 1.8 million young people in 4,000 secondary schools in the UK (Financial Services Authority, 2006c; Financial Services Authority, 2006a). The HM Treasury also committed £11.5 million to fund "My Money", an initiative which was carried out from 2008 to 2011 which targeted all children and young

people between 4 and 19 years-old (HM Treasury, 2007; HM Treasury and Financial Services Authority, 2008).

Other governmental policies were introduced to support the provision of financial education for children. For instance, economic well-being was one of the five broad outcomes under "Every Child Matters" framework. Kelly (2005) emphasised the importance of personal finance education for young people aged 14 to 19, and urged the government to develop better support for personal finance education in the secondary maths curriculum. In the 2005 pre-budget report, the UK government declared that some aspects of personal finance would be included in the functional maths component of the GCSE mathematics curriculum from September 2010 (HM Treasury, 2005; HM Treasury and Financial Services Authority, 2008).

In 2013, alongside with changes in the UK's National Curriculum, the Department for Education (DFE) announced that financial education would become compulsory for all state primary and secondary schools beginning in September 2014. It has since been integrated into the primary school mathematics curriculum and citizenship curriculum in secondary schools (Knapman, 2013). This resulted from much lobbying by the All-Party Parliamentary Group (APPG) on Financial Education for Young People, which was formed in 2011 and is currently the second largest APPG in England.

1.6 Statement of the problem

1.6.1 The need to measure financial literacy and capability

Since much resources and efforts have been invested in financial education, many governments and organisations have attempted to measure people's financial literacy and capability (ANZ and the Social Research Centre, 2008; Monetary Authority of Singapore,

2005a; Moore, 2003; Atkinson and Messy, 2012) and have used the findings to provide evidence about the impact of financial education programs (United States Government Accountability Office, 2011). In the UK, there was a commitment of £90 million to improve financial literacy between 2006 and 2011 by the FSA (National Audit Office, 2007). This further emphasised the need to measure the impact of these initiatives (Fox et al, 2005; Atkinson, 2008).

Such measurement studies are essential to improve the provision of financial education if we wish to assess its efficacy. Better measurement can help financial educators design more effective and targeted financial education programs (Money Advice Service, 2012). Many countries like Australia and the United Kingdom have carried out baseline surveys to monitor and evaluate the efficacy of national strategies. These surveys highlighted areas which contributed to low levels of financial literacy and/or knowledge and substantiated the need for more intervention efforts (Menzies, 2013; Atkinson and Messy, 2012). For instance, the UK's adult baseline financial capability survey conducted in 2005 found that those who were younger (aged 18 to 35), were less able to make ends meet and make financial plans for their future (Financial Services Authority, 2006d). The recent findings of the financial behaviours and attitudes of a group of 15 to 17 year-olds in the UK (Money Advice Service, 2013b) highlighted areas of strengths and weaknesses in their financial behaviour.

Many scholars have also highlighted the need to carry out studies that focus on developing valid and reliable ways of measuring financial literacy and capability (Marcolin and Abraham, 2006; Huston, 2010). Atkinson (2008) stressed the need to have well-designed data collection instruments that are appropriate to the target groups. Developing assessment instruments which are not linked to a specific financial education curriculum can promote

international comparative studies (Jang et al, 2014). The OECD has voiced its support for having valid measures of financial literacy to support the financial education movement. Such findings can help "to identify financial skills and knowledge most lacking among consumers and to establish a baseline measurement of financial literacy with which to assess the effectiveness of financial literacy programmes" OECD (2005:42). Recognising this need for measuring financial literacy, at least half of the OECD countries have conducted measurement exercises of financial literacy since 2003 (OECD, 2005).

1.6.2 Lack of knowledge about young people's financial literacy and capability in the UK

Currently in the UK, research about young people and personal finance has focused mainly on their habits, behaviours and attitudes to money (The Royal Bank of Scotland Group, 2011; ifs University College, 2014), but so far, there has not been any scholarly research conducted which objectively measured their levels of financial knowledge. Between 2007 and 2011, The Royal Bank of Scotland Group (RBS) commissioned an independent panel research program to examine the annual patterns of young people's behaviour and attitudes in managing money (The Royal Bank of Scotland Group, 2010; 2011; 2012; 2013). The findings revealed, for example how much money young people received in the form of pocket money, whether they had a budget and how important they felt financial education was. However, there was no further research done to find out how much young people actually knew about various personal finance topics.

Other research evaluated the provision of financial education for children and young people (Financial Services Authority, 2002; 2006e, Ofsted, 2008, All-Party Parliament Group on Financial Education for Young People, 2011; Formby et al, 2011; Appleyard and Rowlingson, 2013), but did not measure levels of financial knowledge and skills.

Research findings about young people's financial literacy and capability can have the potential to support the country's policies. In the United States, policymakers have reacted to various findings (Mandell, 2009a) and as a result, some states have made personal finance education a mandatory course in order to graduate from high school (Council for Economic Education, 2012).

In 2012, the OECD launched a new "financial literacy module" as part of the Programme for International Student Assessment (PISA). The introduction of this assessment module by the OECD was an acknowledgement about the importance of financial literacy as a life skill for young people worldwide. PISA is a triennial international survey organised by OECD since 2000. In each exercise, samples of fifteen-year-old students from randomly selected schools in participating countries take tests to assess their knowledge and skills in reading, mathematics and science subjects. The test questions in PISA are designed to assess how well students can apply their knowledge to real-life situation and the extent to which they are prepared for participation in modern society. PISA findings have had huge influences on education policies in some countries, including the UK. However, the OECD does not reveal the actual test questions used in their tests. It normally compares results between countries.

The PISA financial literacy module was added as an optional module in both the 2012 and 2015 research exercise. The UK did not take part in the financial literacy assessment module for the 2012 PISA exercise but it participated in the 2015 exercise (Personal Finance Education Group, 2012). Until the 2015 results are published, we have very little evidence about how financially literate and capable young people in the UK actually are.

1.6.3 Lack of suitable measurement instrument

At the time when the research commenced, there was not a suitable instrument available for measuring the financial literacy of fifteen-year-olds in the UK. As the financial landscape and environment in the UK are different from other countries, instruments developed for another country might use terms and contexts which are unfamiliar to UK residents. There might also be significant national and cultural differences about what personal finance topics are relevant to people (Nicolini et al, 2013). Hence, the first contribution of this study was to design a suitable instrument which could be used to measure the key aspects of young people's financial literacy in the UK. The questions would only measure what is expected of fifteen-year-olds in the UK.

Having such an instrument will be useful for research purposes and for UK schools. The findings will also contribute to the field with new research knowledge about the key aspects of young people's financial literacy, as well as its correlates. This instrument will also have the potential to be used by UK schools as well as encourage further research efforts in the field of financial literacy. Finally, such findings will also be useful for supporting policies aimed at improving young people's financial literacy and capability.

1.7 Research objectives and questions

The first objective of this study was to develop a UK based instrument which would then be used to measure the key aspects of young people's financial literacy. There were three sections in the instrument. The first section was a personal finance test which measured financial knowledge and skills. The second section was a self-assessed survey which measured financial attitudes. The third section was a questionnaire for collecting background information about the respondents. This section was formulated specifically to

facilitate the analyses of the relationships between components of financial literacy and other background variables.

The second objective was to use the final instrument and collect data which would help us gain a better understanding about the key aspects of fifteen-year-olds' financial literacy. In this study, financial literacy was perceived to be made up of financial knowledge, skills and attitudes.

The third objective was to understand the relationships between these aspects of financial literacy and other background variables which were: personal characteristics, educational variables and family related variables. As this was a cross-sectional research design which did not assume causality, these variables were perceived as potential correlates rather than determinants of financial literacy.

Finally, the data collected by administering the final instrument were used to address the following research questions:

1) Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of financial knowledge and skills were found in them based on their performance on the personal finance test?

    a. Which independent variables were significantly correlated with financial knowledge and skills and what was the extent of these relationships, if there were any?

2) Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of desired financial attitudes were found in them based on the results of the financial attitudes survey?

a. Which independent variables were significantly correlated with financial attitudes and what was the extent of these relationships, if there were any?

3) Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what was the extent of the relationships, if any, between their financial knowledge and skills; and their financial attitudes?

1.8 Outline of the thesis

The first chapter introduces the topics of financial literacy, financial capability and financial education. Next, the rationale for carrying out the research is highlighted by describing the problems and gaps in the existing literature. This leads to the research objectives and questions.

The second chapter reviews the relevant literature on the conceptualisation of financial literacy and capability as well as provide an analysis of other financial literacy surveys. It then presents the findings about the correlates of aspects of financial literacy that were found in previous studies.

The third chapter describes the main part of the research methodology by detailing how the survey instrument was designed.

The fourth chapter describes the other practical aspects of the research methodology, such as the recruitment of research participants; the data collection process as well as methods of statistical analyses.

The fifth chapter presents some relevant findings from the pilot study which helped to refine the final research instrument.

The sixth chapter presents findings from the main study by answering the research questions from Chapter One.

The seventh chapter discusses the implications of the findings. It concludes with an examination of the limitations of the study as well as suggestions for future research.

Chapter Two: Review of the literature

In the previous chapter, there was a brief introduction to the concepts of financial literacy and financial capability. Both have definitions and conceptual frameworks which appear to be similar but conceptually, they are different. This chapter begins by examining the various definitions and conceptual frameworks of financial literacy. There is a discussion of how the OECD's and the FSA's frameworks were both relevant to this research. Next, the key aspects of financial literacy will be presented. This leads to an analyses of the methods used in various studies for measuring financial literacy. The last section presents and discusses the findings from other studies which have highlighted the possible correlates of financial literacy.

2.1 Financial literacy

The concept of financial literacy came about as a result of international concerns about people's ability to manage their personal finances in an increasingly complex financial environment, both in developed and less developed economies. Given the high levels of concern for people's financial literacy, substantial efforts have been made to measure it. The reasons for doing so include being able to track levels of financial literacy over time and compare levels across countries; to measure the efficacy of new financial education initiatives and to ascertain whether financial education brings about long term benefits. Since the measurement results can have a major impact on policies related to financial education and the regulation of financial market players, it is important to have a healthy debate and discussion about the conceptualisation of financial literacy.

Perceptions of financial literacy are constantly evolving and the views of various scholars reflect that (Robb, 2012). There are many versions of its definition and they vary in depth

and emphasis. Currently, a standard definition does not exist (Hung et al, 2009; Huston, 2010; Remund, 2010; Robb, 2012). A list of definitions is presented in Table 2.

One of the earliest definitions of financial literacy from the UK was by Noctor et al (1992:4) as quoted in the Financial Services Authority (2005b:13). It defined financial literacy in behavioural terms, which is "the ability to make informed judgements and to take effective decisions regarding the use and management of money". Other definitions included more specific and measurable aspects such as the types of skills needed. For instance, Vitt et al (2000:2; 2005:7) defined financial literacy as:

"The ability to read, analyse, manage and write about the personal financial conditions that affect material well-being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future and respond competently to life events that affect everyday financial decisions, including events in the general economy"

Various conceptual models of financial literacy have been proposed. One of the earliest models was put forth by Mason and Wilson (2000) who argued how financial literacy is merely an extension of basic literacy. In their opinion, financial literacy referred to a specific set of knowledge and skills that enabled people to use relevant financial information to make effective financial decisions. People's financial literacy can be influenced by their skills, the availability of technologies, the availability of other resources and contextual factors.

Others have tried to extend this simplistic concept of financial literacy. According to Davies (2015), in addition to knowledge, skills and attitudes, it also includes an understanding of the financial and political environment; for example one can make better financial decisions if one has the knowledge and understanding of the political climate involving the financial

behaviour of banks and governments. Balatti (2007) emphasised the importance of the social capital dimension of financial literacy which refers to how different social networks affect people's knowledge, skills and attitudes towards personal finance. Other dimensions of financial literacy often discussed in the literature include: "global understanding" (Council for Economic Education, 2005) "worldview" (Lusardi and Mitchell, 2007), "the individual's sense of workplace satisfaction" (Hira and Loibl, 2005), defense against fraud (U.S Department of Treasury, Office of Financial Education, 2006; U.S Department of the Treasury, Office of the Comptroller of the Currency, 2014), ability to manage debt (Stone, Wier and Bryant, 2008:12; Gross, Ingham and Matasar, 2005:12) and "consumer credit literacy" (Courchane et al, 2008).

The lack of a standardised concept for financial literacy is problematic (Hung et al, 2009; Huston, 2010; Remund, 2010). As Remund (2010) pointed out, if common conceptual and operational definitions of financial literacy are yet to be determined, it can be challenging to evaluate and assess financial literacy appropriately. Also, since many of the instruments measuring financial literacy are different, their results cannot be compared. Instruments whose fundamental conceptualisations are different raise doubts about their validity and usefulness.

As can be seen from Table 2, most definitions of financial literacy have conceptualised it as a form of human capital which includes attributes such as knowledge, skills and attitudes. Hence, it is unsurprising that many are in support of the provision of financial education which aim to improve these aspects. Financial education is a process which helps people gain the relevant knowledge and skills that they need in order to make sound financial

decisions (Hung, Parker and Yoong, 2009). It can also help to influence and change people's behaviour, attitudes and confidence (OECD, 2005a).

As financial education is a didactic approach which is mainly concerned with the provision of information and empowering people with knowledge, many have regarded financial knowledge to be synonymous with financial literacy. Financial knowledge was used by many economists as a proxy for financial literacy (Chen and Volpe, 1998; Alessie et al, 2011; Almenberg and Säve-Söderbergh, 2011; Bucher-Koenen and Lusardi, 2011; Fornero and Monticone, 2011; Gerardi et al, 2010; Klapper and Panos, 2011; Lusardi and Mitchell, 2011a; Sekita, 2011; Agnew et al, 2013). The questions found in these studies often test people's knowledge about basic financial concepts such as simple and compound interest, risk and return and inflation (Lusardi and Mitchell, 2006; Delavande et al, 2008; Huhmann and Mcquity, 2009; Kharchenko, 2011; Atkinson and Messy, 2012). There is no doubt that financial knowledge is a key component of financial literacy. But to equate financial literacy with financial knowledge is a narrow view about financial literacy and this has made some scholars uncomfortable (Robb, 2012).

Table 2 Definitions of financial literacy

Source	Definition
Noctor et al (1992:4) *as quoted in Financial Services Authority (2005b:13)*	"The ability to make informed judgements and to take effective decisions regarding the use and management of money."
Mason and Wilson (2000:31)	"An individual's ability to obtain, understand and evaluate relevant information necessary to make decisions with an awareness of the likely financial consequences."
Vitt et al (2000:2; 2005:7)	"Personal financial literacy is the ability to read, analyse, manage and write about the personal financial conditions that affect material well-being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future and respond competently to life events that affect everyday financial decisions, including events in the general economy."
Davies (2002:18)	"The knowledge, skills and attitudes necessary to become a questioning and informed consumer of financial services and the ability to manage one's finances effectively."
G8 Finance Ministers Meetings (2006)	"Financial literacy can be defined as the capacity to sufficiently understand financial market concepts and risks in order to make informed choices, to identify and avoid financial abuse, and to take other effective actions to improve well-being."
Jumpstart Coalition for Personal Financial Literacy (2007:1)	"The ability to use knowledge and skills to manage one's financial resources effectively for lifetime financial security. Financial literacy is not an absolute state; it is a continuum of abilities that is subject to variables such as age, family, culture, and residence. Financial literacy refers to an evolving state of competency that enables each individual to respond effectively to ever-changing personal and economic circumstances."
Servon and Kaestner (2008: 273)	"Financial literacy refers to a person's ability to understand and make use of financial concepts."
Hung et al (2009:11)	"Knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being."
Huston (2010:306)	"How well an individual can understand and use personal finance related information."
Remund (2010: 284)	"Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions."
Task Force on Financial Literacy, (2010:10)	"Having the knowledge, skills and confidence to make responsible financial decisions."
British Columbia Securities Commission (2011:2)	"Financial literacy means having the knowledge, skills and confidence to make informed and sound financial decisions."
Gathergood (2011:2)	"Consumer understanding of financial concepts and ability to correctly interpret financial data."
Mastercard Worldwide Insights (2011:2)	"The level of basic money management skills in terms of budgeting, savings, and responsibility of credit usage; the level of knowledge of financial products, services and concepts and ability to plan for long-term financial needs; basic understanding of the various risks associated with investment, different investment products and skills required."
Atkinson and Messy (2012:14)	"Financial literacy is a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing."
OECD (2012:13)	"Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life."
Lusardi and Mitchell (2014:6)	"People's ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt and pensions."

Huston (2010) conceptualised financial literacy by examining how it has been measured in various studies. Based on her review, she concluded that financial literacy should be regarded as a subset of overall human capital with two main dimensions: knowledge and application. Her review showed that financial knowledge commonly referred to the basics of money, borrowing of money, investments and insurance. This (financial knowledge) was most likely acquired through education and/or experience. The application dimension referred to one's ability and confidence to apply financial knowledge. Her model explained that financial literacy can be improved through the provision of personal finance education, and other investments in education and general learning that affect human capital.

However for young people, these conceptual models and definitions might not be entirely relevant. Many have yet to reach the legal adult age and might not have taken on most of the financial responsibilities faced by working adults. In this respect, the OECD framework for examining young people's financial literacy becomes the key reference when constructing a personal finance test for young people.

2.2 The OECD's PISA financial literacy framework

The OECD published a framework of financial literacy (OECD, 2012) for the purpose of explaining the rationale behind the design of a financial literacy test module in the 2012 Programme for International Student Assessment (PISA). The purpose of the assessment was to provide evidence about young people's competency to apply knowledge and skills in various domains of personal finance.

Based on the context for young people aged about fifteen-year-olds, the OECD (2012:12) defined financial literacy as:

"Financial literacy is knowledge and understanding of financial concepts, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life."

In the OECD's framework, knowledge, skills and attitudes are the main elements of financial literacy. These are also found in the FSA's financial capability model. However, the two models are meant for different groups of people. The OECD's model is more relevant to young people who have fewer life experiences and opportunities to make financial decisions, compared to adults.

OECD (2012) described four broad categories of knowledge and skills which young people should possess. These were:

- Money and transactions (MT)
- Planning and managing finances (PMF)
- Financial risk and rewards (FRR)
- Financial landscape (FL)

Four groups of cognitive processes were deemed relevant to the context of personal finance. The first group of processes referred to how an individual can identify and recognise relevant financial information. The second group referred to how an individual can analyse financial information. This involves cognitive skills such as interpreting, comparing, contrasting, synthesising and extrapolating information. The third group referred to how an individual can evaluate financial questions or issues by drawing on knowledge and understanding. This involves cognitive skills such as explaining, assessing and generalising. The fourth group

referred to the application of financial knowledge and understanding. This usually involves problem solving and performing numerical calculations.

The third main element in the OECD's definition for financial literacy was about the importance of non-cognitive attributes such as motivation and the confidence to apply financial knowledge and skills in financial matters. These non-cognitive attributes can support the application of financial knowledge and skills as well as influence financial decision making.

The OECD's framework is relevant for fifteen-year-olds worldwide. However, in the case of the UK where the long term objective is to help people become financially capable, the FSA's financial capability framework should be considered as well.

2.3 The UK's FSA financial capability framework

In 2004, the FSA embarked on a project to design a comprehensive baseline survey which was used to measure what the FSA chose to call "financial capability" amongst UK adults in 2005. "Financial capability", as described by the FSA, referred to a specific set of knowledge, skills and attitudes that empower one in managing personal finances (Financial Services Authority, 2005b). A financially capable person can effectively "make ends meet"; "keep track of finances"; "plan ahead"; "choose financial products" and "stay informed about financial matters" (Financial Services Authority, 2004a).

In the FSA's conceptual framework, there are three main elements of financial capability: knowledge and understanding; skills; confidence and attitudes (Financial Services Authority, 2005b). These can be acquired through various channels: experience; education; friends and family; the media, and information materials provided by the financial sector, regulatory authorities and other sources. The acquisition of knowledge and understanding is dependent

on life events and existing knowledge. When making a financial decision, one might attempt to improve knowledge or to draw on what was previously learnt. One's financial knowledge constantly evolves due to changes in one's circumstances and experience.

The FSA's model identified six main areas of knowledge and understanding:

- Types of money and payment methods
- Ways to acquire income
- Ways to spend money
- Concepts of risk, interest, inflation and probability
- Understanding of financial products
- Knowing which institutions provide financial advice and redress, and knowing sources of financial information

(Financial Services Authority, 2005b)

Skills are necessary to apply knowledge and understanding, in order to make sound financial decisions. The FSA's model identified three pertinent sets of skills. The first set referred to the ability to gather financial information and to keep records of financial transactions. The second set referred to the ability to plan savings, expenditure, and to budget for future expenses. The third set referred to the ability to evaluate financial information and to compare different financial products. Overall, attitudes affect the extent to which people use their knowledge, understanding and skills effectively.

In summary, Figure 2 shows how the FSA perceived the relationships between the elements of financial capability and external variables.

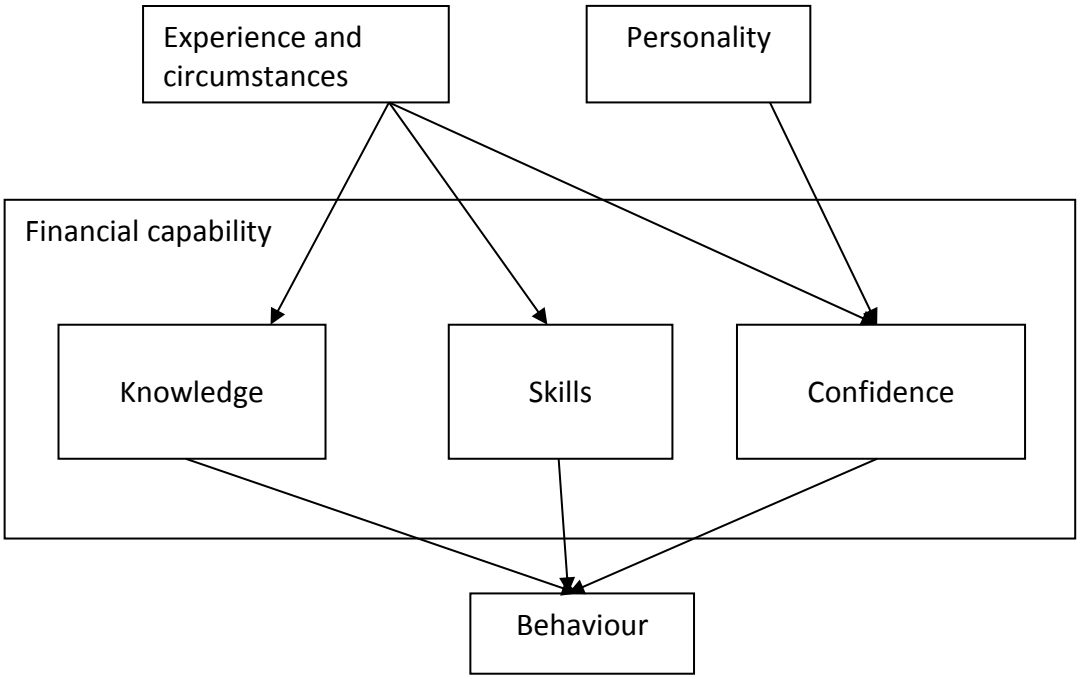


Figure 2 Financial capability in the information and advice environment (Financial Services Authority, 2005b)

2.4 Financial knowledge

In the field of personal finance, financial knowledge includes knowledge about topics such as interest rates, credit, insurance, risk and taxes (Great Britain, Department for Education and Employment, 2000; Hogarth et al, 2002; Davies, 2002; Vitt et al, 2005). Hogarth et al (2002) pointed out the importance of understanding the time value of money in investments. The National Association of Citizens Advice Bureaux (2001) stated that adults should be able to understand payslips. Lusardi and Mitchell (2006) felt that having basic knowledge about interest rates, inflation and principle of portfolio diversification is essential for consumers of financial products. The Basic Skills Agency (2004) identified three areas of knowledge and understanding: different forms of money and methods of payments, generating income, and using income. The Financial Services Authority agreed with this list and added on the following: concepts about risk, interest, inflation and probability; types of financial products; sources of financial information, advice and redress (Financial Services Authority, 2005b).

Personal financial knowledge can also be about good financial practices, for example, being knowledgeable about practices associated with managing money, financial assets and investments (Borden et al, 2007).

The types of financial knowledge expected of young people to have differ somewhat from that expected of adults. Based on an analysis of literature related to youth financial literacy, Totenhagen et al (2014) found that these topics were most frequently highlighted as essential topics: budgeting and saving; investing; credit and financing; taxes; insurance; banking and financial services; goal setting; fraud and identity theft.

In the UK, evidence about the financial knowledge of young people is scarce. Various survey findings suggested that young people (aged 25 and below) might have low levels of financial knowledge. In a survey carried out by PFEG and Barclays Bank, 33% of a group of under 25 year-olds could not explain what annual percentage is (Clarke, 2013). A survey conducted by the Personal Finance Education Group in 2010 found that more than 50% of the 11 to 17 year-olds surveyed did not know how a credit card works (Personal Finance Education Group, 2010b). A study carried out by the ifs University College estimated that only about 50% of 15 to 17 year-olds felt they had sufficient financial knowledge to deal with personal financial matters (ifs University College, 2014).

2.5 Financial skills

Skills related to financial literacy can be day-to-day money management skills and the ability to make appropriate financial decisions (Schagen and Lines, 1996; Great Britain, Department for Education and Employment, 2000; Remund, 2010; Carpena et al, 2011). Communication skills are necessary to discuss about financial matters (Remund, 2010; Vitt et al, 2000), find information (Financial Services Authority, 2006b), seek alternatives and get professional help

(Carpena et al, 2011). Other skills include: problem solving (National Association of Citizens Advice Bureaux, 2001; Schagen and Lines, 1996), budgeting (Davies, 2002), financial planning (Davies, 2002; Schagen and Lines, 1996) and being able to weigh up risk and reward (Davies, 2002; OECD, 2009a). According to the National Association of Citizens Advice Bureaux (2001), being financially literate helps people to choose the right mortgage, utility suppliers, pension schemes and loan products. Even practical skills like being able to read and complete benefit and tax forms were deemed to be important.

According to OECD (2012), the skills that were expected of young people in financial contexts were: being able to identify financial information; analyse information in a financial context; evaluate financial issues and; apply financial knowledge and understanding. Tasks related to identifying financial information can be for instance, identifying the information on a payslip. Analysing information in a financial context often requires more than one type of skills. These include: interpreting, comparing, synthesising and deducing from the information provided. Evaluating financial issues can require skills such as explaining, reasoning and generalising.

To date, there has not been any published research study that has examined the financial skills of young people in the UK. A survey conducted by PFEG and Barclays Bank in 2013 found that when 1800 young adults aged 25 and below were asked to examine a bank statement, only 42% of them could accurately distinguish between being in credit and being overdrawn. Until more research studies are conducted, we know very little about the levels of financial skills in young UK citizens.

2.6 Financial attitudes

Financial attitudes play an important role as part of being financially literate (Atkinson and Messy, 2011; Davies, 2002; Ofsted, 2008). One definition of attitude is "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly and Chaiken, 1993:1). Attitudes cannot be observed directly but can be inferred from "an individual's choice of action toward some object, person, or event" (Gagné and Briggs, 1974:62). Attitudes have also been hypothesised as a set of beliefs regarding an object or situation that can be equated as the response towards the object or situation (Rokeach, 1968). Aiken (2002) described attitudes as "learned cognitive, affective and behavioural predispositions to respond positively or negatively to certain objects, situations, institutions, concepts or persons".

Some attitudes have been considered important as part of the financial literacy construct. Desirable attitudes include: the propensity to save (OECD, 2009a), the desire to plan for long term financial needs (Atkinson and Messy, 2012) and wanting to take responsibility for one's financial decisions on the local and wider community (Davies, 2002). Confidence is also important, so that consumers are able to seek information and clarify details of contracts in order to reduce the likelihood of falling prey to dishonest sellers (Moore, 2003; Financial Services Authority, 2005b).

For young people, appropriate attitudes can be about managing money responsibly, being a questioning consumer of financial products, and having the desire to evaluate information prior to making financial decisions (Great Britain, Department for Children, Schools and Families, 2008). Ofsted (2008) recommended that young people should have the inclination to maximise the use of their money. They should also prioritise their expenses and be willing

to find ways to balance income and expenditure. They should also want to make decisions only after having evaluated the relevant information. They should also be aware that money management is influenced by social, emotional and cultural factors, and hence learn how to manage their spending impulses.

In the UK, some findings suggested that many young people have desirable attitudes towards saving and managing their money. About 90% of a representative sample of 11 to 19 year-olds felt that it was important to learn about managing personal finances (The Royal Bank of Scotland Group, 2012). When it comes to saving money, about 86% of young people aged 11 to 19 felt that saving money is a positive habit (Personal Finance Education Group, 2010b ; The Royal Bank of Scotland Group, 2012). About 82% of 15 to 17-year-olds felt that they should start saving for retirement in their 20s. Around 2009, research carried out by PFEG in the Southeast found that 70% of 11 to 17 year-olds were saving regularly (Personal Finance Education Group, 2010b). The ifs University College (2014) found that in 2013, about 72% of young people aged 15 to 18 saved money every month. The Money Advice Service (2013b) reported that 63% of 15 to 17-year-olds saved regularly every month.

However, there were some attitudes towards debt and credit which were quite worrying. The Money Advice Service (2014a) found that some 16 to 21 year-olds regarded credit as “free money” which implied that some thought that things bought on credit were “free”. 46% of young people aged 11 to 19 year-olds considered mortgages as debt while only 50% considered student loans as debt (The Royal Bank of Scotland Group, 2012).

However, some recent findings indicated that young people have become savvier in terms of spending their money. They often compared prices for expenditures such as clothes, mobile phones and mobile phone tariffs (Financial Services Authority, 2004c). It was found that

between 2007 and 2011, the average monthly expenditure of 11 to 19 year-olds had fallen across the years. 69% would not buy things which they could not afford. There was also a decline in the percentage of those who had spent all the money they received (The Royal Bank of Scotland Group, 2012).

2.7 Young people's financial literacy and capability

Both the FSA's financial capability framework and the OECD's financial literacy framework were used to formulate a hypothetical theoretical framework for this study. The FSA's model describes how people, when equipped with the right knowledge, skills, attitudes and opportunities will be able to exhibit ideal financial behaviours. However, for the under-18s, opportunities to make financial decisions are fewer, compared to adults. Children and young people spend most of their time in schools where they have more opportunities to learn about the basic financial concepts and be made more aware about the attitudes in managing money. Adults on the other hand, spend more time on earning and making financial decisions (Bagwell et al, 2014). Inevitably, young people usually have little experience of the financial opportunities, threats, pressures and responsibilities that they would subsequently experience in adult life. Hence, most young people are unlikely to display many of the behavioural characteristics that the FSA was concerned with, such as the extent of indebtedness or bill paying habits. For example, fifteen-year-olds would not be allowed to apply for credit and loans with financial institutions and hence they would not have much actual experience in managing loans.

Hence for young people, the OECD's model is an important complement to the FSA's model. It has a richer description of knowledge and skills used in managing personal finances which are relevant to young people. The list of topics and test objectives were derived from a study

of common topics found in financial literacy frameworks from various countries, including Australia, Japan, the Netherlands, South Africa and the United States. The model also highlighted the type of environment in which a typical fifteen-year-old is situated, and the type of financial transactions which they might be engaged in. Finally, it recognised that attitudes and confidence play an important role in the construct of financial literacy.

Although there are conceptual differences between financial literacy and financial capability, there is no doubt a close relationship between them. Financial capability can be influenced by many factors including financial literacy. Two individuals can have the same level of financial literacy but different levels of financial capability. However, if we were to hold the other determinants of financial capability constant, what must be true is that it is more desirable to have increased levels of financial literacy than the opposite. Regardless of whether we take the narrow or broad view of financial literacy, we cannot deny that financial knowledge, skills and attitudes are recognised as the key components in both concepts and we cannot underestimate the impact that general education and financial education will have on improving these components which could have a positive influence on overall financial literacy or capability.

Financial capability is a broad concept which focuses on shaping financial behaviours, understanding how people make financial decisions and improving the financial landscape to support that. This has serious implications for policy makers as governmental policies often influence people's lifestyles and consequently their financial decisions. For instance if the government decides to reduce benefits and state pension, there will be increased responsibilities of individuals to make ends meet and plan for retirement. However, when focusing on the needs of children and young people, the term "financial literacy" is more

appropriate. General education in schools, which also includes financial education, plays an important role in shaping their knowledge, skills and attitudes. There are more opportunities for financial education to be delivered in various subjects such as Mathematics, Citizenship and PSHE lessons which can provide young people with a basic level of financial literacy that enables them to become financially capable during their adult years.

Financial capability on the other hand, is more focused on changing financial behaviours that are more likely to be manifested in financially literate individuals who have had the opportunities to experience real-life financial transactions and decision making processes (Fessler et al, 2007). For young people, their financial capability is built up in schools mainly through financial education that focuses on improving knowledge, skills and attitudes. Therefore, an investigation of young people's financial literacy was chosen to be carried out in this research.

2.8 Measuring financial knowledge, skills and attitudes

The use of financial literacy surveys has been the main methodology for the measurement of financial literacy. Data was collected via telephone interviews or in the form of self-completed questionnaires, both in paper or digital format. According to OECD (2005a), there are generally two types of questions found in these surveys. The first type of question measures financial knowledge and/or skills objectively. These questions have a definite right answer. The format of the questions can be in the form of "true/false", multiple-choice or short-answer questions. For instance, in Lusardi et al (2010), young people's financial literacy was measured using three questions adapted from Lusardi and Mitchell (2006). One question was: "Suppose you had $100 in a savings account and the interest rate was 2% per

year. After five years, how much do you think you would have in the account if you left the money to grow?" (Lusardi et al, 2010: 361).

The other type of question requires respondents to do a self-assessment of their financial literacy. One example was "Do you understand the term "compound interest" very well, fairly well, not very well or not at all?" (ANZ and Roy Morgan Research, 2003: 22). Another example was "At this point in your life, is it important for you to learn more about how to manage debt?" (Australian Government Financial Literacy Foundation, 2007: 86). Sometimes, respondents might be asked to rate a statement by indicating the extent to which they "disagree" or "agree". An example was "Money is just a means to buy things" (Australian Government Financial Literacy Foundation, 2007: 77). Respondents might also be asked about their habits and behaviour. For instance, "…in the last 12 months, how often, if at all, have you run out of money before the end of the month?" (Money Advice Service, 2013c:37). Respondents have also been asked to rate their confidence level in managing finances related to various personal finance topics (Godsted and McCormick, 2007).

The results from financial literacy surveys have been analysed in different ways. In surveys which involved objective test questions, there were discussions about the overall mean scores (Chen and Volpe, 1998; Ali et al, 2014) and the percentage of respondents who obtained correct answers for each question (Mahdavi and Horton, 2014). Scores from different domains of financial literacy were also summarised and compared. For example, in the 2005 UK financial capability baseline survey (Financial Services Authority, 2006d), factor scores from the five domains of financial capability measured were compared.

Some surveys included rating scales which described levels of financial literacy based on respondents' overall scores on test questions. According to Danes and Hira (1987) and Chen

and Volpe (1998), those who achieved overall percentage scores of less than 40% should be considered as having “very low financial literacy”; those who achieved overall percentage scores between 40% to less than 60% should be considered as having “low financial literacy”; those who achieved overall percentage scores between 60% to less than 80% should be considered as having “medium financial literacy” and those who achieved overall percentage scores of 80% and above should be considered as having “high financial literacy”. According to Mandell (2009a), those who achieved overall percentage scores of 60% and above in the Jump$tart Survey should be considered “financially literate”, while those who achieved overall percentage scores below 60% should be considered “financially illiterate”.

The topics found in financial literacy surveys varied widely, depending on how the concept of financial literacy has been perceived and the targeted respondents. Some surveys measured mainly investment knowledge of adults (Volpe et al, 1996; Volpe et al, 2002; Wilcox, 2003; Volpe et al, 2006; Müller and Weber, 2008). Some surveys were part of larger household panel surveys (Caretelli and Ricci, 2011; Lusardi and Mitchell, 2006; van Rooij et al, 2011). Some surveys were large scale country-specific surveys (Monetary Authority of Singapore, 2005b; Financial Services Authority, 2006c; Applied Research & Consulting LLC, 2009; Arrowsmith and Pignal, 2010; ANZ and Roy Morgan Research, 2011; Colmar Brunton, 2013). Other surveys focused on topics related to young people (Lytton et al, 1984; Beal and Delpachitra, 2003; Mandell, 2009a; Robb and James, 2009).

Table 3 lists some studies (published before 2012), which used financial literacy surveys designed for young people. The first column indicates the reference to study; the second column shows the year in which the survey was carried out and the third column shows the country where the study was carried out. The fourth to seventh column indicates whether

any of the survey questions belonged to any of the four domains described by OECD (2012): “Money and transactions” (MT); “Planning and managing finances” (PMF); “Financial risk and rewards” (FRR) and “Financial landscape” (FL). The eighth column indicates if attitudes were measured as well. The ninth column indicates the format of the survey (e.g. telephone survey); the tenth column shows the type of test questions asked (multiple choice questions or true/false questions) and the last two columns indicate whether there was any evidence of ensuring the validity and reliability of the survey.

Table 3 Review of financial literacy surveys for young people

Reference	Year	Country	MT	PMF	FRR	FL	A	Survey format	Type of question	Validity	Reliability
Manton et al (2006)	2003	USA	✓	✓	✓			Self-completed paper survey	20 MCQ	Content validation	
Beal and Delpachitra (2003)	2002	Australia	✓	✓	✓			Self-completed paper survey	25 MCQ	Content validation	
Bowen (2002)	1993	USA	✓	✓	✓			Self-completed paper survey	19 MCQ	Questions adapted from other surveys	
Chen and Volpe (1998)	NA	USA	✓	✓	✓			Self-completed paper survey	36 MCQ	Content validation	Internal consistency (Cronbach's Alpha)
Lusardi et al (2010)	2007-2008	USA	✓		✓			Telephone interview (questions part of panel research)	3 MCQ	Questions adapted from other surveys	
Lytton et al (1984)	1980	Kenya		✓	✓	✓	✓	Self-completed paper survey	22 T/F 25 MCQ	Content validation	
Mandell (2009a)	2008	USA	✓	✓	✓			Online survey	31 MCQ		
Robb and Sharpe (2009)	NA	USA	✓		✓	✓		Online survey	6 MCQ	Questions adapted from other surveys	
Symanowitz (2006)	2006	South Africa	✓	✓	✓	✓		Self-completed paper survey	20 MCQ	Questions adapted from other surveys	
Valentine and Khayum (2005)	2003	USA	✓	✓	✓			Self-completed paper survey	36 Q	Questions adapted from other surveys	
Varcoe et al (2005)	2002	USA	✓	✓	✓	✓		Self-completed paper surveys	19 T/F		Internal consistency (Cronbach's Alpha)
Walstad et al (2010)	2006-2007	USA	✓	✓	✓	✓		Self-completed paper surveys	30 MCQ	Questions adapted from other surveys	Internal consistency (Cronbach's Alpha)
Robb and James (2009)	2007	USA	✓	✓	✓	✓			6 MCQ	Questions adapted from other surveys	

In terms of survey content, the majority (ten out of thirteen) included the MT, PMF and FRR domains. Less than half of the surveys included questions which assessed knowledge about the financial landscape. Only one study examined attitudes as well as knowledge and skills (Lytton et al, 1984). Three surveys had less than seven questions while the others had between nineteen to forty-seven questions. The use of self-completed paper surveys was common. The questions were most likely to be in the multiple-choice format and less often to be the true/false type.

Most of the surveys were validated by consulting subject matter experts or by adapting questions used in other studies. Only three surveys used Cronbach's Alpha as a test for reliability or internal consistency. This shows that there was a lack of validity and reliability related evidence for many financial literacy surveys (Despard and Chowa, 2014; Schuhen and Schükmann, 2014) and indicates a need to ensure that considerations for validity and reliability for new instruments should be made.

Upon examination of the questions found in these surveys, unsurprisingly it was found that some questions tested country-specific knowledge. Here are some examples:

“Which of the following statements best describes your right to check your credit history for accuracy?”

a) Your credit record can be checked once a year for free.

b) You cannot see your credit record.

c) All credit records are the property of the U.S. Government and access is only available to the FBI and Lenders.

d) You can only check your record for free if you are turned down for credit based on a credit report.

(Mandell, 2009a: 234)

“Your take home pay from your job is less than the total amount you earn. Which of the following best describes what is taken out of your total pay?”

a) Social security and Medicare contributions.

b) Federal income tax, property tax, and Medicare and social security contributions.

c) Federal income tax, social security and Medicare contributions.

d) Federal income tax, sales tax and social security contribution.

(Mandell, 2009a: 234)

“The IRS form that is used to notify your employer of the number of exemptions for which you qualify and that serves as a basis, along with income earned, for calculating your payroll withholding is the:”

a) W-2 form

b) W-4 form

c) 1040 form

d) exemption certificate

(Bowen, 2002: 100)

Some questions did not appear to have clear and definite right answers. Questions related to the rights of consumers can have different answers depending on the country where the survey was carried out. Also in general, questions about personal beliefs, habits and attitudes do not have “right” or “wrong” answers; they usually fall along a continuum. This highlights one of the challenges of designing objective test questions in financial literacy surveys. Here are some examples:

“If I buy something then decide that I don’t want it, the store has to give me a refund” (True/False)

“Your beliefs and values have little influence on how you spend money” (True/False)

(Varcoe et al, 2005: 67)

There were also questions which used complicated finance and economics jargon which might be too complex for fifteen-year-olds. Here are some examples:

“A dollar-cost-averaging approach to investing involves”

a) buying low and selling high

b) complex calculations of risk and return

c) selling securities to minimize capital

(Chen and Volpe, 1998:125)

“No-load mutual funds are recommended over load funds because investors”

a) do not pay for 12b-1 fees

b) can reduce their tax liability

c) are not charged with sales commissions

d) can avoid the funds’ administrative expenses

e) believe that the funds have no management charges

(Chen and Volpe, 1998:126)

In some cases, the questions tested knowledge where facts might change and were not closely related to managing personal finances. One example is:

"The average non-introductory interest rate on credit card debt is"

a) 10%

b) 15%

c) 20%

d) don't know

(Manton et al, 2006: 53)

Finally, it was noted that most of the questions measured mainly knowledge but not the ability to apply knowledge. Such questions might require some financial knowledge as well as skills such as comparing, calculating, analyzing and budgeting. According to Huston (2010), surveys should include both knowledge and application of knowledge items. With the exception of Lusardi et al (2010), where two out of three questions measured both knowledge and skills; three other surveys measured only knowledge (Bowen, 2002; Varcoe et al, 2005; Manton et al, 2006). For the test in Mandell (2009a), about one third of the questions also required skills, while for Chen and Volpe (1998), only four out of twenty-eight questions tested skills. This indicated a need to ensure that in the test design process, efforts should be made to ensure that there is a fair amount of questions which test one's ability to apply financial knowledge.

2.9 Factors associated with financial literacy and capability

Many studies also examined factors associated with financial literacy and capability. These findings can support intervention efforts and/or policy changes which can improve financial literacy and capability for specific groups of people. Furthermore, they can also emphasise areas where further research are needed to determine causal factors of financial literacy.

For instance, if the majority of such studies were to find a statistically significant and positive relationship between mathematical ability and financial literacy or capability; it would imply a need to examine specifically whether improving mathematical ability could lead to an improvement in financial literacy or capability and vice versa. If it were the case that gender is often highly associated with levels of financial literacy or capability, it would imply a need to have more scholarly discourse and research about the reasons behind such findings. In essence, finding out about the factors associated with financial literacy or capability is an important process which leads to more targeted future research; whose findings can further support policies aimed at improving people's financial literacy or capability.

It is important to emphasize here that simple correlations can be misleading. To take an example from a different field, there could be a strong correlation found between how much someone earns and their family background. That, in itself is interesting. However, it tells us very little about the causal relationship between the independent variables. It could be, for instance, that family background is very strongly related to the amount of education someone receives. A simple correlation that was calculated between earnings and education, therefore, would also be strong. However, to unpick the relative causal contributions of family background and education to someone's earnings would require a more subtle approach, such as using multivariate analyses.

Another key point to take note is that throughout the relevant studies presented, different methods have been used to measure aspects of financial literacy and capability. As shown in the previous section, there was often a large variety in terms of the number of topics and questions in studies which had attempted to measure aspects of financial literacy and capability. This again highlights that there were different views on what financial literacy is

and also suggests that many researchers have their own reasons for ignoring methods that were used in previous studies. It also emphasises the fact that the process of moving towards a universal measure of financial literacy or capability is still a "work in progress" (Holzmann, 2010). Similarly, convenience samples were often used in most studies which looked at aspects of young people's financial literacy. There is also very little evidence on causal factors as most studies would at most attempt to draw associations rather than carry out experiments which might be costly, lengthy and difficult to implement.

Nevertheless, it is an important process to examine these correlates as the findings have helped to support the ones chosen for this study.

2.9.1 Gender

In most studies which involved young people studying in universities, it was found that males had significantly higher levels of financial knowledge than females (Danes and Hira, 1987; Chen and Volpe, 1998; 2002; Beal and Delpachitra, 2003; Lusardi et al, 2010). However, the tests used to measure financial knowledge were all different and the number of questions varied from three to twenty-five. The topics tested were rather similar and usually involve these topics; savings, borrowings, investments and insurance. One weakness of these studies is that most of them used small convenience samples obtained from a specific university. The study by Lusardi et al (2010) is an exception because it used a nationally representative sample of the United States youth population aged 12 to 17 in 1997. However, its measurement of financial literacy using the separate results of only three questions about interest rate, compound interest and risk diversification is still rather contentious.

A similar pattern was found in most studies involving adults aged 18 to 64; males were more likely have been found to have more financial knowledge than females (Worthington, 2004;

2006; Delavande et al, 2008; Hung et al, 2009; Lusardi, et al, 2010; Bumcrot et al, 2011; Caratelli and Ricci, 2011; Kharchenko, 2011; Atkinson and Messy, 2012; Fonseca et al, 2012; Hung et al, 2012; FINRA, 2013; Boisclair et al, 2014; Yu et al, 2015). Females were also more likely than men to indicate that they did not know the answers (ANZ and the Social Research Centre, 2008; Delavande et al, 2008; Hung et al, 2012; Mastercard Worldwide Insights, 2011).

Besides financial knowledge, some findings suggested that young females might have less desirable attitudes towards personal finance, as compared to young males. A study which took place in Canada found that high school female seniors were less confident than males in managing finances (Towson, 2013). Chen and Volpe (1998) examined the gender differences in personal financial literacy of American university students and found that females were less enthusiastic, confident and less willing to learn about personal finance compared to males.

There were, however some studies which found evidence that females could be more financially literate than males. In a study of the financial literacy of adults from fourteen countries, females from Hungary had significantly higher levels of financial knowledge than males (Atkinson and Messy, 2012). Another study which used a convenient sample of working class employees of Kenya Ports Authority in Kenya found that females had higher levels of financial knowledge than males (Mbarire and Abdullah, 2014). A study by Lukas et al (2014) which sampled middle-class adults from Bangkok found that there was no gender gaps in terms of financial knowledge.

For studies involving young people, there has been no conclusive pattern. In the United States in 2008, results from the National Jump$tart Coalition survey of high school and

university students showed that the mean scores of high school females were lower than that of males. However, the mean scores of female university students were higher than that of males. The mean score for high school females in the “money management” subscale was higher than that of males while for female university students, their mean scores for all five subscales (income, money management, saving, spending and credit) were higher than males.

The recent results of the OECD’s 2012 PISA study revealed that overall, there were no significant differences in financial literacy scores for both genders. However, when their abilities in mathematics and reading were controlled for, it was found that overall, boys performed better in the financial literacy test than girls.

Gender differences in financial literacy can possibly be influenced by other variables, for instance ethnicity. In the UK, women of certain ethnicities were usually less involved in financial decisions as men typically took control of the household finances, and these women were also likely to be unemployed (Financial Services Authority, 2001). Taylor (2009) presented some evidence that in the UK, differences in some aspects of financial literacy due to gender could be explained by differences in income. Lukas et al (2014) had similar findings. Another plausible explanation was that men were usually the household decision maker; hence they were more motivated to acquire more financial knowledge while women might be better at making other financial decisions which were not captured in the surveys. Fonseca et al (2012) found that although women were usually less knowledgeable about financial concepts, investment topics and insurance and this was attributed mainly to whether they were the main financial decision maker within the household. In households

where partners had similar education levels and similar financial responsibilities, the differences in financial knowledge were not significant.

To summarise, findings about females having less financial knowledge than males could be attributed to a lack of interest in the subject matter and/or traditional gender roles in household decision making. However, the recent findings of PISA 2012 have indicated that gender gaps in financial knowledge could be closing.

2.9.2 Ethnicity

Ethnicity has been regarded to be closely related to financial literacy. Cultural differences within different ethnic groups can give rise to different practices, attitudes and experiences related to managing money (United States Government Accountability Office, 2010). For example, in some cultures, having debt is viewed negatively. Understanding these differences can aid in more effective policies which take into account the needs of different ethnic groups.

In studies which examined the financial literacy of young people, differences in financial knowledge skills scores between different ethnic groups were found to be closely related to socio-economic differences such as household wealth. In a study conducted in South Africa where students from both public and private schools were surveyed, it was found that those who were “White” and studied in private schools, had significantly higher financial knowledge and skills scores compared to those who were “Asian”, “Black” or “Others” from public schools (Symanowitz, 2006). In a nationwide survey conducted in the United States, Mandell (2009a) found that high school and university students who were “White” and whose parents were wealthier and more educated, had higher financial knowledge and skills

scores than those who were “African-American”, “Hispanic American”, “Asian-American” or “Native American”.

In an American panel study which surveyed a nationally representative sample of youths aged 12 to 17, a set of financial knowledge questions was added to the 11th wave to investigate the possible predictors of youth financial knowledge (Lusardi, 2010). Three financial knowledge questions on interest rate, compound interest and risk diversification were used as measures of young people’s financial knowledge. It was found that there were significant differences due to ethnicity; Whites had significantly higher levels of financial knowledge than Blacks and Hispanics.

There is little UK research evidence about how aspects of financial literacy can be linked to ethnicity. Currently, findings from various studies suggested that differences in attitudes towards personal finance could be related to ethnic differences. In a study of young people aged 18 to 24 living in urban parts of the UK (Financial Services Authority, 2004d), it was found that young people from certain ethnic groups exhibited much more desirable attitudes than those from the other ethnic groups. Young British Asians described how they were strongly influenced by their families to save money; they often discussed personal finances openly with their families. They were financially responsible; had very strong work ethics and many wanted to become entrepreneurs. Similarly, young black Afro-Caribbeans also expressed a strong sense of responsibility towards contributing to their families’ household incomes.

In most studies involving adults aged 18 to 64, it was found that adults from ethnic minority groups had lower levels of financial knowledge (Cude et al, 2006; Boisclair et al, 2014). In the United States, African-Americans and Hispanics were less effective at managing money than

the “Whites” (Hogarth et al, 2002). They were also likely to have little knowledge about compounding of interest, inflation and portfolio diversification in shares (Bumcrot et al, 2011; Lusardi and Mitchell, 2011a; FINRA, 2013; Lusardi et al, 2014). Most Hispanics were unbanked and did not hold current accounts (Hogarth, et al, 2004). At the same time, White Americans had a significantly higher net worth than Hispanics and Blacks. These research findings suggested that differences in financial knowledge between different ethnic groups could be due to different levels of personal wealth.

In 2012, the United States carried out its first study on the financial capability of its citizens where it studied not just their financial knowledge but also other behavioural indicators which could demonstrate their capability to manage their personal finances. The behavioural indicators adopted from the UK’s 2006 baseline study on financial capability were: making ends meet, planning ahead and managing financial products. In all the behavioural and financial knowledge indicators, Blacks and Hispanics were found to be significantly less capable and knowledgeable compared to the Whites. This implied a strong link between ethnicity and financial literacy which could be moderated by wealth.

However, it is also likely that financial knowledge could be linked directly to ethnicity. A Canadian study by Boisclair et al (2014) utilised a nationally representative sample and found a significant relationship between being an ethnic minority and having lower financial knowledge. By controlling for background variables such as income, employment status and education attainment, it was found that those who declared themselves as having “visible minority status” were found to have significantly lower levels of financial knowledge.

Overall, the literature suggested that some ethnic groups were likely to have much lower levels of financial knowledge. These groups were also more likely to be poorer and even

unbanked (Hogarth et al, 2004). In the young people studies, those who were in the minority ethnic groups were likely to have lower levels of financial knowledge scores as well as to be from poorer families and/or had parents who were less educated (Mandell, 2009a).

2.9.3 Financial behaviour type

The Financial Services Authority (2004c) carried out a qualitative study on young people aged 18 to 24 and was able to identify four distinct types of individuals based on their financial behaviour: “Conservatives”, “Hedonists”, “Mixed” and “Entrepreneurs”. “Conservatives” are akin to “Savers” and they tend to be cautious with spending. They are debt averse and like to make budgets. “Hedonists” like to live for today and are akin to “Spenders”. They have a high propensity to be easily influenced to spend money. They feel comfortable with debt and rarely feel guilty about spending. Hence, they have very little or no savings. “Spenders” usually have debts. Those in the “Mixed” group exhibit behaviours of both the “Savers” and the “Spenders”. Their behaviour could possibly be influenced by both the “Savers” and “Spenders” in their daily lives. “Entrepreneurs” are independent and driven to manage their own money well. They like to seek money management advice themselves and perceive money as a way to make more money. Their use of money is highly controlled and spending tends to be related to a future benefit.

So far, there have not been any studies which examined whether these financial behaviour types could be associated with different levels of financial literacy. However, findings from various studies have indicated that there could be a possible relationship. Kempson and Atkinson (2006) identified two groups of people who could not manage their finances well. The first had very low incomes and the second were over-indebted. Both groups exhibited behaviour like those of “Spenders”. Those with very low income described themselves as

impulsive buyers and often struggled with bills and commitments. Hence, many of them did not have credit facilities or even savings. Those who were over-indebted had very heavy loan commitments and had little savings or investments. They were also spenders and liked to buy things on credit rather than saving up for them or cutting back on other expenses. These findings suggested that spenders might be less financially literate than the other behaviour types. However, there was little evidence to suggest how these financial behaviour types could be associated with the key aspects of financial literacy.

Findings from various studies suggested that "Savers" might be more financially literate than "Spenders", "Mixed" or "Entrepreneurs". Higher levels of financial literacy were found in adults who had a higher propensity to plan for retirement (Lusardi and Mitchell, 2008; FINRA, 2013; Almenberg and Säve-Söderbergh, 2011); who paid off their loans regularly (Gathergood, 2011); had non-excessive levels of debt (Gathergood, 2011) and kept an emergency fund (FINRA, 2013). Beal and Delpachitra (2003) found that young people with lower risk preferences were more likely to have higher levels of financial knowledge than those who liked to take risks.

2.9.4 Education

Various studies involving adults have found positive relationships between the levels of educational attainment (measured in various ways) and the levels of financial literacy and capability (ANZ and AC Nielsen, 2005; Kempson and Atkinson, 2006; Cude et al 2006; Bumcrot et al, 2011; Atkinson and Messy, 2012; Bucciol and Veronesi, 2013; Agnew et al, 2013; Bashir et al, 2013; Kindle, 2013; Boisclair et al, 2014; Mbarire and Abdullah, 2014). A similar relationship was also found between number of years of education and financial knowledge. Caratelli and Ricci (2011) found that in a nationally representative sample of

Italians, those who had more years of education were more likely to know how to read a bank statement, calculate changes in purchasing power due to inflation, evaluate different mortgage products and know more about pension schemes and risks in investments. The findings were unsurprising; those who were more educated would find it easier to understand basic finance concepts. Similarly, those who have had more years of education would tend to be older and had more experience in terms of managing money.

Some research findings suggested that differences in financial literacy and capability between the more educated and the less educated were related to differences in income levels associated with education attained rather than the level of education itself. Taylor (2009) conducted analyses using the British Household Panel Survey data from 1991 to 2006. Initially, it was found that those who held higher or first degrees were the most financially capable. However, when income was controlled for, the most financially capable were those with “other higher qualification” (which referred to further education beyond A Levels but not at a University level). Still, there was a significant gap found between those educated beyond A Levels and those with A Levels and below. Another study by Grohmann et al (2014b) on middle class Bangkok citizens found that having more financial knowledge as a result of having formal financial education was only present in those from better-off families. These findings implied that raising general education might not directly improve financial literacy and capability itself but possibly through an income effect.

Research studies about university students have found varying levels of financial knowledge. For young people, those who received university education had higher levels of financial knowledge compared to those who did not (Hung et al, 2009; Lusardi et al, 2010). For university students, the number of years of study matters; those who have spent more time

in university were more financially literate (Chen and Volpe, 2002; Bird, 2008). Cude et al (2008) found that students who showed more favourable financial behaviour such as paying bills on time and spending within one's credit limit, were more likely to be students with better academic results and those who have had more years of education.

Many research studies which looked at the effectiveness of financial education programs for young people have had positive findings. Young people who attended specific financial education courses were likely to become more financially literate (Tennyson and Nguyen, 2001; Davis et al, 2006; Walstad et al, 2010). In recent years, some studies have used experimental methods to examine the impact of financial education. Results suggested that financial education was a strong determinant of financial literacy. Borden et al (2007) found that university students who attended a financial education seminar had an increase in financial knowledge and desirable attitudes after the seminar. Woolsey (2011) found that a financial education course for university students improved their financial knowledge significantly, compared to those who did not attend. In a large-scale randomized controlled trial carried out in Brazil, it was found that high school students who participated in a comprehensive financial education program not only had a significant improvement in financial knowledge, they were more likely to participate in household financial decisions, saved more and helped to improve their parents' financial literacy (Bruhn et al, 2013).

It also seemed that the educational environment and subjects might have a relationship with young people's financial literacy and capability. Those who did business studies subjects in schools would tend to have more financial knowledge (Chen and Volpe, 1998; Beal and Delpachitra, 2002; Bird, 2008; Fatoki, 2014). On the contrary, law students had the lowest levels of financial knowledge (Bird, 2008). Those who had teachers who were interested in

financial education were likely to be more financially knowledgeable than those who were not (Lusardi et al, 2010). Those who attended high school with mandatory financial education provision tended to accumulate more assets and had a higher net worth in their adulthood (Bernheim et al, 2001). Obviously, since many topics in personal finance overlap with financial concepts in business studies and economics courses, it is to be expected that business, economics and even accounting students are more familiar with financial jargon and should have more financial knowledge than those who are not.

However, financial knowledge is only one aspect of financial literacy and capability; there is a lack of research evidence to suggest that business students make better money managers. A comprehensive study by Cameron et al (2014) on a group of high school students in New Zealand suggested that business studies students might have more financial knowledge and understanding than non-business studies students. However, in terms of applying financial knowledge and skills, they might not be as adept. The students were tested on five personal finance topics where questions were set as knowledge, comprehension or application type of questions according to Bloom's Taxonomy. It was found that economics and business students did better on knowledge and comprehension type of questions, but not on application type of questions. The findings suggested that a gap in financial literacy might exist between business and non-business students.

In the UK, a longitudinal study by Davis et al (2006) showed that students who took a standalone personal financial management course made improvements in terms of their financial behaviour, perceived financial self-efficacy and future aspirations.

2.9.5 Literacy and numeracy

Literacy has been regarded to be a key determinant of financial literacy (National Association of Citizens Advice Bureaux, 2001; United States Government Accountability Office, 2010; Murray, 2011). Some basic knowledge of reading and numeracy is necessary to develop proficiency in financial literacy (OECD, 2014). Murray (2011) argued that key skills needed to become financially literate often fall under the umbrella of literacy and numeracy, such as prose literacy skill, document literacy, problem solving and oral fluency. Thus, it is essential that people achieve the right levels of literacy and numeracy before receiving more financial education. While reading and writing are essential to understanding financial documents and communicating to others about them, one's numeracy has a direct relationship on one's ability to carry out various financial mathematics calculations required in different financial transactions. Other mathematical related proficiencies such as number sense, mental calculation, estimation and the ability to assess the reasonableness of numerical figures are closely related to financial literacy (OECD, 2012).

The UK's National Association of Citizens Advice Bureaux (2001) presented anecdotal evidence from caseworkers about the detriment experienced by consumers with poor literacy and numeracy skills. This was particularly evident in cases where consumers had disabilities such as reading difficulties. Such consumers often find it extremely difficult to identify suitable financial services and products. They often become victims of abusive practices from unscrupulous finance service companies. They also faced challenges in identifying welfare benefits which affected their livelihood. The United States Government Accountability Office (2010) also presented qualitative evidence that showed how a lack of proficiency in English could create significant barriers to manage everyday financial matters.

Some studies involving adults found that financial knowledge was positively correlated with literacy and numeracy (Banks and Oldfield, 2007; Mandell, 2009a; Lusardi et al, 2010). Christelis et al (2010) found that in individuals aged 50 and over, their propensity to invest in stocks was positively correlated with cognitive abilities such as numeracy, verbal fluency and recall skills. Gerardi et al (2010) investigated whether borrowers' numeracy might have been linked to the defaults and foreclosures in the United States subprime mortgage market. It was found that there was a strong and negative relationship between numeracy and various measures of mortgage delinquency and defaults. Given that other socio-demographic variables, cognitive ability and characteristics of the mortgage contracts were controlled for, the findings implied strongly that lack of numeracy skills contributed to the subprime mortgage crisis.

However, numeracy did not always have a positive relationship with all aspects of financial literacy. Based on data from the Health and Retirement Study, which surveyed people aged 51 to 56 years old, it was found that there was little association between numeracy and knowledge of pensions and social security (Gustman et al, 2010). This indicated that there could be other confounding variables which could affect the relationship between numeracy and financial literacy. For instance, Smith et al (2010) found that numeracy was a determinant of financial literacy only for those who take on the role of the financial decision maker in the family.

The research findings for young people indicated a close relationship between literacy, numeracy and aspects of financial literacy. The 2012 OECD PISA financial literacy results showed that both reading and numeracy were found to correlate positively with financial literacy for most countries. Furthermore, when reading and numeracy levels were controlled

for, it was found that students from countries with more developed financial education frameworks outperformed students from countries where the financial education frameworks in schools were less developed. In a study of New Zealand high school students, it was found that lower levels of financial knowledge were associated with lower family income, lower levels of English ability and lower levels of numeracy (Cameron et al, 2014).

2.9.6 Family

Various studies have drawn links between financial literacy and family related variables. The family is a crucial aspect of young people's financial socialisation as it is an informal source of financial education. The degree to which parents had undergone economic socialisation can have an impact on the future financial orientation of children. Webley and Nyhus (2006) found that parents' future orientation and conscientiousness were correlated with their children's. Grohmann et al (2014b) found that early childhood experiences, such as family background, parental teaching, formal school education and experiences with money were more strongly associated with financial literacy than the other types of variables. Shim et al (2010) also found that the financial literacy of young people was largely shaped by their parents. Jorgensen and Savla (2010) found that perceived parental influence had a direct and significant relationship with children's financial attitudes. Much of children's economic behaviour during adolescence and later in adulthood was found to be correlated with parents' efforts in discussing financial matters with them (Webley and Nyhus, 2006).

Young people from families with higher income were likely to be more financially knowledgeable than those from families with lower income (Chen and Volpe, 1998; Symanowitz, 2006; Mandell, 2009a; Lusardi et al, 2010; Sabri et al, 2010; Cameron et al, 2014; Grohmann, 2014b). They also tended to be more familiar with financial products and

institutions. However, young people from poorer families tended to be more skilful in terms of budgeting, bill paying, making price comparisons and stretching financial resources. They were also more knowledgeable about debts, debtors and social benefits (Financial Services Authority, 2000a).

Many studies have also shown that the financial literacy of young people was significantly correlated to the level of their parents' education (Mandell, 2009a; Lusardi et al, 2010; Grohmann, 2014b). Cude et al (2006) found that married parents contributed significantly to their children's financial literacy. CentiQ (2008) found that less financially literate parents tended to have children who were "Spenders" while more financially literate parents tended to have children who were "Savers". A study conducted on a group of university students found that parental influence had a significant influence on financial attitudes but not financial knowledge (Jorgensen and Savla, 2010).

Those who received financial education from their parents at home were likely to be more financially literate (Symanowitz, 2006). Lusardi et al (2010) found that young people had a better understanding of risk diversification if their parents had financial investments. By the time children started going to schools, Moschis (1987) found that they had already established their values, beliefs, attitudes, expectations and motivations about money. Similarly, Marshall and Magruder (1960) found that when parents handled family income well, children were more likely to be better at managing money.

These research findings indicated that when examining the correlates of young people's financial literacy, it is necessary to include familial factors such as parents' education and family wealth.

2.10 Summary

Financial literacy refers to people's ability to manage their own finances. However, there are many different definitions and perspectives about what it really means. When it was initially conceptualized, there was a greater emphasis on financial knowledge. Now, many concur that financial literacy is a broad concept which encapsulates not just financial knowledge and knowing how to apply that knowledge but also to have the attitudes and confidence to make sound financial decisions.

For young people who are still in schools, it is more relevant to focus on their financial literacy because being financially literate can help them to become more financially capable. Many aspects of financial literacy such as knowledge, skills and attitudes can be taught in schools. These objectives also support the long term objectives of the national strategy for financial capability.

A review of some financial literacy surveys for young people showed that most of them used financial knowledge as a proxy for financial literacy. Although it is not theoretically possible to assess all components of financial literacy and give an overall grade for financial literacy, it is a methodological oversight to only measure financial knowledge. Attitudes towards financial matters should also be measured and these could also be taken into consideration when trying to gain a more holistic understanding of young people's financial literacy.

There are many factors which are linked to financial literacy. Understanding the correlates of financial literacy can help to support intervention efforts and policy making which can improve young people's financial literacy. The correlates which would be investigated include: personal characteristics; educational and family related variables. The design of the research instrument will be discussed in the next chapter.

Chapter Three: Instrument design

This chapter begins with a theoretical framework that guided the design of the research instrument. It then describes how the three sections in the instrument came about. The first section is a personal finance test that assesses financial knowledge and skills objectively. The second section is a self-assessment of financial attitudes. The third section consists of questions to collect background information about the respondents.

3.1 A model of financial literacy for young people

In this study, the financial literacy of fifteen-year-olds has been defined as having the knowledge of basic financial concepts; being able to apply this knowledge in order to make sound financial decisions, and having what is generally thought of to be desirable attitudes (henceforth I shall describe them as "desired attitudes") to manage one's personal finances. Figure 3 shows the model of financial literacy which guided this research.

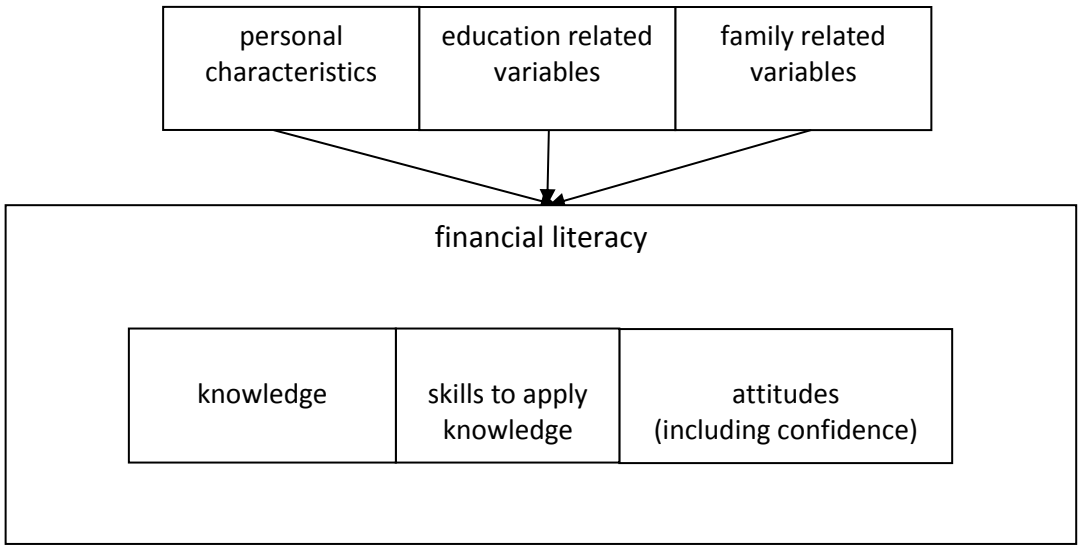


Figure 3 A model of financial literacy for children

This model is consistent with the broad definition of financial literacy which perceives financial literacy to be a combination of knowledge, skills (to apply the knowledge), and attitudes (including confidence) that will bring about making better financial decisions. Each dimension of financial literacy could be associated with other variables such as personal characteristics, educational variables and family related variables. At this point, little is known about the significance and strengths of these possible correlates.

3.2 Personal finance test

The first section of the instrument is a personal finance test which measures financial knowledge and skills using an objective approach. There has been much scepticism about the use of self-assessed financial knowledge as a proxy for actual financial knowledge (Alba and Hutchinson, 2000; Agnew and Szykman, 2005; Hung et al, 2009). Hence, the objective method was chosen to eliminate subjectivity, which can be a threat to the validity of the results (Downing, 2006).The test consists of items that require mainly financial knowledge and/or the skills needed to apply financial knowledge.

As shown in the previous chapter, the testing approach has been used frequently in other financial literacy surveys for young people, such as the Jumpstart Survey (Mandell, 2009a) and the 2012 OECD PISA module of financial literacy (OECD, 2012). Such performance tests can assess the maximum ability in an individual by using questions with pre-defined correct answers (Reynolds et al, 2008). Aptitude tests and academic achievement tests are common examples of such tests (Schultz and Whitney, 2005).

Multiple choice questions were used because they were the most common type found in financial literacy surveys for young people. Multiple choice questions can be easily scored and are effective in measuring different levels of cognitive abilities (Downing, 2006).

The development of these test questions were based on the principles of test construction described by Allen and Yen (2001), Fishman and Galguera (2003), Downing (2006), Creswell (2008).

3.2.1 The content domains of the personal finance test

The contents of the personal finance test represent a sample of all the possible types of financial knowledge and skills that a fifteen-year-old should be equipped with in order to manage their personal finances effectively. This can be separated into content domains which represent groups of important concepts in personal finance. Defining the content domains was the first stage of test construction and its clarity and rationale would determine the construct validity of the test. Construct validity refers to "the extent which the assessment adequately reflect the "important concepts, attributes, qualities or traits within the curriculum, programme of study or syllabus" (Isaacs et al, 2013).

The content domains used in the 2012 OECD PISA financial literacy assessment were adopted for the personal finance test. The OECD is an international authority on the topic of financial literacy and education. They gathered a group of experts who put together a framework for assessing fifteen-year-olds' financial literacy. Some notable experts included: Annamaria Lusardi (Dartmouth College and the George Washington University School of Business, USA), Sue Lewis (Her Majesty's Treasury, UK) and Diana Crossan (Retirement Commission, New Zealand). The framework described the content domains which were most relevant to young people and was constructed based on a review of the existing financial education frameworks from both developing and developed countries. Apart from cultural differences, there were similar topics which could be grouped into four content domains. These were: "Money and transactions" (MT); "Planning and managing finances (PMF)";

"Financial risk and rewards" (FRR) and "Financial landscape" (FL). In the previous chapter, a review of the topics tested in financial literacy surveys for young people showed that the MT, PMF and FRR domains were most frequently tested. In particular, there was a much stronger emphasis on the MT and PMF domains for young people compared to the FRR domain. Most experts felt that young people should at least be competent in the MT and PMF domains before improving their knowledge and skills in the FRR domain.

The first domain, MT, consisted of topics such as knowledge about common methods of payment, understanding the nature of financial transactions involving credit cards, dealing with conversion transactions of foreign currencies, making calculations to decide which purchase involves the best value for money and so on. Questions in this domain assess mainly knowledge and understanding of financial products and transactions, such as knowing what an overdraft is and understanding the nature of a credit card transaction. The skills which could be assessed included being able to convert between different currencies based on given exchange rates, or being able to use appropriate strategies to determine the unit prices of products.

The second domain, PMF, included questions to assess knowledge about the different ways in which income can be earned and measured; the knowledge of taxes, deductions and benefits; the ability to understand and adjust a budget; the ability to plan ahead for a future expense; the understanding about the compounding effects of interest on savings and loans, and so on.

Questions in the third domain, FRR, assess mainly knowledge about managing financial risk and rewards in the context of investments and insurance.

3.2.2 Test domains and objectives

Next, a list of test objectives for each domain was constructed, based on the OECD's framework (OECD, 2012) as well as three other sets of UK government agency guidelines and recommendations for financial education up to Key Stage 4 or around the age of sixteen (Great Britain, Department for Education and Employment, 2000; Great Britain, Department for Children and Families, 2008; Ofsted, 2008). Guidelines endorsed by each agency were indicated by "ticks" in Tables 4, 5 and 6.

Table 4 Test objectives: Money and transactions

Domain: Money and Transactions	Subject Matter Authorities			
Specific testing objectives	(OECD, 2012)	(GB, DCSF, 2008)	(GB, DFEE, 2000)	(Ofsted, 2008)
Show an understanding that money is used as a medium for exchange of goods and services.	✓	✓	✓	
Know about some major types of currencies.	✓	✓	✓	✓
Know about using overdrafts.	✓	✓	✓	✓
Know that interest is payment for use of funds.		✓	✓	✓
Understand the nature of a transaction involving a credit card.	✓	✓	✓	✓
Can work out the correct change for a cash purchase.		✓	✓	
Understand the importance of keeping financial records.			✓	
Able to convert between different currencies given the exchange rates.	✓	✓	✓	✓
Able to understand entries in a bank statement.	✓	✓	✓	✓
Able to calculate prices of possible purchases.	✓	✓	✓	✓
Able to calculate interest rates.	✓	✓	✓	✓
Able to use different ways of recording spending and savings.		✓		
Understand how bank charges are likely to be incurred.	✓	✓	✓	✓
Know the advantages of having bank accounts for financial transactions.		✓	✓	✓
Know how to choose between different types of bank accounts.		✓		
Have a basic understanding of the use of ATM cards.	✓	✓	✓	✓
Able to calculate the unit prices of products (or use other strategies) to compare prices.	✓	✓	✓	✓
Know about various methods of payment.	✓	✓	✓	✓
Able to calculate interest earned given the	✓	✓	✓	✓

beginning balance and annual interest rate.				
Able to calculate the total amount payable in a purchase transaction.	✓	✓	✓	✓
Able to understand the terms and conditions of a financial contract.	✓	✓	✓	✓

Table 5 Test objectives: Planning and managing finances

Domain: Planning and managing finances	Subject Matter Authorities			
Specific testing objectives	(OECD, 2012)	(GB, DCSF, 2008)	(GB, DFEE, 2000)	(Ofsted, 2008)
Understand that income earned may be fixed or variable depending on the terms of employment.	✓	✓	✓	✓
Able to calculate income earned.	✓	✓	✓	✓
Understand the difference between qualifications and earnings		✓		
Understand what National Insurance is.		✓	✓	✓
Understand how finance charges vary.	✓	✓	✓	✓
Know about the allowances and benefits available to young people.		✓	✓	✓
Able to understand parts of a payslip.	✓	✓	✓	✓
Understand deductions made from one's salary.	✓	✓	✓	✓
Able to make sound decisions to balance a budget.	✓	✓	✓	✓
Able to make sound choices that are likely to increase one's savings.	✓	✓	✓	✓
Know the main advantage of saving money in ISAs.	✓	✓	✓	✓
Able to examine one's budget to plan for a future expense.		✓	✓	✓
Able to understand the impact of compound interest on savings in bank accounts.	✓	✓	✓	✓
Able to understand the impact of compound interest on debts like those held on credit cards.	✓	✓	✓	✓
Understand the role of a credit counselling agency.	✓	✓	✓	✓
Know what taxes are used for.	✓	✓	✓	✓
Understand the purpose of council taxes.	✓	✓	✓	✓
Recognise the benefit of planning ahead for retirement or unexpected expenditures.		✓	✓	✓
Understand that expenditures are sometimes necessary to bring in future benefit.	✓	✓	✓	✓

Table 6 Test objectives: Financial risk and rewards

Domain: Financial risk and rewards	Subject Matter Authorities			
Specific testing objectives	(OECD, 2012)	(GB, DCSF, 2008)	(GB, DFEE, 2000)	(Ofsted, 2008)
Know the basic relationship between potential risk and reward in the context of making financial investments.	✓	✓	✓	✓
Know about the potential risks or rewards associated with various forms of credit arrangements.		✓		✓
Know what inflation is.	✓	✓	✓	✓
Understand the purpose of buying insurance.		✓	✓	✓
Know what insurance is and when to take out insurance		✓		✓
Understand the term “excess” used in insurance policies.	✓	✓	✓	✓
Know about the risks involved in gambling.		✓		
Understand what a shareholder is entitled to as a result of making a financial investment.	✓	✓	✓	✓
Know about the possible returns from holding shares in a listed company.	✓	✓	✓	✓
Know the difference between a secured loan and an unsecured loan/		✓		✓
Know how interest rates vary according to the level of risk and length of commitment.		✓		✓
Know about the relative risks of basic financial products such as foreign currencies, shares, bonds and savings products.	✓	✓	✓	✓
Understand that actions which increase risk are likely to increase the insurance policy premiums one has to pay.	✓	✓	✓	✓

In 2000, the Department for Education and Employment (DFEE) published a guidance document for head teachers, teachers and school governors to help schools understand how financial capability would fit into the 1999 PSHE/Citizenship framework for key stages 1 and 2 (Great Britain, Department for Education and Employment, 2000). This document was developed by the DFEE in consultation with the Healthy Schools Project and the personal social health and economic education (PSHE) association. It was meant to help primary school teachers understand what financial capability is and guide them in their classroom teaching. It also included a framework which listed topics, learning objectives and a model of

progression for students' learning in the primary years. The framework was linked to other subjects such as mathematics, information and communications technology (ICT) and citizenship. It was a useful resource for schools to audit their teaching with regards to financial capability as well as "provide guidance for assessing children's progress in developing financial capability" (Great Britain, Department for Education and Employment, 2000:4).

This document was listed as a relevant resource for teachers by the PSHE association and a learning website called "Values, Money and Me" which was developed by Experian, a public company. The website has been promoted as a recommended teaching resource by PFEG and has received the PFEG quality mark. This meant that the resource was accurate, engaging, relevant and of high educational value for use in financial education. Also, the Quality Mark has been endorsed by the Department for Education (DFE), The Money Advice Service, Education Scotland and the All-Party Parliament Group (APPG) on financial education for young people.

The Department for Children, Schools and Families (DCSF) was a department of the UK government from 2007 to 2010. It published a guidance document to advise secondary schools on financial capability education for Key Stages 3 and 4 (Great Britain, Department for Children and Families, 2008). It looked at the programmes of study for citizenship, mathematics and the economic wellbeing and financial capability programme of study under PSHE as the key delivery subjects for financial capability. Based on these programmes of study, the document presented suggestions, guide questions and assessment to help schools plan and develop coherent programmes of financial education. It also linked financial education with other subjects such as English, Science and Religious Education so that

teachers can use various contexts for financial education. There were also useful suggested teaching approaches, assessment methods and resources that schools might find useful. This document has been endorsed by the PSHE association as a relevant authority on topics relevant to secondary school students.

The Office for Standards in Education, Children's Services and Skills (Ofsted) is a department of the UK government which inspects and regulate services which involve children and young people, such as schools and other educational establishments. They are an authority on the standards of provision in schools and as such their views about the provision of financial education in secondary schools were also considered. In 2008, Ofsted published a report on good practices found in schools and colleges which served as another guidance document and authority on the "gold standards" of financial education in the UK. This document described the types of knowledge, skills and attitudes which should be included in any financial education curriculum for children and young people.

Keeping the test domains close to the recommended standards proposed by the subject matter authorities contributed to the content validity evidence of the test, which according to Isaacs et al (2013), refers to "the extent to which the assessment has extensively covered the pertinent topics in a curriculum, programme of study or syllabus.

3.2.3 Test specifications

The next step was to construct a table of test specifications. This is also known as the test blueprint, which "defines and precisely outlines the number (or proportion) of test questions to be allocated to each major and minor content area and how many (what proportion) of these questions will be designed to assess specific cognitive knowledge levels" (Downing, 2006:9).

Table 7 shows the table of specifications for the personal finance test in the pilot survey. All the questions would be in the multiple choice question format. Some questions require only knowledge while others require an application of knowledge to get the right answer. According to the OECD, Bloom's Taxonomy cannot be wholly applied in the assessment of financial literacy. The cognitive processes in the financial literacy construct are all equally essential as part of an individual's financial literacy and these processes should not be operationalised as a hierarchy of skills (OECD, 2012).

As shown in Table 7, more questions were allocated to the MT and PMF domains, compared to the FRR domain. According to two reviews of financial education in UK schools carried out previously (Financial Services Authority, 2002; Financial Services Authority, 2006e), the majority of topics in personal finance taught to secondary school students were found within these two domains. Examples included: budgets, credit, earnings, benefits and taxation. Topics related to FRR, such as investment and insurance, were rarely taught to students. In the most recent review conducted by the APPG on financial education for young people, many teachers felt that the core content of financial education in secondary schools should focus on budgeting, borrowings, interest rates and making financial decisions, which fall under the MT and PMF domains of the test (All-Party Parliament Group on Financial Education for Young People, 2011).

Table 7 Table of specifications

Content Domains	Recall (Knowledge)	Application (Knowledge+Skills)	Totals (%)
Money and transactions	6	6	12 (40%)
Planning and managing finances	6	6	12 (40%)
Financial risk and rewards	4	2	6 (20%)
Totals (%)	16 (53%)	14 (47%)	30 (100%)

3.2.4 Item development

Based on Tables 4, 5 and 6, a selection of testing objectives was made. In an attempt to be as conservative as possible in ensuring the validity of the test, items were only developed for the learning objectives which were recognised by all four subject matter authorities. Tables 8, 9 and 10 list the specific testing objectives and their allocated test item code. The item bank can be found in Appendix F.

Table 8 Specific testing objectives: Money and transactions

Test Item code	Specific testing objectives
MT1	Know about some major types of currencies.
MT2	Know about using overdrafts.
MT3	Know that interest is payment for use of funds.
MT4	Understand the nature of a transaction involving a credit card.
MT5	Able to convert between different currencies given the exchange rates.
MT6	Able to understand entries in a bank statement.
MT7	Able to calculate prices of possible purchases.
MT8	Able to calculate interest rates.
MT9	Understand how bank charges are likely to be incurred.
MT10	Know the advantages of having bank accounts for financial transactions.
MT11	Have a basic understanding of the use of ATM cards.
MT12	Able to calculate the unit prices of products (or use other strategies) to compare prices.
MT13	Know about various methods of payment.
MT14	Able to calculate interest earned given the beginning balance and annual interest rate.
MT15	Able to calculate the total amount payable in a purchase transaction.
MT16	Able to understand the terms and conditions of a financial contract.

Table 9 Specific testing objectives: Planning and managing finances

Test Item code	Specific testing objectives
PMF1	Understand that income earned may be fixed or variable depending on the terms of employment.
PMF2	Able to calculate income earned.
PMF3A PMF3B	Understand what National Insurance is.
PMF4	Understand how finance charges vary.
PMF5	Able to understand parts of a payslip.
PMF6	Understand deductions made from one's salary.
PMF7	Able to make sound decisions to balance a budget.
PMF8	Able to make sound choices that are likely to increase one's savings.
PMF9	Know the main advantage of saving money in ISAs.
PMF10	Able to examine one's budget to plan for a future expense.
PMF11	Able to understand the impact of compound interest on savings in bank accounts.
PMF12	Able to understand the impact of compound interest on debts like those held on credit cards.
PMF13	Understand the role of a credit counselling agency.
PMF14	Know what taxes are used for.
PMF15	Understand the purpose of council taxes.
PMF16	Understand that expenditures are sometimes necessary to bring in future benefit.

Table 10 Specific testing objectives: Financial risk and rewards

Test Item code	Specific testing objectives
FRR1	Know the basic relationship between potential risk and rewards in the context of making financial investments.
FRR2	Know what inflation is.
FRR3A FRR3B	Understand the purpose of buying insurance.
FRR4	Understand the term "excess" used in insurance policies.
FRR5	Understand what a shareholder is entitled to as a result of making a financial investment.
FRR6	Know about the possible returns from holding shares in a listed company.
FRR7	Know about the relative risks of basic financial products such as foreign currencies, shares, bonds and savings products.
FRR8	Understand that actions which increase risk are likely to increase the insurance policy premiums one has to pay.

Designing effective test questions which can measure the relevant content at an appropriate cognitive level has been thought of to be one of the challenges of item writing (Downing, 2006). There is also an artistic element (Cantor, 1987) as well as a scientific process (Downing, 2006; Assessment Systems Corporation, 2011) when it comes to designing test

items. There are certain traits of item writers which as a whole, contribute to the validity evidence of the test (Downing, 2006; Assessment Systems Corporation, 2011).

The most important trait for an item writer is one who has content expertise (Downing, 2006; Assessment Systems Corporation, 2011). However, subject matter expertise does not always lead to effective item writing (Downing, 2006). My experience as a test item writer stemmed from five years of being a school teacher as well as having spent a year studying various financial education curricula and examining the various financial education teaching resources targeted for children in Key Stages 1 to 4.

According to Cantor (1987), item writers should also be knowledgeable about their test-takers. During the course of this research, I taught primary and secondary school students at an after-school tuition centre based in Oxford. I have also attended numerous financial education seminars and learnt about how financial education is provided for young people in the UK.

Item writers need to be trained in order to produce high quality test questions (Downing, 2006). To ensure solid item writing skills, one needs to receive training, practice writing items and receive feedback on items (Jozefowicz et al, 2002). I am a qualified teacher who is experienced in test production and I have studied about the principles of item writing, editing and assembly which I shall discuss shortly.

There are several components in a multiple-choice item: a stem; a lead line and response options. A stem refers to a problem, a case or a scenario. A lead line refers to the question or task. Response options include the correct answer (key), incorrect options (foils/distractors).

There are many item-writing guidelines for writing multiple-choice type questions in different textbooks. These guidelines vary and have been criticised by many (Cronbach, 1970; Haladyna, 1999; Nitko, 1985; Roid and Haladyna, 1982) that these were based mainly on personal experience, wisdom and lacked scientific validation. In an attempt to produce a validated list of item-writing guidelines for classroom assessment, Haladyna, Downing and Rodriguez (2002) proposed a list of 31 guidelines which were reviewed by textbook authors. Research evidence pertaining to these guidelines was also gathered. The items for the personal finance test were thus written in tandem with these guidelines as listed in Table 11.

Table 11 A validated taxonomy of multiple-choice item writing guidelines (Haladyna, Downing and Rodriguez, 2002)

No.	Guideline
1	Each item should reflect and measure a single specific content as indicated in the test specifications.
2	Each item is based on important learning content and not trivial content.
3	Novel material should be used.
4	The content of each item should be independent from content of other items on the test.
5	Overly specific and overly general content should be avoided.
6	Opinion-based items should be avoided.
7	Trick (“red-herring”) items should be avoided.
8	Simple and suitable vocabulary should be used.
9	Items should be in a vertical format.
10	Items should have been edited and proof-read.
11	Correct grammar should be used.

12	The amount of reading in each item should be minimized.
13	The directions in the item stem should be very clear.
14	The central idea should be included in the stem instead of the choices.
15	“Window dressing” or excessive verbiage should be avoided in the stem.
16	Ensure that only one of the choices is the correct answer.
17	The location of the correct answer should be varied.
18	The choices have been arranged in a logical or numerical order.
19	The choices should be independent and not overlap.
20	The choices should be homogenous in content and grammatical structure.
21	The length of the choices should be kept about the same.
22	The choice “None of the above” should be used carefully.
23	The choice “All of the above” should be avoided if possible.
24	Choices should be phrased positively and “NOT” in the choices should be avoided.
25	Clues to the right answer should be avoided.
26	Distractors have been made plausible.
27	Common errors of students are used to write the distractors.

The items were edited after being written. The stringent editing process also contributed to the validity of the test by improving the appearance, readability, accuracy and clarity of the questions (Baranowski, 2006). It was also necessary to allow adequate time for editing and revising the items (Haladyna et al, 2002). A sensitivity review was also carried out to eliminate any cultural, ethnic, religious and gender biases as it was possible for a specific characteristic of an item to result in differential performance for individuals of the same

ability. Items were also checked to ensure that they did not contain offensive, demeaning and emotionally charged material (Hambleton and Rogers, 1995) as well as to ensure that an appropriate balance of multicultural terms and gender representation was achieved (Educational Testing Service, 2009).

After the editing stage, the items were assembled into a preliminary test format and checked against the test content specifications (Downing, 2006). The layout of the test items was formatted to achieve the highest ease of readability. The readability statistics for all the test versions were checked (Table 12) to ensure that test takers who were less proficient in the language medium used would not perform below their actual level of competency in the construct measured (Abedi, 2006).

Table 12 Readability Statistics

	Test Version for independent reviewers	Pilot test version	Final test version
Flesch Reading Ease (Between 0 to 100%); the higher the easier to read.	65.8	69.6	71.2
Flesch-Kincaid Grade Level (For fifteen-year-olds, 7th to 8th Grades)	7.3	7.1	6.7

3.2.5 Content validation by subject matter experts

Independent content reviews conducted after professional editorial reviews also contributed to the content validity of the test (Downing, 2006; Kane, 2006; Assessment Systems Corporation, 2011). Content validity is concerned with "the degree to which a sample of items, taken together, constitute an adequate operational definition of a construct" (Polit

and Beck, 2006). In this process, the subject matter experts had to make sure that three assumptions were met (Wynd, Schmidt and Schaefer, 2003; Polit and Beck, 2004; Waltz, Strickland and Lenz, 2005; Kane, 2006:150): appropriateness and clarity of each domain; representativeness of the sample of objectives chosen and the appropriateness of the scoring rule and procedures. Baranowski (2006) recommended that the reviewers should confirm that each item corresponds with the appropriate testing objective listed in the specifications. It would also be useful to inform the reviewers about the item writing guidelines that had been adhered to (Baranowski, 2006).

There is no universal format for content validation. Based on the principles above, four checklists were drawn up to record the results of the review for each of the subject matter experts (Tables 13, 14, 15 and 16).

Table 13 Independent reviewer checklist 1

Name of reviewer:	
Validation points: The overall FKS test plan	Tick for “yes, Cross for “no”
Are the domains (MT, PMF, FRR) adequate for measuring financial knowledge and skills of 15-year-olds in England?	
Based on the table of specifications and list of testing objectives for each domain, are you satisfied that the objectives chosen are representative of each domain?	
Are you satisfied with the scoring procedures? (0 marks for incorrect/omitted answers; 1 mark for correct answer)	

Table 14 Independent reviewer checklist 2

Name of reviewer:			
Domain: Money and Transactions			
Item code	Testing objective	Is the item valid in relation to the testing objective? (Tick for “yes, Cross for “no”)	Violation of item-writing guidelines (if any, please state which guideline)
MT1	Know about some major types of currencies.		
MT2	Know about using overdrafts.		
MT3	Know that interest is payment for use of funds.		
MT4	Understand the nature of a transaction involving a credit card.		
MT5	Able to convert between different currencies given the exchange rates.		
MT6	Able to understand entries in a bank statement.		
MT7	Able to calculate prices of possible purchases.		
MT8	Able to calculate interest rates.		
MT9	Understand how bank charges are likely to be incurred.		
MT10	Know the advantages of having bank accounts for financial transactions.		

MT11	Have a basic understanding of the use of ATM cards.		
MT12	Able to calculate the unit prices of products (or use other strategies) to compare prices.		
MT13	Know about various methods of payment.		
MT14	Able to calculate interest earned given the beginning balance and annual interest rate.		
MT15	Able to calculate the total amount payable in a purchase transaction.		
MT16	Able to understand the terms and conditions of a financial contract.		

Table 15 Independent reviewer checklist 3

Name of reviewer:			
Domain: Planning and managing finances			
Item code	Testing objective	Is the item valid in relation to the testing objective? (Tick for "yes, Cross for "no")	Violation of item-writing guidelines (if any, please state which guideline)
PMF1	Understand that income earned may be fixed or variable depending on the terms of employment.		
PMF2	Able to calculate income earned.		
PMF3A PMF3B	Understand what National Insurance is.		
PMF4	Understand how finance charges vary.		
PMF5	Able to understand parts of a payslip.		
PMF6	Understand deductions made from one's salary.		
PMF7	Able to make sound decisions to balance a budget.		
PMF8	Able to make sound choices that are likely to increase one's savings.		

PMF9	Know the main advantage of saving money in ISAs.		
PMF10	Able to examine one's budget to plan for a future expense.		
PMF11	Able to understand the impact of compound interest on savings in bank accounts.		
PMF12	Able to understand the impact of compound interest on debts like those held on credit cards.		
PMF13	Understand the role of a credit counselling agency.		
PMF14	Know what taxes are used for.		
PMF15	Understand the purpose of council taxes.		
PMF16	Understand that expenditures are sometimes necessary to bring in future benefit.		

Table 16 Independent reviewer checklist 4

Name of reviewer:			
Domain: Financial risks and rewards			
Item code	Testing objective	Is the item valid in relation to the testing objective? (Tick for "yes, Cross for "no")	Violation of item-writing guidelines (if any, please state which guideline)
FRR1	Know the basic relationship between potential risk and rewards in the context of making financial investments.		
FRR2	Know what inflation is.		
FRR3A FRR3B	Understand the purpose of buying insurance.		
FRR4	Understand the term "excess" used in insurance policies.		
FRR5	Understand what a shareholder is entitled to as a result of making a financial investment.		
FRR6	Know about the possible returns from holding shares in a listed company.		
FRR7	Know about the relative risks of basic financial products such as foreign currencies, shares,		

	bonds and savings products.		
FRR8	Understand that actions which increase risk are likely to increase the insurance policy premiums one has to pay.		

There were three reviewers: Ken Mayhew, Rod McKee and Anthony Lapsley. Professor Ken Mayhew is an emeritus professor of economics. Rod McKee was the vice principal of financial capability at the ifs university college. Anthony Lapsley was the head of further education programmes at the ifs University College where he was involved in developing the curriculum, syllabi and assessments for their financial capability programmes. There were two meetings with each reviewer. At the first meeting for each reviewer, there was a presentation of the research aims and rationale, followed by a briefing of the validation process and documents. Each reviewer was provided with a hard copy of the test specifications, test objectives, test items and a list of item writing guidelines. At the second meeting, the reviewers would return the checklists and discuss the issues they would like to raise.

All the reviewers felt that the three test domains were adequate for measuring the financial knowledge of fifteen-year-olds in England. They were also satisfied that the testing objectives chosen were representative of each domain. They were also satisfied with the scoring procedures. Most of the test items were deemed acceptable by the reviewers. However, some items were flagged by the reviewers. Flagged items were either revised or marked to be unsuitable for inclusion in the pilot test. The next section shows a list of the flagged items and how they were dealt with. Based on the review results, 30 items were selected to be included in the pilot test phase. The pilot test items can be found in Appendix G.

3.2.6 Problematic test items

This section lists the problematic test items that were flagged by the reviewer(s). Any exhibits related to the test items which are not presented here can be found in Appendix G. The decision to edit or remove the item is reflected in bold under the feedback column.

Test Item Code	Question (answers in bold)	Feedback (decisions in bold)
MT1	Which symbol represents the **Euro**? A. £ **B. €** C. $ D. ¥	Too easy, Irrelevant **(REMOVE)**
MT3	What does the bank pay you for holding your savings? A. profit **B. interest** C. dividend D. premium	Easy to guess High chance of getting the correct answer if one does not know what "dividend" and "premium" are. **(REMOVE)**
MT8	You put £500 into a savings account at the beginning of the year and had £512.50 in the account at the end of the year. Calculate the annual interest rate. A. 1.0% B. 2.0% C. 1.5% D. **2.5%**	Distractors should be arranged in ascending order. **(EDIT)**

Test Item Code	Question (answers in bold)	Feedback from reviewer(s)
MT10	Which of the following statements are true about the advantages of having bank accounts? I. Bank accounts help you save money. II. Bank accounts keep your money safe. III. Bank accounts help you to pay your bills. IV. Bank accounts help you to receive your salary and benefits. A. I B. I and II C. I, II and III **D. I, II, III and IV**	Item is too easy. Easy to guess by selecting all four statements. **(REMOVE)**
MT16	Nadiah received her credit card statement and found that someone has used her card to make a purchase on an internet website. She was certain that she has been very careful about keeping her card details safe. Based on the terms and conditions of the credit card in Exhibit C, which of the following statements are **TRUE**? I. Nadiah must contact the bank immediately to report the fraudulent use of her card. II. Since it was not her fault, the bank will not make her pay for **all** the purchases she made that month. III. Even though Nadiah did not make the fraudulent transaction, she must pay for at least half of it since she is the account holder. IV. Nadiah would not have to pay for any transaction which she did not authorise. A. I B. I and II **C. I and IV** D. I, II, III and IV	Too wordy. Tests reading more than knowledge and skills. **(REMOVE)**

Test Item Code	Question (answers in bold)	Feedback from reviewer(s)
PMF3A	Which of the following statements about the UK National Insurance (NI) is/are true? I. Most people who work have to pay NI. II. Everyone pays the same amount of NI. III. If you pay NI, you normally have to pay income tax as well. IV. Paying NI helps the government to provide state benefits such as Jobseeker's allowance. A. I B. I and II **C. I, II and IV** D. I, III and IV	Should avoid testing about national policies as they might change. **(REMOVE)**
PMF3B	Esther works full-time as a shop assistant. Who pays the National Insurance contributions on Esther's wages? **A. Esther** B. Esther's employer C. The UK government D. Esther and her employer	The question is confusing and ambiguous. Esther's employer pays her NI on her behalf. **(REMOVE)**
PMF9	What is the main advantage about keeping your money in ISAs (Individual Savings Accounts)? A. You can earn a higher interest rate. **B. The interest earned on an ISA is tax-free.** C. You cannot withdraw your money for at least a year. D. You can deposit as much money as you like into an ISA.	Should avoid testing about national policies as they might change. **(REMOVE)**

Test Item Code	Question (answers in bold)	Feedback from reviewer(s)
PMF13	If you are behind on your debt payments and you go to a credit counselling service such as the Citizens Advice Bureau, how are they most likely able to help you? A. They can lend you more money to pay off your debts. B. They can cancel all your credit cards without your permission. C. They will ask the government for money to help you with your debts. **D. They will work with your debtors to set up a payment schedule that is reasonable for you to meet.**	The correct answer is obvious. Those who do not know the correct answer will tend to select the longest distractor which is the correct answer in this instance. **(REMOVE)**
PMF15	How are local services like refuse collection funded? A. Income Tax **B. Council Tax** C. National Insurance D. VAT (Value-Added Tax)	Irrelevant **(REMOVE)**
FRR3A	If each of the following persons had the same amount of take home pay, who would need the greatest amount of life insurance? A. A young married man without children. B. A young single woman without children. **C. A young single woman with two young children.** D. An elderly retired man, with a wife who is also retired.	Distractors A and B are similar. By elimination, it is easy to guess the correct answer. **(REMOVE)**

Test Item Code	Question (answers in bold)	Feedback from reviewer(s)
FRR3B	Which of the following general statements about insurance is true? I. It is a form of financial protection against a certain life event which could happen. II. Motor insurance is compulsory if you drive a vehicle. III. The insurer bears the financial risk when they agree to insure you. IV. You can get a refund on your insurance if nothing happens to you. A. I B. I and II **C. I,II and III** D. I, II, III and IV	Statement II is unclear. Questions of this format should be avoided if possible. **(REMOVE)**
FRR6	What are two main ways that an investor can get a return from keeping shares in a listed company? A. Dividends and tax credits. B. Dividends and interest from the stock. **C. Dividends and an increase in the price of the stock.** D. Tax credits and an increase in the price of the stock.	This question is too difficult and irrelevant for fifteen-year-olds. This question is biased towards business studies students. **(REMOVE)**

Test Item Code	Question (answers in bold)	Feedback from reviewer(s)
FRR8	Last year, Barry's motorbike was insured by the ANGSANA insurance company. The insurance policy covered damage to the motorbike and theft of the motorbike. Barry plans to renew his insurance with ANGSANA this year. Which of the following factors are likely to increase the cost of his motorbike insurance? I. Barry painted his motorbike. II. Barry had two road accidents last year. III. Barry bought a more secure lock for his motorbike. IV. Barry changed his motorbike's engine with a more powerful one. A) I and IV **B) II and IV** C) III and IV D) II, III and IV	Window dressing of distractor III; the distractor is too distracting. Please change to describe that the lock has been changed. **(EDIT)**

As a result of the independent reviews of the items, some items were not included in the pilot test (Items MT1, 3, 10, 16; PMF 3A, 3B, 9, 13, 15; FRR 3A, 3B, 5). Two items received minor editing (Items MT 8 and FRR 8).

The next section describes the second section of the survey which measured financial attitudes.

3.3 Self-assessment of financial attitudes

Financial literacy is more than just about knowledge. People's psychological characteristics, such as attitudes, also matter in affecting the financial decisions they make (Financial Services Consumer Panel, 2000; De Meza et al, 2008). In the past, attitudes were viewed as individual mental processes that determine a person's behaviour (Thomas and Znaniecki, 1918). In more recent times, attitudes have been regarded as psychological tendencies to respond positively or negatively to certain objects, situations, concepts or people (Eagly and Chaiken, 1993; Aiken, 2002).

However, there is not a formal definition of financial attitudes available in the field of financial literacy. It has been implied that desirable attitudes can influence one's money management behaviour (Johnson and Staten, 2010). Examples of "desired attitudes" include confidence, willingness, innate motivation, mental capacity and readiness to act on the necessary financial knowledge and skills (Moore, 2003; Financial Services Authority, 2005b; Atkinson and Messy, 2012). Financial Services Authority (2005b) described desired attitudes in financial literacy as one's willingness to invest time and resources to use financial knowledge and skills; being proactive in seeking information, advice and resources and having the confidence to make financial decisions. Atkinson and Messy (2012) argued that attitudes are important aspects of financial literacy; people who are less positive about saving for their future are less likely to save. Similarly, those who prefer to spend money by living in the moment and not planning for the future are also less likely to have emergency savings or long term financial plans. On the other hand, financially literate individuals are often inclined to control their spending, negotiate discounts, avoid debts and avoid making risky decisions (Lissington and Matthews, 2012).

Attitudes were thought to influence the outcomes of financial decisions (The Jumpstart Coalition for Personal Financial Literacy, 2007; OECD, 2012). UK government agencies have also expressed similar views, one of which was that young people needed to develop "appropriate attitudes that are reflected in taking personal responsibility for money management, questioning the claims of some financial products and evaluating available information before taking financial decisions" (Great Britain, Department for Children, Schools and Families, 2008:5) as well as explore "attitudes related to priorities, needs and wants for the near future and later in life" (Great Britain, Department for Children, Schools and Families, 2008:15). Ofsted inspectors felt that young people's attitudes towards managing money are likely to be developed before they reach the legal age of 18, hence the development of desired attitudes is critical to help them make sensible financial decisions. In their guidance document aimed at developing young people's financial capability (Ofsted, 2008), they described attitudes that young people should achieve by the age of 16. Some desired attitudes included for example, the inclination to use money effectively, such as comparing prices; the inclination to live within one's means; the inclination to make rational financial decisions for example, by prioritising needs and wants and the inclination to seek information for making financial decisions.

The types of desired attitudes that young people should acquire can also be inferred from assessment tools. At the time when this research was carried out, there was only one such tool available which included assessment of attitudes (Personal Finance Education Group, 2010a). In partnership with EdComs, the PSHE association and National Children's Bureau, PFEG developed an online tool for assessing financial knowledge, skills and attitudes called "FinCAP". This tool is an interactive teaching and assessment tool with close links to the PSHE education part of the National Curriculum, specifically the programme of study for

Economic Wellbeing. In particular, the assessment content reflects the types of attitudes which can be cultivated in young people. Students who take part in this assessment have to select attitude statements that reflected their attitudes. Analyses of these statements revealed that attitudes could be separated into desirable and undesirable attitudes. Some of these statements are listed in Table 17.

Table 17 Desirable and undesirable attitudes

Attitude	Desirable attitudes	Undesirable attitudes
the importance of financial literacy		"I really don't know much about money-I don't think that really makes a difference to employers"
spending		"Sometimes I spend more than I earn in a month, but I've got a flexible overdraft so it doesn't matter. Live for today, I say!" "I just want a good car as soon as I can. I don't care if I waste a bit of money-I'll just get another one if it's no good."
saving	"Saving money is great because you earn interest and it keeps growing. You've also got money there when you really need it." "I'm saving towards all sorts of stuff: a car, college, a new laptop……so I don't do much spending now."	"I know I should be saving for college and the future, but I get so little money that I don't see the point."
being financially independent		"I don't think work is that important-you can always get benefit money from the government if you're out of a job"

debt	"You hear about people getting into massive debt, owing thousands and it's scary. The banks can repossess your stuff if you can't make payments." "I'm trying to manage without a loan. Loans mean debt and that means paying back more than you borrow, because of the interest." "I am a bit worried about getting into debt. Owing money means you're always trying to pay it back." "It's risky to get a loan to buy a bike because you have to make repayments whatever happens, as well as having the cost of fuel repairs and all that. And you have to pay back more than you borrow too-it's too much debt."	"Instead of saving for a bike, I'd get a loan: you could get the wheels tomorrow and then pay off the loan instead of saving. Voila" "Borrowing money is the only way to get big things like cars: it takes too long to save. Anyway, it's easy to pay back a few quid a week" "Borrowing money is OK. I owe my sister £25, my mum £140 and I'm going to get a bank loan as soon as I can."
plan ahead	"I look at web reviews to choose a mobile, and I compare prices and deals in as many different places as possible." "I think good value is the most important thing when buying something big. You need to do your research, compare lots of different cars and ask questions, I reckon"	"I spend money as soon as I get it-it's there to enjoy"; "Mobiles? I want the coolest one I can get. I look at ads to see the latest handsets"

Overall, the literature indicated that there were desired attitudes which young people could acquire through general or financial education. However, these attitudes cover a variety of

personal finance topics. It would be narrow-minded to focus the measurement of attitudes on only one aspect such as attitudes towards spending. As such, it was decided to measure attitudes across a variety of personal finance topics. The basis for selecting these topics was determined by what has been emphasised in the literature, which were the views of central and particularly influential policy makers in the UK and international institutions. Table 18 presents the attitudes measured and their corresponding statement.

Table 18 Objectives of attitude statements

Attitude	Statement
The inclination to want to be financially literate	Knowing how to manage money is important to me.
The inclination to spend money	Money is there to be spent.
The inclination to save money	I should start saving money only when I have a paying job.
The inclination to be financially independent	I would rather earn my own money than to ask my parents for money.
The inclination to be financially indebted to others	I am comfortable about owing someone money.
The inclination to seek information related to financial decisions	I like to compare prices.
One's confidence in managing money	I am confident of managing my own money.

The attitude statements in Table 18 were constructed by taking into consideration guidelines described in Likert (1932). I followed three relevant criteria for the framing of the attitude statements. Firstly, all the statements should express desired behaviour rather than fact. Secondly, the statements should be clear and concise, using the shortest sentences and simplest vocabulary available. Thirdly, approximately half of the statements should be positively phrased and the rest negatively phrased. This was to avoid the tendency for

respondents to give stereotyped responses. Hence, there were three negatively phrased statements and four positively phrased statements which were distributed randomly in section two of the survey. Each statement could be rated on a standard five-point Likert scale.

Since the whole instrument has to be completed by fifteen-year-olds within one hour, only seven attitude statements were set. It was not the aim of this research to create an attitude scale but to gain a preliminary understanding of young people's attitudes towards various aspects of personal finance. This would help to give an indication of where attitudes might be more or less desirable.

For each statement, participants were required to rate the degree to which they agreed or disagreed with it. The choices were as follows: "Strongly agree"; "Agree"; "Neither agree nor disagree"; "Disagree"; "Strongly disagree". In Table 18, the first, fourth, sixth and seventh statements are positively phrased while the other statements are negatively phrased. Participants received a higher score if they agreed more with positively phrased statements. Conversely, they received a lower score if they agreed more with negatively phrased statements.

3.4 Measuring the correlates of financial literacy

Besides measuring financial knowledge, skills and attitudes, background variables about the participants were also measured. These variables were thought of to correlate with financial literacy. As shown in Table 19, these variables were grouped into personal characteristics, educational and family related variables. It also shows the choices available for each variable. The survey questions can be found in Appendix H (pilot survey) and Appendix K (final survey).

Table 19 Background variables

Type of variables	Name of Variable	Categories
Personal characteristics	Gender	Male Female
	Ethnicity	White Mixed Asian (Indian, Pakistani, Bangladeshi, Chinese) Black Other
	Financial behaviour type (Financial Services Authority, 2004c)	"Saver" (*If I have money, I prefer to save it.)* "Spender" (*If I have money, I prefer to spend it*.) "Mixed Saver/Spender" (*If I have money, I might save or spend it.*) "Entrepreneur" (*If I have money, I will use it to start a business.)*
Educational variables	Business studies student	No Yes
	Year 9 English level/grade	level 1 to 4 (Grade E and below) level 5 (Grade D) level 6 (Grade C) level 7 (Grade B) level 8 (Grade A)
	Year 9 Mathematics level/grade	level 1 to 4 (Grade E and below) level 5 (Grade D) level 6 (Grade C) level 7 (Grade B) level 8 (Grade A)
Family related variables	Receives free school meals	No Yes
	Number of books in the family	0 to 20 21 to 50 51 to 100 more than 100
	Parents' highest education	Lower than A levels A levels University education

The personal characteristics measured were: gender, ethnicity and financial behaviour type. Gender is a binary variable with two categories: male and female. Five ethnic groups were used, based on the 2011 UK census ethnic groupings: White, Mixed, Asian, Black and Others (Great Britain, Office for National Statistics, 2012). The classifications for financial behaviour

types were based on research by the FSA about young people's attitudes towards financial matters (Financial Services Authority, 2004c; 2004d). It was found that young people could belong to one of the following four groups: "Savers", "Spenders", "Mixed Saver/Spenders", and "Entrepreneurs". "Savers" are those who tend to save money and will spend money carefully. "Spenders" like to live in the present and spend their money as soon as they have it. They are positive about their future and believe that they will get a well-paying job to meet their spending needs. The "Mixed Saver/Spenders" display characteristics of both the savers and the spenders; sometimes saving a lot or spending a lot. The "Entrepreneurs" view money as a means to earn more money and they tend to accumulate money for such reasons. Unlike "Savers", they are more prepared to take risks with their money. Respondents were asked to select one of four statements (Table 19) which describes themselves best.

Educational variables included: whether one was taking business studies; one's Year 9 English and Mathematics level or grade. The respondents' English and Mathematics levels were measured by the results of their English and Mathematics National Curriculum assessment carried out at the end of Year 9 (Key Stage 3). These assessments for English, Mathematics and Science were mandatory for all Year 9 students until the end of summer in 2008 (British Broadcasting Corporation, 2008). For each subject, there were 8 attainment levels, with 1 being the lowest. At the end of year 9 or Key Stage 3, students were expected to achieve at least a level 5 or 6. Although these assessments were no longer mandatory from 2009 onwards, many schools still carried out assessments at the end of Year 9 to help teachers monitor how students were progressing within each level. Thus, it was possible for the respondents to know which level they achieved in Year 9. The attainment levels can also

be interpreted in terms of GCSE grades, ranging from A to G. For brevity, I have used Table 20 to match levels and grades. Some of the participating schools have chosen to use GCSE grades equivalent of the old National Curriculum levels. Thus, respondents could indicate their English and Mathematics achievement in terms or levels of grades. If they were unsure, they were not required to provide that information.

Table 20 Attainment levels and equivalent grades

Level	Grade
8	A and above
7	B
6	C
5	D
4 and below	E

For fifteen-year-olds, the family plays a critical role in the environment which they grow up in. In this research, I considered the relationship between family socio-economic status and parents' education with financial literacy. For family socio-economic status, two indicators were used: free school meals (FSM) and number of books in the family. FSM is a common indicator of family poverty (Hobbs and Vignoles, 2007; Strand, 2014). Students from families who receive state benefits such as income support, jobseekers' allowance or child tax credits are eligible to apply for FSM. This indicator, a familiar measure amongst users of educational research, is a direct measure of students' circumstances. However, it only provides a dichotomous measure of the lower end of economic status, and could be affected by parental or student choice (Styles, 2008). Therefore, another indicator, the number of books

in the home, was used. This information could be easily obtained from fifteen-year-olds. This indicator has been used by the OECD as one of the measures of family socio-economic status. It not only indicates the amount of literary resources at home, but is also a measure of family wealth. This variable has also been used in other international studies such as Trends in International Mathematics and Science Study (TIMSS), and the International Association for the Evaluation of Educational Achievement (IEA) Reading Literacy Study (Kirsch et al, 2002).

3.4 Summary

The first section of the research instrument was a personal finance test. The test domains were: “Money and transactions”, “Planning and managing finances” and “Financial risk and rewards”. In order to ensure that the personal finance test is a valid one, several measures were taken. Firstly, the testing objectives were closely linked to the learning objectives of financial education as recommended by various subject matter authorities. Only testing objectives which had the unanimous endorsement of these authorities were used for developing test items. After the test items were designed, they were subjected to independent reviews by three reviewers who were qualified to do so. This process helped to improve the test by highlighting problematic items. The end product was a set of 30 test questions which would be trialled in the pilot test phase.

The second section of the instrument was a survey of financial attitudes. The literature revealed that there were desirable attitudes which could be measured. Seven attitude statements were designed which required respondents to rate them on a five-point Likert Scale. Respondents will receive higher scores if their responses reflected that they had more desirable attitudes.

The third section of the instrument was designed to collect background information of the respondents. These variables were thought of to be highly associated with key aspects of financial literacy.

Chapter Four: Data collection and analysis methods

This chapter describes the research samples, methods of data collection and methods of data analysis. The first section describes how the convenience samples for the pilot and main study were obtained. These samples were then compared with national statistics. The next section describes the procedures for data collection which were done in the same manner for both the pilot and main studies. The last section describes the methods of data analysis for the main study in relation to the research questions, nature of the variables and assumptions behind the statistical models used.

4.1 Recruitment of participants

The targeted research participants were all Year 10 (fifteen-year-olds) students. They were recruited from state maintained secondary schools in Oxfordshire and Greater London which gave permission for the research to be carried out. The geographical reach of this research was limited due to financial resources and time. This was a self-funded study and was required by university guidelines to be ideally completed within three to four years.

Secondary schools involved included academies, community schools, foundation schools, grammar schools, faith schools, voluntary-aided schools, free schools and Church of England schools. In July 2012, a list of schools was collated using information from the websites of the Oxfordshire Local Education Authority (LEA) and the 33 LEAs of Greater London. There were 37 schools in Oxfordshire and 428 in Greater London, making it a total of 465 schools.

In August 2012, all 465 schools were invited by electronic mail to take part in the pilot study. Only three schools from Greater London accepted the invitation and took part in the pilot study which was held between October 2012 and December 2012.

To recruit the other participants for the main study, letters of invitation (Appendix B) were sent by post to the rest of the schools in January 2013. This method proved to be more effective than using only electronic mail and resulted in replies from 35 schools from Greater London and 7 schools from Oxfordshire which expressed their interest to take part in the main study. During the course of the data collection period, some schools dropped out of the study. In the end, 23 schools from Greater London and 5 schools from Oxfordshire took part in the main study. The data collection was completed in June 2013.

4.2 Geographical distribution of the participants

All the participants for this research were studying in schools located within Oxfordshire and Greater London. The key criterion was that they had to be in Year 10. Convenience sampling was used which meant that the sample might not be representative of all fifteen-year-olds in England. It is however important to stress that the over-arching aim of the study was not about drawing big inferences about the financial literacy of all the fifteen-year-olds in England. Rather, it was an initial study to gain some understanding this group of young people, so that similar studies can be replicated in the future.

4.2.1 Pilot study

The Year 10 students who took part in the pilot study were recruited from three schools in Greater London. The individual schools' characteristics indicated that there was a well-balanced mix of students of various academic abilities. The first school was a high-performing selective grammar school from Edmonton (London Borough of Enfield). The second school was an above average performing academy in Kenton (London Borough of Harrow) and the third school was an average performing specialist science community college in Wembley (London Borough of Brent) in which majority of its students were non-

White. Table 21 shows the distribution of the pilot study participants by local authorities based on the location of the schools.

Table 21 Distribution of participants across schools by Local Authorities (pilot study)

Local Authority	Number of schools	number of participants	percentage
Enfield	1	175	36.5
Harrow	1	164	34.2
Brent	1	140	29.2
Total	28	479	100.0

In terms of socio-economic background, the free school meals (FSM) statistics by the Department of Education (DFE) showed that there was a good mix of students from different social classes. For the selective grammar school in Edmonton, Enfield, only 3.2% of the students were eligible for FSM. For the academy in Kenton, about 12% of the students were eligible for FSM. For the community college in Wembley, 22% were eligible for FSM.

4.2.2 Main study

All the Year 10 students from 28 schools in Greater London and Oxfordshire were asked to take part in the main study. Table 22 shows the distribution of the main study participants by local authorities based on the location of the schools.

Except for the schools in Oxfordshire, the number of schools from each local authority in London was no more than two. Participation in the study was voluntary and it was not possible to force any school to take part. Overall, the participation rate of schools was only 7%. It could be possible that the low participation rate of schools was due to limited time available for research purposes.

The overall response rate of the students was 82% (3115 cases). Table 23 shows the breakdown of the number of participants and the corresponding response rate for each school. The lowest response rate was 37% and the highest response rate was 99%. The participation rate amongst students was rather high in most schools. This could be due to the nature of the subject as many parents feel that financial literacy is an important aspect of children's education (Capital One, 2011) and about 97% of young people aged 11 to 17 agreed that it is important to learn how to manage money in schools (Personal Finance Education Group, 2010b). Also, the use of opt-out consent forms was permitted as this was considered a very low-risk research exercise where the participants are anonymous and information gathered is voluntary. This also reduced the amount of administrative work that the schools and teachers had to do.

Table 22 Distribution of participants across schools by Local Authorities (main study)

Local Authority	Number of schools	number of participants	percentage
Barnet	1	96	3.1
Bexley	1	195	6.3
Bromley	2	212	6.8
Croydon	1	78	2.5
Enfield	1	116	3.7
Greenwich	1	103	3.3
Hackney	1	20	0.6
Haringey	1	132	4.2
Havering	2	291	9.3
Hounslow	2	245	7.9
Kensington and Chelsea	1	100	3.2
Lewisham	1	68	2.2
Merton	1	162	5.2
Newham	2	299	9.6
Oxfordshire	5	455	14.6
Redbridge	1	194	6.2
Tower Hamlets	1	57	1.8
Waltham Forest	1	111	3.6
Wandsworth	1	30	1.0
Westminister	1	151	4.8
Total	28	3115	100.0

Table 23 Distribution of research participants by schools

Oxford		
School code	Sample size	Response rate(%)
WP	42	37
LM	138	87
MA	36	69
GG	141	91
Greater London		
HA	78	73
SG	116	64
HD	98	66
SE	155	86
UH	162	96
LP	65	43
BP	68	60
MH	96	90
HP	100	92
NP	132	82
LB	20	95
HL	180	92
ST	103	94
SA	130	91
BU	135	84
BW	77	75
HF	111	91
BH	194	94
PA	151	87
PS	174	96
SD	131	98
SJ	57	79
BT	30	51
TG	195	99
Total sample	3115	82

4.2.3 Comparison of samples with national statistics

Table 24 shows how the ethnic composition of the pilot and main study samples compared with national statistics from the 2011 Census (Office for National Statistics, 2012). Compared to both the statistics for England and London, the pilot study sample had an under-representation of White students and an over-representation of Asian and Black students. This could be due to the fact that in one of the pilot school based in Wembley, 92% of their students were non-White. Although the ethnic composition of the main study sample was not similar to that of England, it was rather similar to that of London's. Therefore, it was likely that the main study sample was quite representative of fifteen-year-olds in London.

Table 24 Comparison of samples with national statistics (ethnicity)

	Fifteen-year-olds (England)		Fifteen-year-olds (Oxford)		Fifteen-year-olds (London)		Fifteen-year-olds (pilot study sample)		Fifteen-year-olds (main study sample)	
Ethnicity	count	%	count	%	count	%	count	%	count	%
White	530799	81.6	988	70.1	44622	47.7	110	27.7	1273	44.0
Mixed	26290	4.0	105	7.4	8010	8.6	34	8.6	259	9.0
Asian	57283	8.8	226	16.0	18572	19.8	188	47.5	712	24.6
Black	29693	4.6	72	5.1	18630	19.9	51	12.9	511	17.7
Other	6761	1.0	19	1.3	3765	4.0	13	3.3	137	4.7

Table 25 shows how the participants' gender compared with national statistics from the 2011 census. The gender proportion in the pilot sample was quite similar to London's statistics. However, for the main study sample, there was an over-representation of females. This could be due to the participation of seven all-girls' schools, which contributed about 29% to the total sample size in the main study. When the participants from the all-girls' schools were excluded, the ratio of girls to boys decreased from 1.96 to 1.3. This accounted for the larger proportion of girls who participated in the research. Furthermore, there were 317 cases with missing information on gender. Also, the response rates from all-girls' schools were higher than those from co-ed schools.

Table 25 Comparison of samples with national statistics (gender)

	Fifteen-year-olds (England)		Fifteen-year-olds (Oxford)		Fifteen-year-olds (London)		Fifteen-year-olds (pilot study sample)		Fifteen-year-olds (main study sample)	
Gender	count	%	count	%	count	%	count	%	count	%
Males	333,223	51.2	705	50.0	48615	51.9	223	54.0	945	33.8
Females	317,603	48.8	705	50.0	44984	48.1	190	46.0	1853	66.2

4.3 Data collection procedures

In both the pilot and main studies, the data was collected in the same manner. All the booklets were administered like a typical school test where all the participants had to complete all the entries on their own. The whole booklet, which had three sections, was designed to be completed within one hour. All the teachers involved in the pilot study felt that an hour was sufficient. The length of the instrument was crucial to the information collected. If the instrument was too long, participants might feel tired and give less reliable answers.

The data collection process was planned in such a way that the workload for teachers involved was kept to the minimum. In my correspondences with the schools, I gave them a time period within the school year for the data collection to be completed so they had the flexibility to decide on when to administer the booklet. I offered to help schools with the data collection but most schools preferred to do it themselves. I visited and helped four schools with data collection.

After the schools had informed me about the data collection dates, I would send them the necessary documents. These included: a set of question booklets, a set of answer sheets, instruction scripts for the teachers (Appendix E) and reward lollipops for the participants.

At the start of each survey session, the teachers in charge had to read out the instructions to the students (Appendix E). These instructions reminded participants to fill in the answers only on the answer booklet and that they could use a calculator if they needed to. Participants were also reminded that participation was voluntary. At the end of every data collection session, the teachers in charge would collect all the answer booklets and send them back to me. They were also asked to shred the question papers. Each answer booklet

was coded and checked before its data was entered into a computer program (Microsoft Excel). To ensure that data was entered accurately, they were entered twice and results were analysed separately on these two separate files to check if there were any disparity in results. Any errors in data entry were corrected by referring to the actual answer booklets which were kept in a locked cabinet and only seen by me and my supervisors.

4.4 Ethical considerations

According to Gomm (2004), research ethics are rules of good moral conduct that researchers should follow in a disciplined manner. There are many guidelines available from established organisations such as the British Educational Research Association (BERA), the Economic & Social Research Council (ESRC) and the British Sociological Association (BSA). This research has considered all their guidelines.

Within Oxford University, there is the CUREC (Central University Research Ethics Committee) which oversees the ethical concerns of research projects involving human participants. This research has been given CUREC approval (Appendix A).

The following measures have been complied with to make this an ethically sound research.

1. The participants and their parents were given an information sheet in advance to explain the research aims and procedures (Appendix C). Parents who did not consent to the study could use the opt-out form (Appendix D).

2. Participants could withdraw from the study any time. This was stated clearly on the consent forms and mentioned before the start of each data collection session.

3. The information collected during the research as well as the identity of the schools and student participants who took part were kept confidential. Codes were used to represent the schools and the participants.

4. All the documents collected in this study, such as the answer booklets, opt-out forms and school letters were kept secure and were only accessible to me and my supervisor. These will be destroyed after the study was completed.

4.5 Data analysis methods

Item analysis was carried out on some of the pilot and main study data. This will be discussed in the next chapter. In the main study, the software "IBM SPSS Statistics Version 20" was used to carry out descriptive and further analyses of the data from the main study. Table 26 shows a list of dependent and independent variables which were analysed.

The financial knowledge and skills score, a ratio type of variable, was calculated based on one's overall score on the personal finance test. This score can be broken down into three domains: "Money and transactions" (MT); "Planning and managing finances" (PMF) and "Financial risk and rewards" (FRR). Percentage scores were calculated for ease of comparison and would not make a difference to the interpretation of the statistical findings.

Each participant would also have rated seven attitude statements and be scored accordingly. The scores ranged from 1 to 5. Higher scores were awarded for showing more desired attitudes. These scores have been treated as interval variables, where the degree of desirability was considered continuous on a scale from 1 to 5.

Table 26 Types of variables measured

<table>
<tr><th>Dependent variables</th><th>Description of dependent variables</th><th>Independent variables</th></tr>
<tr><td>financial knowledge and skills</td><td>overall percentage score for all questions in the personal finance test</td><td rowspan="11">personal characteristics
• gender
• ethnicity
• financial behaviour type

educational variables
• whether one was a business studies student
• achievement level for English in Year 9
• achievement level for Mathematics in Year 9

family related variables
• whether one received free school meals
• the approximate number of books in each household
• parents' highest level of education</td></tr>
<tr><td>Domain 1: Money and transactions</td><td>percentage score within domain</td></tr>
<tr><td>Domain 2: Planning and managing finances</td><td>percentage score within domain</td></tr>
<tr><td>Domain 3: Financial risk and rewards</td><td>percentage score within domain</td></tr>
<tr><td>Attitude 1:
"Knowing how to manage money is important to me."</td><td rowspan="7">score by self-assessment
(1 to 5)</td></tr>
<tr><td>Attitude 2:
"Money is there to be spent."</td></tr>
<tr><td>Attitude 3:
"I should start saving money only when I have a paying job."</td></tr>
<tr><td>Attitude 4:
"I would rather earn my own money than to ask my parents for money."</td></tr>
<tr><td>Attitude 5:
"I am comfortable about owing someone money."</td></tr>
<tr><td>Attitude 6:
"I like to compare prices."</td></tr>
<tr><td>Attitude 7:
"I am confident of managing my own money."</td></tr>
</table>

The independent variables were either nominal or ordinal type of variables. The nominal variables were: gender, ethnicity, financial behaviour type, whether one was a business studies student and whether one received free school meals. The ordinal variables were: Year 9 achievement level for English and Mathematics; number of books in a household and parents' highest education level.

Table 27 lists the research questions and the corresponding method of data analysis used.

Table 27 Research questions and method of data analysis

Research question	Methods of data analysis
Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of financial knowledge and skills were found in them based on their performance on the personal finance test?	Descriptive statistics based on percentage of test takers who answered correctly Detailed descriptive statistics by test items and domains.
Which independent variables were significantly correlated with financial knowledge and skills and what was the extent of these relationships, if there were any?	Tests for differences of means to confirm correlates. Bivariate and multivariate tests
Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of desired financial attitudes were found in them based on the results of the financial attitudes survey?	Descriptive statistics based on mean scores for each attitude Distribution of scores for each attitude
Which independent variables were significantly correlated with financial attitudes and what was the extent of these relationships, if there were any?	Tests for differences of means to confirm correlates. Bivariate and multivariate tests
Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what was the extent of the relationships, if any, between their financial knowledge and skills; and their financial attitudes?	Pearson's product-moment correlation

Bivariate tests were carried out on the dependent variable (knowledge and skills scores or attitude scores) before multiple linear regression modelling. This helped to give an overview of the pattern of scores by sub-populations such as males versus females. Both sets of test results were considered in determining the relationships between the variables. Multivariate modelling is particularly useful for determining how much of the variance was attributed to each independent variable by controlling for the influence of other independent variables.

Finally, to determine the relationship, if there was any between the personal finance test scores and financial attitudes, Pearson's product-moment correlation coefficient was used.

4.5.1 Assumptions to be checked for statistical tests used

When multiple linear regression models are used for any statistical analysis, some assumptions need to be checked (Tabachnick and Fidell, 2013). According to Field (2009), if these assumptions are met, the likelihood of generalising the findings to the population of interest is increased. As both the multiple linear regression models and Pearson's product-moment correlation are tests that assume linear relationships, it is necessary to ensure that the distribution of each variable is normal. Tests for normality are over-sensitive and easily violated when samples are large (Field, 2009; Tabachnick and Fidell, 2013); as in the case of this research, so visual inspections of the distribution of variables would be carried out instead.

Besides checking for normality, some important assumptions of multiple linear regressions need to be met (Field, 2009):

1. There is no perfect multicollinearity between two or more independent variables.
2. The variance of the residuals is constant (homoscedasticity). In other words, the residuals of the independent variables should have equal variance. Plot of standardized residuals (errors) against standardised predicted values of the dependent variable is useful to determine whether the assumptions of random errors and homoscedasticity have been met.
3. Residuals are normally distributed with a mean of 0.

The use of Pearson's product-moment correlations requires that the type of variables involved should be either interval variables or nominal variables with two categories. In this study, the personal finance test scores and financial attitude scores were both considered as

interval variables which meant they were both measured on a continuous scale and could be assigned any value along their scales.

4.6 Summary

The research methodology of this study involved gaining access to participants, planning the administration of the survey and analysing the data.

The participants for this research were recruited from schools in Oxfordshire and Greater London. Two batches of participants were recruited for the pilot and main studies. The pilot sample, which consisted of 479 participants were all from London schools and represented fifteen-year-olds of various academic abilities and family background. The main sample which consisted of 3115 participants, were mainly from London and their ethnic mix was similar to that of London's population statistics.

The research was carried out mainly by enlisting the help of school teachers who administered the booklets (research instrument) like a typical school test. The participants were anonymous in the data collection process and any data collected or related to the research was kept confidential. Physical copies of the answer booklets were kept under lock and key.

Descriptive statistics, bivariate and multivariate tests were used to answer the research questions from Chapter One.

Chapter Five: Pilot study

This chapter presents some findings from the pilot study. In addition, various statistical methods were used to evaluate the quality of the items in the personal finance test. The chapter begins with an overview of the findings. This is followed by the item analysis of the personal finance test. A distractor analysis was also carried out. Both analyses identified a few problematic test items which justified their exclusion from the final test.

5.1 Descriptive findings

There were 479 participants in the pilot test. The mean percentage score for the overall test was about 50%. The lowest score on the test was 3.3% and the highest score was 93%. The rest of the descriptive findings are shown in Table 28. The raw scores were converted to percentage scores for ease of comparison between the domain means. For instance, a score of 1 point on the test represents 4% of the total possible score of 100%.

Table 28 Mean percentage scores of financial knowledge and skills test for the pilot study

	N	Mean	Standard Deviation	Median	Mode	Skewness	Kurtosis	Minimum	Maximum
Domain 1: money and Transactions	479	52.3	20.3	50	33.3	0.09	-1.06	3.3	93.3
Domain 2: planning and managing finances	479	51.5	25.5	50	41.7	-0.06	-1.07	0.0	100.0
Domain 3: financial risk and reward	479	42.9	23.2	33.3	23.2	0.12	-0.61	0.0	100.0
Overall: financial knowledge and skills	479	50.1	20.3	46.7	36.7	0.09	-1.06	3.3	93.3

The descriptive findings of the financial attitudes survey are shown in Table 29. The financial attitudes scores were treated as interval type of variables. For each statement, the minimum

score was 1 and the maximum score was 5. Participants scored higher if they agreed more with the positively phrased statements and if they disagreed more with the negatively phrased statements. The mean attitude scores reflected the average of all the participants' scores on that particular attitude measured. In the pilot sample, "Attitude 1" had the lowest mean score. On the other hand, "Attitude 5" had the highest mean score. The results indicated that for this sample, more efforts need to be made to improve their awareness of the importance of being financially literate; their confidence in managing their money; being financially independent and wanting to compare prices.

Table 29 Mean scores of various attitudes for the pilot study

	N	Mean	Standard Deviation	Median	Mode	Skewness	Kurtosis
Attitude 1: Knowing how to manage money is important to me.	478	2.64	2.61	2.00	1.00	1.87	1.91
Attitude 2: Money is there to be spent	478	3.58	2.33	3.00	3.00	1.56	1.29
Attitude 3: I should start saving money only when I have a paying job.	478	4.07	2.33	4.00	4.00	1.06	0.38
Attitude 4: I would rather earn my own money than to ask my parents for money.	478	3.15	2.59	2.00	2.00	1.52	0.97
Attitude 5: I am comfortable about owing someone money.	478	4.10	2.30	4.00	4.00	1.06	0.32
Attitude 6: I like to compare prices.	478	3.17	2.54	2.00	2.00	1.58	1.13
Attitude 7: I am confident of managing my own money.	478	3.06	2.56	2.00	2.00	1.63	1.24

Overall, there was no adverse feedback from the participants and school teachers about the instrument in general. The amount of time needed to complete the instrument was well within an hour. There were no complaints about the clarity of test items and attitude statements. The next section presents the item analysis of the personal finance test items.

5.2 Item analysis of the personal finance test items

Item analysis is an essential process in test development to evaluate test items and ensure that they are fit for the purpose of the test (Ellis and Mead, 2002). Traditionally, item analysis justifies the selection of items for test assembly (Gulliksen, 1950; Crocker and Algina, 2008). This is an important process because inferences about the test takers are made from the test results.

Many research studies which were carried out before 2010, used the testing method to assess financial knowledge but did not carry out any item analysis of the test items (for example, Chen and Volpe, 1998; Bowen, 2002; Beal and Delpachitra, 2003; Manton et al, 2006; Varcoe et al, 2005; Robb and Sharpe, 2009; Walstad et al, 2010). In recent years, item analysis has been applied in some financial literacy research studies (Knoll and Houts, 2012; Kunovskaya et al, 2014; Schwella and van Nieuwenhuyzen, 2014).

Omitting item analysis does not mean that a test is not valid; in fact most of the financial knowledge tests had been checked for content validity by experts in the field. It is hoped that the instrument designed for this research will become one of the key instruments for assessing financial literacy. Hence it was necessary to ensure the content and construct validity of the instrument by means of expert reviews and item analyses.

5.3 Theoretical frameworks for item analysis

A test can be evaluated using different theories. Two such theories are: the Classical Test Theory (CTT) and the Item Response Theory (IRT). IRT has also been known as the "Modern Test Theory". The CTT was developed by Spearman (1907, 1913) and was the standard psychometric framework used in test development before IRT. The CTT is a simple, linear model with three components: the observed score on a test, the true score and the error.

observed score = true score + error

The CTT assumes that the observed score of a test-taker is an estimate of the true score within a margin of unobservable measurement error. However, this means that the test-taker's true score is highly dependent on the test content. If the test content is too difficult or easy, the error margin becomes wider and makes it harder to be gauge where the true score lies. Conversely, the CTT index for item difficulty could vary, depending on the ability of the test-takers. This makes it difficult to compare results across different tests.

Since the 1970s, the IRT has become the gold standard for item analysis and has been regarded by many to be the most important theoretical framework used for item analysis (Hambleton, Swaminathan and Rogers, 1991; Schultz and Whitney, 2005; Crocker and Algina, 2008). The IRT overcomes the problems of CTT by assuming that the latent ability of a test-taker is independent of the test content. It does this by using sets of probabilistic models to describe the relationship between a test taker's ability or trait level (often referred to as θ or theta) and the probability of a correct response to any test item (Lord and Novick, 1968). IRT assumes that a test taker's response to an item is related to their latent trait and this relationship is modelled by an S-shaped curve also known as an item characteristic curve (ICC).

An ICC reflects the estimated parameters graphically and indicates the probability of getting an item correct for various trait levels or theta. Each ICC can be mathematically represented as:

$$P_{ij}(\theta_j) = c_i + (1 - c_i)\frac{e^{1.7a_i(\theta - b_i)}}{1 + e^{1.7a_i(\theta - b_i)}}$$

Where P_{ij} represents the probability of a correct response to item i by person j,

θ_j is the trait level or proficiency for person j,

a_i is the discrimination parameter for item i

b_i is the difficulty parameter for item i

c_i is the "pseudo-guessing" parameter for item i.

Figure 4 is an example of an ICC. The smooth line represents the theoretical distribution of probabilities to get the item correct based on the estimated parameters for the item. The uneven line shows the actual proportion of participants (y-axis) against their estimated Theta values. In general, the distributions show that as Theta increases, the likelihood of getting the item correct also increases.

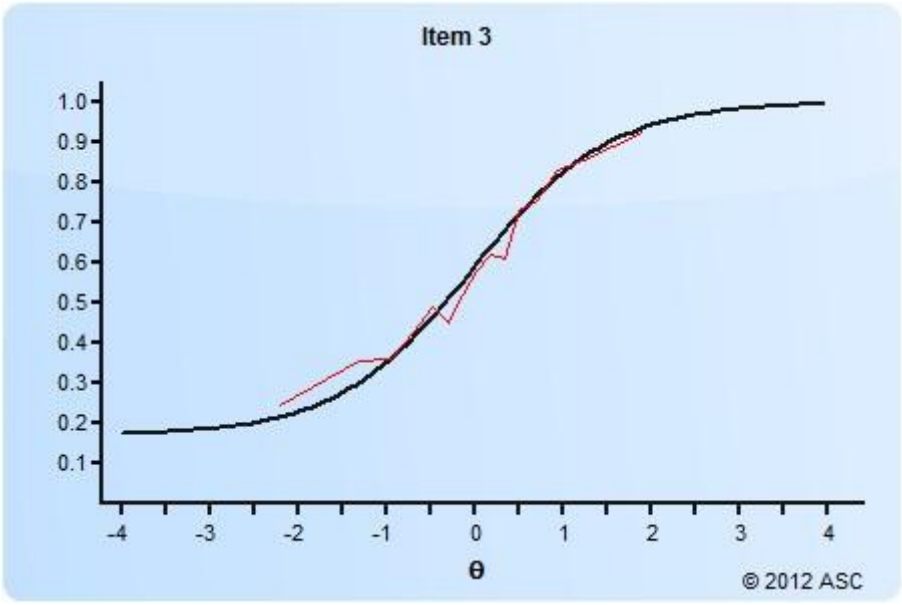


Figure 4 An example of an item characteristic curve (ICC)

The item discrimination parameter is indicated by the "a" value. A higher "a" value means that the item is highly discriminating between test takers of different trait levels. The "a" value represents the slope of the ICC. In 1-PL models, also known as Rasch model, the "a" value is held constant at 1.0 for all test models.

The item difficulty parameter or the “b” value is defined as the likelihood of a correct response. This index has the same metric as the proficiency or traits measured. The “b” value shows the proficiency at which half of the test takers are most likely to answer the item correctly. For example, if the “b” value for an item is 1.0, then about 50% of the test takers with proficiency of 1.0 are likely to get the item correct. The more difficult an item is, the higher the “b” value will be. The assumption is that if fewer students can answer an item correctly, a high level of proficiency or “b” value is needed.

The guessing parameter is indicated by the “c” value. Its value indicates the likelihood of getting a correct answer through guessing.

5.4 Item Response Theory framework for item analysis

The IRT framework was considered in the first instance to analyse the items in the financial knowledge test. Before arriving at the relevant IRT indices, it was necessary to verify the basic assumptions of any IRT model. Once the assumptions were fulfilled, a suitable IRT model was chosen. In this process, CTT indices were used to justify the choice of IRT model (Wiberg, 2004). This will be presented in the next section. Based on the chosen IRT model, the appropriate IRT statistics will then be presented. These, along with the distractor analyses that follows, justified the removal of some problematic test items.

5.4.1 Verifying assumptions of IRT models

An important assumption for any IRT model is that the test should measure only one latent ability. Two forms of evidence indicated this. Firstly, the Cronbach’s Alpha (Cronbach, 1951) value of the pilot test was found to be .845. This not only indicated that there was a high internal consistency within the test but also suggested unidimensionality. Secondly, a factor analysis was carried out using orthogonal rotation (varimax). The Kaiser-Meyer-Olkin

measure, which was .89, verified the sampling size for analysis. According to Field (2009), this was above the acceptable limit of .5. Bartlett's test of sphericity X^2 (435) = 2621.58, *p*<.001, which indicated that correlations between items were sufficiently large for principal component analysis. An initial analysis was run to obtain eigenvalues for each component in the data. As can be seen in the scree plot in Figure 5, the factor analysis produced one distinct factor and many small factors. The first factor had an eigenvalue of 6.3 and accounted for 21% of the variance.

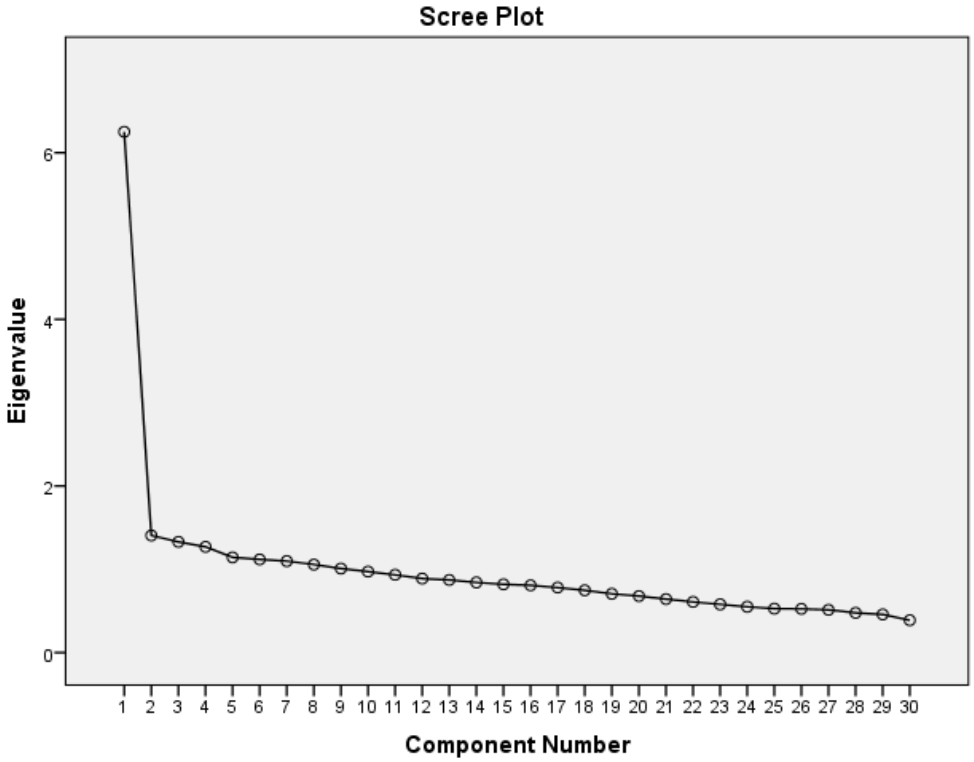


Figure 5 Scree plot showing unidimensionality

According to Wiberg (2004), as long as there was one factor with a distinct large eigenvalue, it was sufficient to assume that there was unidimensionality in the test.

The other important criteria was local independence. This could be assumed if answers to test items could not be inferred from answers to other items in the same test (Wiberg,

2004). All the pilot test items were examined and as shown in Table 30, there were no parallel items or items with the same testing objectives.

Table 30 Specific testing objectives of pilot test items

Item number	Specific testing objectives
1	Know about using overdrafts.
2	Understand the nature of a transaction involving a credit card.
3	Able to convert between different currencies given the exchange rates.
4	Able to understand entries in a bank statement.
5	Able to calculate prices of possible purchases.
6	Able to calculate interest rates.
7	Understand how bank charges are likely to be incurred.
8	Have a basic understanding of the use of ATM cards.
9	Able to calculate the unit prices of products (or use other strategies) to compare prices.
10	Know about various methods of payment.
11	Able to calculate interest earned given the beginning balance and annual interest rate.
12	Able to calculate the total amount payable in a purchase transaction.
13	Understand that income earned may be fixed or variable depending on the terms of employment.
14	Able to calculate income earned.
15	Understand how finance charges vary based on one's circumstances.
16	Able to understand parts of a payslip.
17	Understand deductions made from one's salary.
18	Able to make sound decisions to balance a budget.
19	Able to make sound choices that are likely to increase one's savings.
20	Able to examine one's budget to plan for a future expense.
21	Able to understand the impact of compound interest on savings in bank accounts.
22	Able to understand the impact of compound interest on debts like those held on credit cards.
23	Know what taxes are used for.
24	Understand that expenditures are sometimes necessary to bring in future benefit.
25	Know the basic relationship between potential risk and reward in the context of making financial investments.
26	Know what inflation is.
27	Understand the term "excess" used in insurance policies.
28	Understand what a shareholder is entitled to as a result of making a financial investment.
29	Know about the relative risks of basic financial products such as foreign currencies, shares, bonds and savings products.
30	Understand that actions which increase risk are likely to increase the insurance policy premiums one has to pay.

5.4.2 Selecting an IRT model

Having fulfilled the assumptions of unidimensionality and local independence, a choice of IRT model needed to be made. There are three main types of IRT models which can be used for analysing test data whose answers are dichotomous in nature (De Ayala, 2009; DeMars, 2010)

The 1 parameter (1-PL) model, which is mathematically equivalent to the "Rasch Model", has only one parameter estimated for each test item which is about the item's difficulty. The 1-PL model is used if all the items have equal discrimination. In the 2 parameters (2-PL) model, parameters of discrimination and difficulty are estimated for each item. In the 3 parameters (3-PL) model, parameters for discrimination, difficulty and guessing are estimated.

To check whether all the items had equal discrimination, CTT statistics were used. Table 29 shows the CTT statistics for each item. Under the CTT statistics, "P" represents the p-value or difficulty of the item. It shows the proportion of test takers who have answered the item correctly and the value ranges from 0 to 1. "Rpbis" refers to the point-biserial correlation statistic. It is the index for item-total correlation which refers to the correlation of the scores on an item with the total scores of all the items. The "Cronbach's Alpha without item" statistic shows how the Cronbach's Alpha of the test of .845 would change if the item was removed. If Cronbach's Alpha increases significantly when an item is removed, it means that the item is problematic. Both the "Rpbis" and "Cronbach's Alpha when deleted" are indices of item discrimination under the CTT framework. As shown in Table 31, the items did not have equal discrimination, therefore the use of the 1-PL model would be unsuitable.

Table 31 CTT statistics

	CTT statistics		
Item number	P	Rpbis	Cronbach's Alpha without item
1	.76	.27	.843
2	.27	.32	.842
3	.63	.42	.839
4	**.11**	**-.13**	**.851**
5	.44	.28	.843
6	.58	.38	.840
7	.63	.45	.838
8	.68	.30	.843
9	.66	.51	.836
10	.57	.34	.842
11	.58	.49	.837
12	.37	.51	.836
13	.51	.42	.839
14	.52	.52	.836
15	**.27**	**.13**	**.847**
16	.71	.37	.841
17	**.28**	**.10**	**.848**
18	.65	.47	.837
19	.55	.49	.837
20	.63	.55	.835
21	.41	.43	.839
22	.45	.45	.838
23	.63	.53	.835
24	.55	.49	.837
25	**.44**	**.14**	**0.848**
26	.54	.49	0.837
27	**.18**	**-.09**	**0.852**
28	.46	.23	0.845
29	.46	.30	0.843
30	.49	.43	0.839

To assess whether a guessing parameter should be estimated, the performance of the bottom 10% test-takers on the most difficult five items as indicated by the difficulty statistic (p-value) from CTT, were examined. Based on the p-values in Table 32, the five most difficult items in the pilot test were 4, 27, 2, 15 and 17. In Table 30, their p-values were arranged in descending order with the most difficult item first.

Table 32 Performance of bottom 10% on the 5 most difficult items

Item number	P-values	Percentage who answered correctly
4	.11	14.3
27	.18	14.3
2	.27	10.2
15	.27	12.2
17	.28	10.2

There were 479 test-takers in the pilot study and based on the total scores, the bottom 10% or 49 of them had percentage scores ranging from 3.3% to 23.3%. Within these 49 test-takers, some were able to answer the five most difficult items correctly and the statistics are shown in Table 30. These indicated that there were more low-performers who answered the more difficult items correctly. For instance, even though item 4 was more difficult than item 2, more (14.3%) of the low performers were able to answer item 4 correctly, as compared to item 2 (10.2%). This suggested that there was some degree of guessing and hence the 3-PL model was used rather than the 2-PL model.

5.4.3 The IRT parameters

Having decided on the 3-PL model, the pilot test data was run on a program called "XCalibre version 4.1.8" (Assessment Systems Corporation, 2012) which used the expected-maximization approach to estimate the item parameters. The IRT parameters are shown in Table 33.

Table 33 IRT parameters (30 items)

	IRT parameters		
Item number	a	b	c
1	1.05	-1.05	.19
2	2.11	1.29	.17
3	1.59	-.22	.19
4	**2.30**	**3.07**	**.15**
5	1.29	.76	.19
6	1.45	.04	.19
7	1.77	-.20	.18
8	1.16	-.51	.19
9	2.02	-.32	.18
10	1.33	.12	.19
11	1.91	.02	.18
12	2.60	.71	.16
13	1.54	.29	.18
14	2.46	.24	.19
15	**1.54**	**1.93**	**.20**
16	1.38	-.62	.19
17	**1.38**	**2.000**	**.20**
18	1.90	-.32	.18
19	2.35	.14	.19
20	2.78	-.20	.18
21	1.73	.64	.17
22	2.33	.53	.19
23	2.41	-.17	.19
24	2.23	.12	.19
25	**0.96**	**1.08**	**.20**
26	2.17	.16	.18
27	**2.17**	**2.89**	**.18**
28	1.17	.75	.20
29	1.36	.61	.19
30	1.71	.36	.18

Item characteristic curves (ICC) were generated for all items and can be found in Appendix L.

Based on Table 31, five items (4, 15, 17, 25, 27) were highlighted (in bold) for consideration to be removed from the test. Items 4, 15, 17 and 27 were flagged by the IRT software as a poor fit to the 3-PL model because their b values were too high, suggesting that these items were so difficult that very few test takers were able to answer them correctly. Item 25 was highlighted because it had the lowest “a” value which suggested that this item might not be

discriminating enough. The IRT statistics presented a strong basis for these items to be examined.

5.5 Distractor analysis

The statistics obtained from carrying out a distractor analysis adds more insight into the item analysis process (Meyer, 2014). Distractors refer to the incorrect response options given in multiple-choice questions. The percentage of test-takers who endorsed each distractor gives information about the feasibility of the distractor; large values may indicate that an item or its distractor is problematic. For instance, an item might be ambiguous or confusing. Or, a distractor might be a possible correct answer. Table 34 shows the distribution of options selected for each test items. Ideally, the correct option should have the highest percentage of endorsement. It was noted that items 2, 4, 15, 17, 25 and 27 could be problematic as more test-takers endorsed the distractors than the correct option.

Table 34 Distribution of options in test items

	Distribution of options selected (%) *Key indicated by **			
Item	Option A	Option B	Option C	Option D
1	5.6	5.0	76.4**	11.3
2	**27.1****	**4.2**	**4.4**	**64.3**
3	63.3**	10.0	24.8	1.0
4	**11.9**	**11.5****	**66.8**	**8.1**
5	7.3	44.3**	40.3	7.3
6	10.0	10.0	20.0	58.0**
7	9.0	15.7	11.5	62.6**
8	7.3	7.1	16.7	68.3**
9	65.8**	14.8	12.9	6.1
10	18.0	56.8**	18.0	6.3
11	11.5	57.6**	12.9	16.9
12	12.3	21.1	28.0	36.5**
13	50.7**	17.1	12.9	16.7
14	8.4	13.2	25.1	51.8**
15	**20.3**	**27.1****	**14.2**	**36.7**
16	10.9	71.2**	14.4	3.1
17	**33.2**	**14.6**	**21.5**	**28.4****
18	15.4	8.8	10.0	65.3**
19	14.6	14.6	55.3**	14.6
20	9.8	16.1	63.3**	10.4
21	11.1	27.8	18.6	41.3**
22	45.3**	18.8	19.6	15.0
23	12.1	14.2	62.6**	9.2
24	10.9	55.3**	10.6	21.7
25	**14.6**	**43.8****	**22.1**	**17.7**
26	53.7**	10.6	20.3	13.6
27	**18.2****	**30.5**	**37.0**	**11.9**
28	20.0	14.4	46.1**	16.9
29	11.9	29.6	46.3**	10.6
30	15.4	49.1**	13.2	20.7

The relationship between a distractor and the total test score can be examined using the distractor-total correlations. Test-takers with higher scores should be less likely to select a distractor so negative distractor-total correlations are ideal. The point-biserial correlation of each option with the total score (S-Rpbis) was calculated and the results are shown in Table 35.

Table 35 Distractor-total correlations (S-Rpbis)

	Distractor-total correlations (S-Rpbis) *Key indicated by ** *			
Item	Option A	Option B	Option C	Option D
1	-.193	-.174	.266**	-.110
2	.316**	-.101	-.181	-.174
3	.415**	-.180	-.286	-.140
4	**-.169**	**-.132****	**.291**	**-.098**
5	-.227	.277**	-.090	-.112
6	-.019	-.273	-.221	.377**
7	-.239	-.200	-.246	.454**
8	-.205	-.210	-.075	.298**
9	.509**	-.312	-.237	-.197
10	-.072	.340**	-.203	-.213
11	-.263	.486**	-.205	-.201
12	-.219	-.295	-.082	.508**
13	.419**	-.191	-.222	-.145
14	-.228	-.320	-.170	.519**
15	**-.118**	**.130****	**-.274**	**.190**
16	-.341	.365**	-.102	-.128
17	**.195**	**-.248**	**-.098**	**.103****
18	-.177	-.254	-.281	.470**
19	-.207	-.213	.492**	-.257
20	-.259	-.294	.553**	-.259
21	-.160	-.118	-.274	.432**
22	.445**	-.269	-.143	-.136
23	-.269	-.298	.533**	-.183
24	-.257	.491**	-.230	-.210
25	**-.137**	**.135****	**-.100**	**.065**
26	.494**	-.257	-.182	-.223
27	**-.088****	**.038**	**.186**	**-.192**
28	.108	-.311	.233**	-.115
29	-.239	-.021	.302**	-.210
30	-.241	.431**	-.253	-.101

Results from Table 35 show that items 4, 15, 17, 25 and 27 could be problematic. Items 4 and 27 had negative distractor-total correlations for its key which meant that test-takers with lower total scores were choosing the correct option more frequently than those with higher total scores. Items 15, 17 and 25 had distractors with positive distractor-total

correlations for both the key and one other distractor. These items and their distractors needed to be examined.

Although Item 2 was flagged previously because more test-takers selected the distractors than the key, the distractor-total correlations showed that the key had a high distractor-total correlation which implied that more knowledgeable test-takers were getting this item correct. Further examination of the item (including the distractors) confirmed that the item was clear and valid.

5.6 Problematic test items

This section presents a detailed analysis of items 4, 15, 17, 25 and 27.

Item 4

Ann has a current account which comes with a debit card and cheque book. Exhibit A shows her bank statement for the month of May 2012.

Based on the bank statement, calculate the total amount that Ann **spent** in May 2012.

A. £325
B. £675
C. £715
D. £755

Answer: B

Exhibit A

Ann's bank statement for May 2012

SERENITY BANK

Current Account Statement 31 May 2012

Ann Woods
10 High Street
London
SW1B 2AB Sort code: 37-14-38 Account number: 19740378

Date	Description	Credit (£)	Debit (£)	Balance (£)
1 May	Beginning Balance			850
2 May	Monthly Bus Pass		45	805
5 May	Paul's Supermarket		50	755
15 May	Direct debit: Utilities Bill		100	655
16 May	Cheque: rent for May		400	255
18 May	Liberty Store purchase		60	195
20 May	Salary	1000		1195
21 May	Paul's Supermarket		60	1135
25 May	Refund: Liberty Store	40		1175
31 May	Statement closing balance			1175

Useful Information

Checking your statements

Please read through the entries on your statement. If you think something is incorrect, please contact us straight away on 0845 6 000 000 and we will check it for you. The earlier you contact us regarding a disputed entry, the more we may be able to do. Take care when storing or disposing of information about your account.

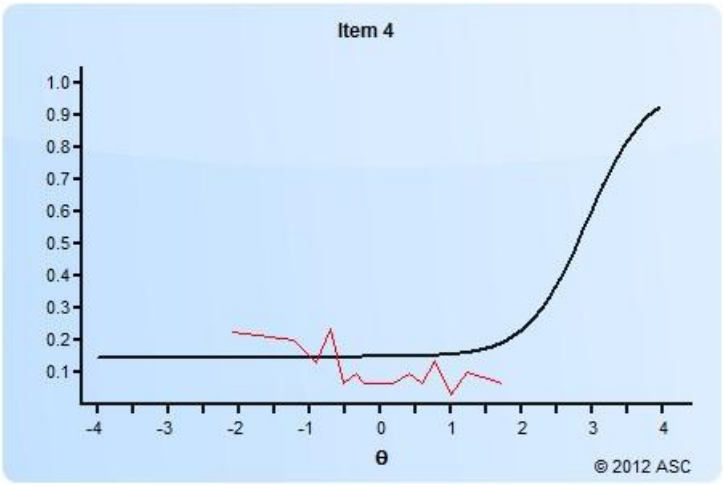
Interest rates

You can find out the interest rates that we have used to calculate any interest you have earned or been paid by clicking 'Find out more about our interest rates and charges' link under your online statement, by visiting www.serenitybank.com or your local branch by calling our interest rate line on 0845 600 9988 (8am-9pm Monday-Friday and 9am-5pm Saturday-Sunday)

Personal Debit and Cashpoint® Card Charges

Whenever you use your card to withdraw cash or make a payment in currencies other than in sterling, the amount is converted to sterling on the day it is processed by Visa, using their standard exchange rate that day. We also include a foreign exchange fee of 2.99%. Please check our Banking Charges guide, visit www.serenitybank.com, call us on 0845 6 000 000 or visit any Serenity Bank Branch for the other charges that apply.

IRT Parameters for Item 4



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.297	3.068	0.147	0.505	0.579	0.066	21.188	12	0.048	1.449	0.147

The IRT statistics show that the “b” parameter was quite high at 3.068 and this indicated that the item was extremely difficult. The standard error for “b” was also quite high compared to the other items.

The objective of this item was to test one’s ability to extract information from a bank statement for a specific purpose. This item required the test taker to work out how much was spent in the month given the information about debits and credits made to the account. One way to work out the answer was to add up the debits and subtract the credit of £40 due to a refund. However, there was insufficient information about the nature of the refund of £40, that is, whether this was made to a purchase in the month of May or otherwise. Hence, it was also correct to assume Option C as the right answer. Due to the ambiguous nature of the correct answer, this item was omitted from the main survey.

Item 15

Scott and Eric are young men. Each has a good credit history. They work at the same company and earn the same salary. Scott has borrowed £6,000 to pay for a luxury holiday. Eric has borrowed £6,000 to buy a car. Who is likely to pay the lower finance charge?

A. They will both pay the same because the rate is fixed.

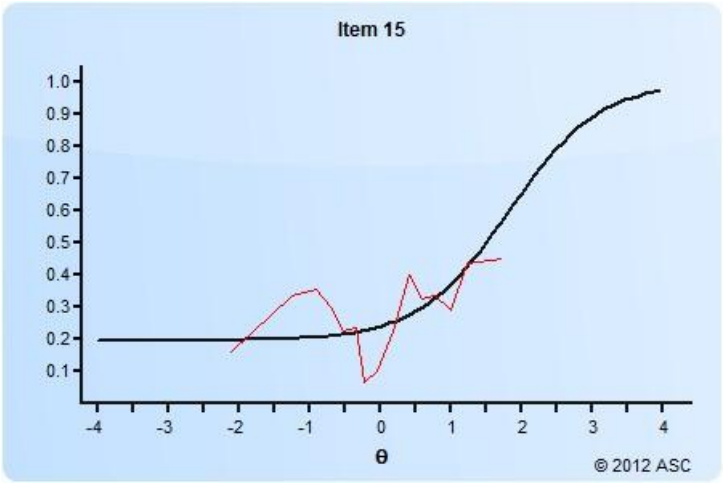
B. Eric will pay less because the car is collateral for the loan.

C. Scott will pay less because people who travel overseas are likely to repay their loans.

D. They will both pay the same because they have almost identical financial backgrounds.

Answer: B

IRT Parameters for Item 15



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.537	1.926	0.195	0.180	0.173	0.086	21.496	12	0.044	0.790	0.429

The IRT statistics show that Item 15 had one of the highest “b” values amongst all the items in the test. This suggested that the item was fairly difficult for most test takers and should be removed.

The objective of the item was to test one’s knowledge about finance charges. The item was adapted from an existing test instrument (Mandell, 2009a). However, given that there could be some ambiguity in the answer, this item was removed. Financial products, especially loans, might differ in the way they are sold in the United Kingdom. Finance charges for a car might not always be lower than interest rates for a cash loan as bank products, promotions, terms and conditions might vary greatly.

Item 17

The figure below shows Ms Penny's most recent payslip.

Use it to answer Questions 16 and 17.

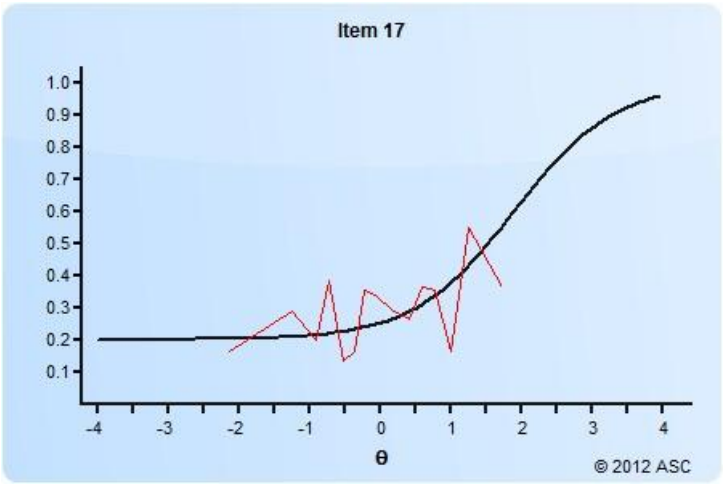
Name	National Insurance number	Pay Date	Tax Code
Ms Penny	SL 49 78 56 B	25 Oct 2012	BR
Payments		**Deductions**	
Description	**Amount**	**Description**	**Amount**
Gross Pay	£2000	PAYE Tax	£410
Overtime	£100	Student Loan	£30
		National Insurance	£200
		Company Pension	£130
Total Gross Pay	£2100	**Total Deductions**	£770
		Net Pay	£1330

Which of the following deduction(s) in the payslip above contribute to state benefits in the UK?

A. PAYE Tax
B. Company Pension
C. National Insurance
D. National Insurance and PAYE Tax

Answer: D

IRT Parameters for item 17



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.384	2.000	0.201	0.174	0.188	0.088	24.019	12	0.020	0.646	0.518

The IRT statistics show that this item had one of the highest “b” values amongst all the items in the test. This suggested that the item was fairly difficult for most test takers and should be removed.

The objective of the item was to test one’s knowledge about the government’s sources of funding for welfare and benefits. The allocation of resources for welfare and benefits is complicated and ever-changing. Furthermore, there is a weak relationship between knowing the answer to this item and one’s ability to manage one’s personal finances. Hence, this item was removed.

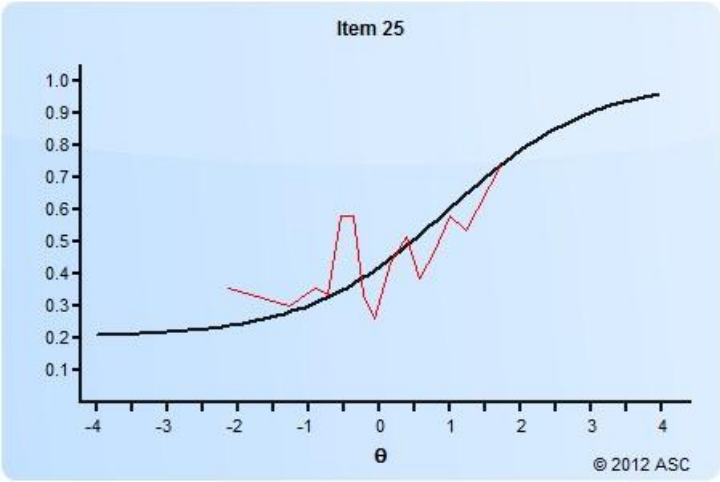
Item 25

What is the general relationship between risk and potential reward with regards to financial investments?

A. The higher the risk, the lower the potential reward.
B. The higher the risk, the greater the potential reward.
C. The amount of risk does not influence potential reward.
D. There is no general relationship between risk and potential reward.

Answer: B

IRT Parameters for Item 25



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.964	1.080	0.203	0.162	0.154	0.117	24.142	12	0.019	1.005	0.315

The IRT statistics and distractor analysis showed that this item was fit for testing purposes. However, there could be some ambiguity linked to the correct answer and hence this item was removed. The distractors could be confusing for test-takers.

Item 27

Mandy bought travel insurance to insure herself during her holiday overseas. While on holiday, she lost £300 to pickpockets.

Below shows part of the travel insurance policy schedule.

Description	Limit	Excess
Loss of cash	£250	£20
Loss of documents	£250	£50

Covered

You are covered up to the amount specified on your policy schedule for accidental loss or theft of your own cash and/or documents. Cash is only covered whilst being carried on yourself or left in a locked safety deposit box.

Not Covered

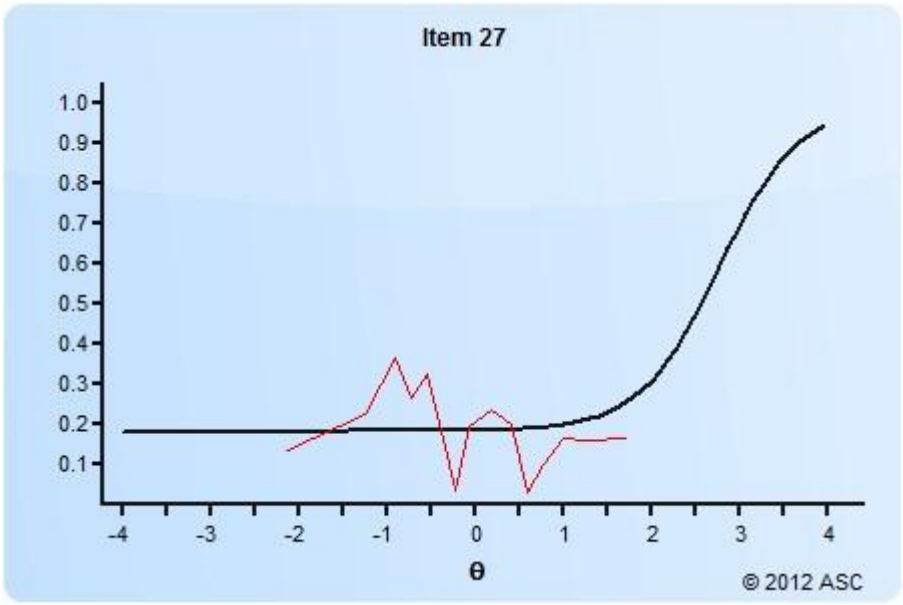
1. *The policy excess as specified on your insurance schedule.*
2. *If you do not exercise reasonable care in protecting your cash and documents against loss, theft or damage.*
3. *If you do not obtain a written police report within 48 hours of the discovery in the event of loss, burglary or theft of cash and/or documents.*

If Mandy's claim was successful, how much will the insurance company pay her?

A. £230
B. £250
C. £270
D. £300

Answer: A

IRT Parameters for Item 27



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.165	2.892	0.182	0.422	0.465	0.073	26.401	12	0.009	1.120	0.263

The IRT statistics show that this item had one of the highest five “b” values of all the items in the test at 2.892. This suggested that the item was quite difficult for most test takers and should be removed.

The objective of this item was to test one’s knowledge about basic insurance terms like “limit”, “excess” and “claim” by using a hypothetical situation to determine the amount of insurance pay-out amount. The item was removed mainly as it was too difficult and the context of the item would be unfamiliar to most fifteen-year-olds.

Table 36 summarises the problems found in each of the five items which were removed.

Table 36 Summary of problems found

Item number	Reason
4	Possibility of 2 correct options
15	Item lacked objectivity
17	Item was poorly linked to financial literacy
25	Answer was ambiguous and distractors were confusing.
27	Item was not suitable for most fifteen-year-olds

5.7 Item analysis results for 25 items test

The test data was run again using the XCalibre software, this time omitting the five items to check whether the quality of the test has improved.

Table 37 presents the IRT parameters of the 25 test items. The ICC can be found in Appendix M. According to Ellis and Mead (2004), if there were no test items with very low a values; high b values (2 and above) and c values higher than .40, the test should be fit for its purpose.

Table 37 IRT parameters of 25 item test

	IRT Parameters		
Item number	a	b	c
1	1.05	-1.04	0.19
2	2.02	1.33	0.16
3	1.60	-0.20	0.18
5	1.28	0.77	0.19
6	1.45	0.05	0.19
7	1.78	-0.19	0.18
8	1.16	-0.49	0.19
9	2.01	-0.30	0.18
10	1.30	0.13	0.19
11	1.93	0.04	0.18
12	2.62	0.72	0.16
13	1.53	0.30	0.18
14	2.45	0.25	0.18
16	1.40	-0.60	0.18
18	1.92	-0.30	0.18
19	2.35	0.15	0.19
20	2.81	-0.17	0.18
21	1.76	0.65	0.17
22	2.26	0.54	0.19
23	2.43	-0.15	0.18
24	2.26	0.12	0.18
26	2.22	0.17	0.18
28	1.17	0.76	0.20
29	1.37	0.62	0.19
30	1.75	0.37	0.18

In IRT, the concept of information replaces the CTT concept of reliability. The information function shows how much information is provided by the test. As shown graphically in Figure 6, in the 30 item test, the maximum information was 13.233 at Theta = .250. The standard error of measurement was .275.

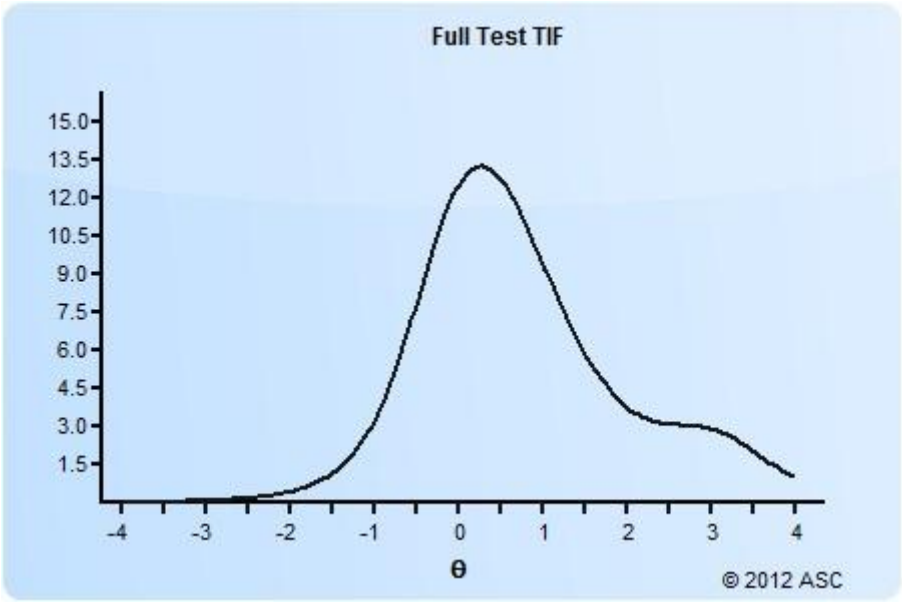


Figure 5 Item Information Curve (30 items test)

The test information function of the 25 item test is shown graphically in Figure 7. For this test, the maximum information was 13.256 at Theta = .250. There has been a slight improvement in terms of test information and standard error of measurement (.274).

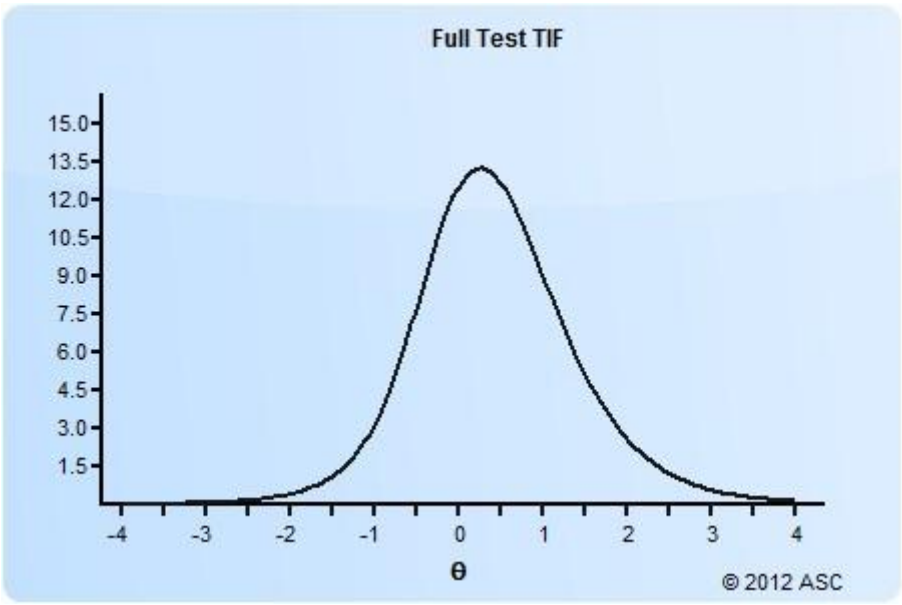


Figure 6 Item Information Curve (25 items test)

The final survey used in the main study can be found in Appendix J.

5.8 Summary

The piloting of a newly designed instrument is critical. The feedback from participants can help to correct errors which improve the quality of the instrument. On the whole, there was no adverse feedback from the participants and teachers about the clarity of the questions in the instrument. In the pilot study, 479 participants attempted the pilot instrument which included a personal finance test with 30 multiple choice test items. Using item analysis and distractor analysis, five items were identified as potentially problematic. After examining these items and identifying the probable reasons, a decision was made to exclude these items. After the problematic items were removed, the test improved both the difficulty and discriminatory parameters of the test items. There was also a slight improvement of the test information which meant that the reliability of the test was also improved.

Chapter Six: Findings of the main study

The main objective of this study was to design an instrument that can be used to measure the key aspects of young people's financial literacy. The processes and rationale behind the design of this instrument are described in Chapters One to Five. The final instrument is able to produce two key measures of financial literacy: a combined measure of financial knowledge and skills; and attitudes towards personal finance (financial attitudes). This chapter will present the findings obtained from administering the final instrument to 3115 participants in the main study by answering the research questions described in Chapter One.

6.1 Financial knowledge and skills

The "financial knowledge and skills" (FKS) aspect was measured using a personal finance test of 25 multiple choice questions. The test is typical of a norm-referenced test where the scores are used to compare the performance of the test takers to one another. There are no pass/fail scores. The overall score for each respondent was broken down into three domain scores: "Money and Transactions" (MT), "Planning and managing finances" (PMF) and "Financial risk and rewards"(FRR).

6.1.1 Overall findings

Sections 6.1.1 to 6.1.4 answer the following research question:

> *Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of financial knowledge and skills were found in them based on their performance on the personal finance test?*

The general descriptive findings are shown in Table 38. The mean percentage score for the overall test was about 56%. The lowest score on the test was 0% and the highest score was 100%. The highest mean percentage score was achieved in the PMF subscale at about 57%. A comparison of the standard deviation for each domain showed that the most variance was found in the PMF subscale. This subscale also had the highest median percentage score of about 60%. Figures 7, 8, 9 and 10 show the distribution of percentage scores for the overall test as well as for each domain.

Table 38 Mean percentage scores for the Personal Finance Test and its domains

	n	Mean	Standard Deviation	Median	Skewness	Kurtosis	Minimum	Maximum
Domain 1: Money and Transactions	3115	55.84	22.49	54.55	-0.04	-0.75	0.00	100.00
Domain 2: Planning and managing finances	3115	57.28	24.89	60.00	-0.22	-0.85	0.00	100.00
Domain 3: Financial risk and reward	3115	52.96	20.26	50.00	-0.20	-0.85	0.00	100.00
Overall test: Financial knowledge and skills	3115	55.96	20.26	56.00	-0.08	-0.82	0.00	100.00

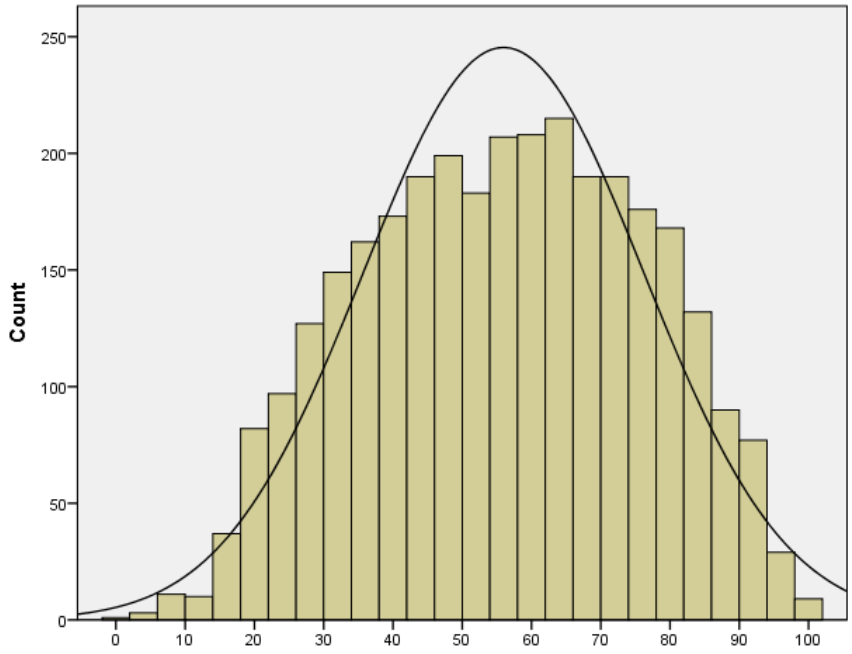


Figure 7 Distribution of percentage scores for the overall test

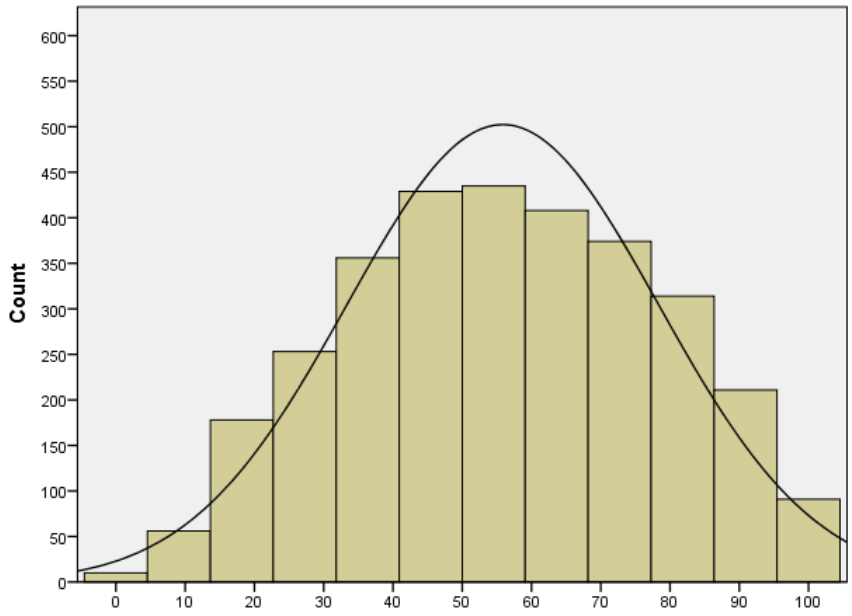


Figure 8 Distribution of percentage scores for Domain 1: Money and transactions

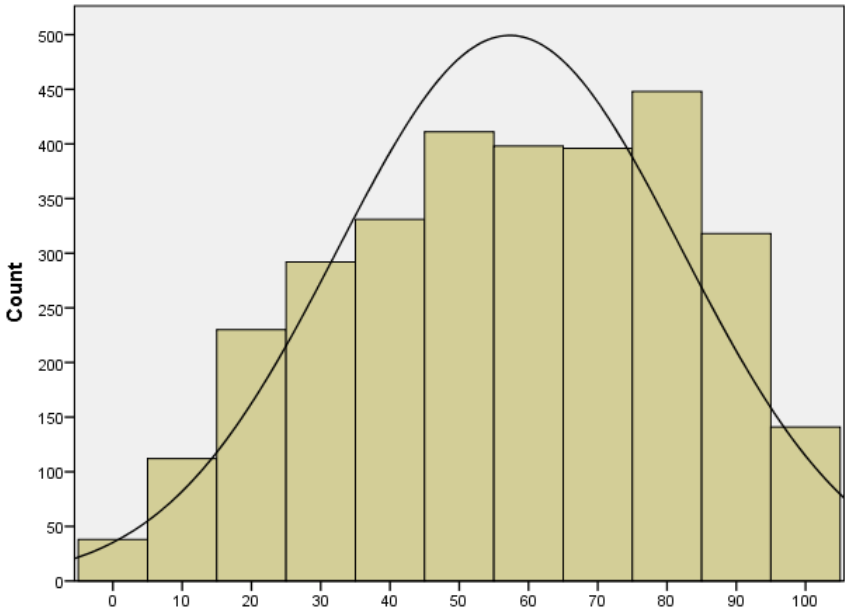


Figure 9 Distribution of percentage scores for Domain 2: Planning and managing finances

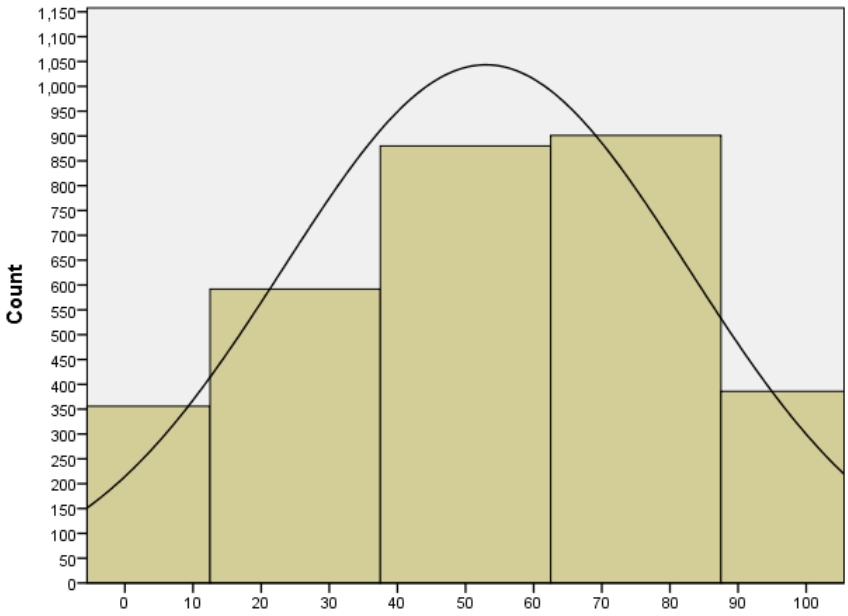


Figure 10 Distribution of percentage scores for Domain 3: Financial risk and rewards

Table 39 shows the IRT parameters for each test item. The item characteristic curves for each individual test item can be found in Appendix N. The “a” values show the discriminative properties of the test items and higher values contribute to the quality of the test. Based on

the classification described in Baker (2001), 17 test items have high to very high “a” values while 10 items have moderate “a” values and only 1 item has a low “a” value.

Table 39 IRT statistics

Item number	IRT Parameters			Domain
	a	b	c	
1	0.72	-1.75	0.17	MT
2	1.33	1.43	0.16	
3	1.27	0.05	0.17	
4	0.76	1.06	0.18	
5	1.61	0.03	0.17	
6	1.07	-0.28	0.16	
7	1.09	-0.54	0.16	
8	1.43	0.24	0.17	
9	2.40	0.65	0.15	
10	1.72	-0.37	0.16	
11	1.45	0.06	0.17	
12	1.96	0.16	0.16	PMF
13	1.26	-0.75	0.16	
14	1.80	0.24	0.15	
15	1.35	-0.52	0.15	
16	1.60	0.06	0.17	
17	1.88	-0.55	0.16	
18	0.99	1.29	0.16	
19	1.73	0.63	0.16	
20	1.81	-0.54	0.15	
21	1.40	0.30	0.17	
22	1.48	-0.15	0.16	FRR
23	0.60	0.69	0.16	
24	0.93	0.74	0.17	
25	1.10	0.07	0.16	

The “b” values are an indication of “difficulty” levels and the aim was to ensure that most test items were clustered on both sides of the standard mean difficulty of “0” and for fewer test items to be on the extreme ends of the difficulty spectrum. Table 40 shows the frequency distribution of the b parameters while Figure 11 shows the b distribution graphically. The b parameters were normally distributed with most values close to 0 and few were on the extreme ends.

Table 40 Frequency distribution of b parameters for each test question in the main study

Range	Frequency
-4.0 to -3.6	0
-3.6 to -3.2	0
-3.2 to -2.8	0
-2.8 to -2.4	0
-2.4 to -2.0	0
-2.0 to -1.6	1
-1.6 to -1.2	0
-1.2 to -0.8	0
-0.8 to -0.4	5
-0.4 to 0.0	3
0.0 to 0.4	9
0.4 to 0.8	4
0.8 to 1.2	1
1.2 to 1.6	2
1.6 to 2.0	0
2.0 to 2.4	0
2.4 to 2.8	0
2.8 to 3.2	0
3.2 to 3.6	0
3.6 to 4.0	0

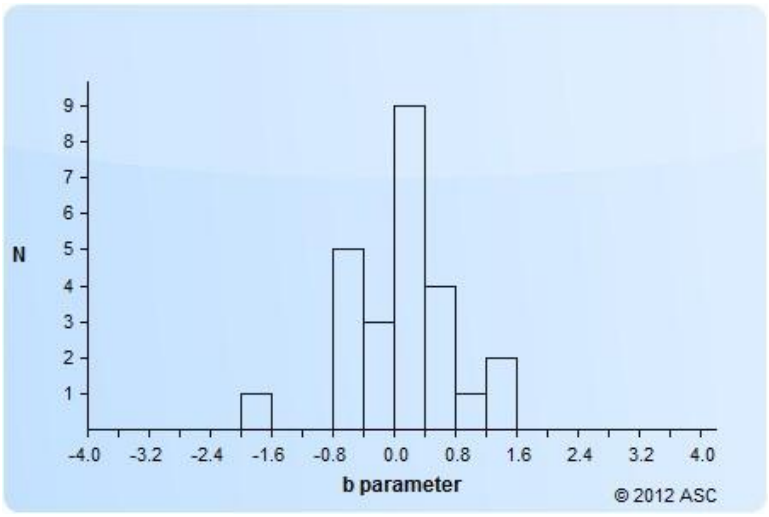


Figure 11 Distribution of b parameters

The theta estimates for each of the 3115 participants are shown in Table 41 while Figure 12 shows the distribution graphically. Theta estimates refer to the level of latent ability for each person. In this case, the latent ability refers to levels of “financial knowledge and skills”. Theta values and b values are set on the same scale. A participant whose theta value is less than the b value of a test item is less likely to be able to answer that item correctly.

Table 41 Frequency distribution of Theta estimates

Range	Frequency
Below -4	46
-4.0 to -3.6	2
-3.6 to -3.2	3
-3.2 to -2.8	12
-2.8 to -2.4	30
-2.4 to -2.0	57
-2.0 to -1.6	92
-1.6 to -1.2	155
-1.2 to -0.8	243
-0.8 to -0.4	396
-0.4 to 0.0	497
0.0 to 0.4	504
0.4 to 0.8	443
0.8 to 1.2	298
1.2 to 1.6	176
1.6 to 2.0	87
2.0 to 2.4	33
2.4 to 2.8	17
2.8 to 3.2	8
3.2 to 3.6	7
3.6 to 4.0	0
Above +4	9

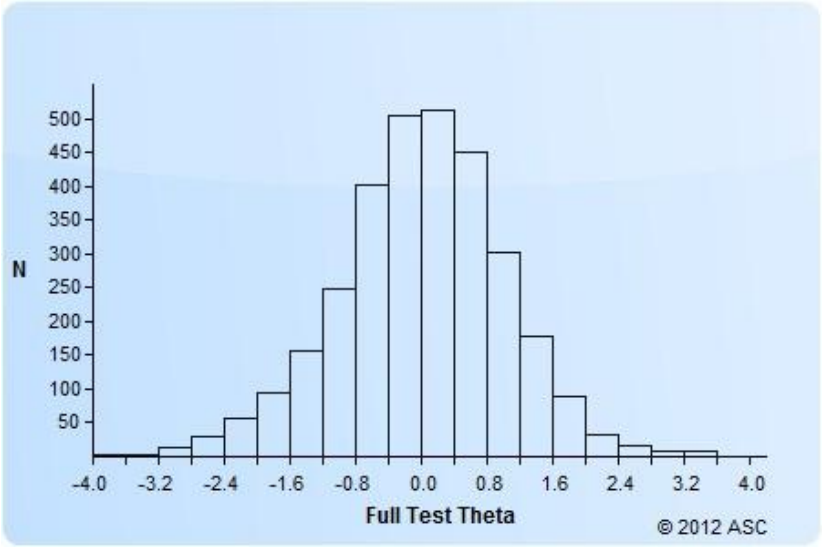


Figure 12 Theta estimates of all participants (n=3115)

6.1.2 Domain 1: Money and transactions

There were 11 test items in the MT domain and 6 of them required some basic mathematical calculations such as addition, subtraction and multiplication. Table 42 lists these items in descending order based on the percentage of respondents who gave the correct responses.

It shows the respondents' strengths and weaknesses in knowledge and skills about topics related to everyday financial transactions.

In terms of knowledge about financial products, the findings suggest that the respondents' knowledge about financial products were not necessarily constrained to those that they were familiar with. At least 57% knew about the various methods of payment and issues to do with the use of bank (ATM) cards. This could be due to many young people having their own bank account and bank cards. However, it would have been expected that many would not know what an overdraft is because under-18s are not given overdrafts. Yet, 80% knew what an overdraft is.

There was some evidence which suggests that many of them did not know how credit or credit cards work. Only about 31% knew that using a credit card is like taking out a loan where you borrow money to get something which you will pay for later. It can be argued that credit cards are not familiar to fifteen-year-olds because they are not eligible to apply for them yet. However, a counter argument is that young people should learn about what credit cards are before they turn 18 and not when they turn 18. Because by that time, it can potentially ruin their credit ratings and cause unnecessarily indebtedness if they use credit cards by assuming that it is "free money" (Money Advice Service, 2014a).

Another worrying finding was the knowledge of compound interest and the ability to calculate interest earned or owed. Although about 57% were able to calculate interest rates, even fewer (38%) were able to calculate interest earned by compounding. Whilst it is essential to have a basic understanding of simple interest, it is crucial that young people know and appreciate the power of compounding interest which is applicable to getting a car loan, mortgage and savings products.

These findings also show that when the financial situation requires retrieving the relevant information and performing calculations, many might not be able to cope. In Item 10, the task to ascertain the unit price is rather straightforward and about 67% were able to do this successfully. However, in two other scenarios (Items 8 and 4) where it was also necessary to consider some information, the proportion of correct responses fell. Young people need to be taught to be more aware about real life financial transactions which are rarely straightforward. In real life, there is often a need to seek information or even ask for it. And this is on top of calculating all the possible costs and charges. To take an example of deciding on a broadband service contract, there are line rental charges, installation charges and possibly delivery charges of the equipment needed. On top of comparing costs between different providers, there are also other considerations such as quality of customer service and after-sales care.

Table 42 Percentage of correct responses in the MT domain

Money and transactions		
Item number	Test objective	Percentage who gave correct responses
1	Know about using overdrafts.	80.0
7	Have a basic understanding of the use of ATM cards.	67.7
10	Able to calculate the unit prices of products (or use other strategies) to compare prices.	66.9
6	Understand how bank charges are likely to be incurred.	62.7
3	Able to convert between different currencies given the exchange rates.	57.1
5	Able to calculate interest rates.	57.0
11	Know about various methods of payment.	57.0
8	Able to calculate the total amount payable in a purchase transaction.	52.8
4	Able to calculate prices of possible purchases.	44.1
9	Able to calculate interest earned given the beginning balance and annual interest rate.	38.1
2	Understand the nature of a transaction involving a credit card.	30.8

6.1.3 Domain 2: Planning and managing transactions

There were 10 test items in the PMF Domain. Table 43 lists these items in descending order based on the percentage of participants who gave the correct responses. The topics in the PMF domain reflect knowledge about different ways in which income is earned and measured; budgeting matters and planning of saving and expenditures. Majority were able to answer eight out of ten questions in this domain correctly.

The results show that most of the respondents had some basic knowledge and skills to deal with matters related to salary, budgeting and various decisions surrounding expenses. These results suggest that most of them can cope with making rational financial decisions related to work and everyday living, such as budgeting and living within one's means.

The weaker results for items 19 and 18 suggest that amongst the respondents, there could be a low level of knowledge and understanding about the impact of compound interest on debts and savings.

Table 43 Percentage of correct answers in the PMF domain

Planning and managing finances		
Item number	Test objective	Percentage who gave correct responses
13	Able to understand parts of a payslip.	73.0
17	Able to examine one's budget to plan for a future expense.	71.6
20	Know what taxes are used for.	70.7
15	Able to make sound decisions to balance a budget.	68.5
16	Able to make sound choices that are likely to increase one's savings.	56.5
12	Able to calculate income earned.	53.1
21	Understand that expenditures are sometimes necessary to bring in future benefit.	51.0
14	Understand that income earned may be fixed or variable depending on the terms of employment.	50.4
19	Able to understand the impact of compound interest on debts like those held on credit cards.	42.1
18	Able to understand the impact of compound interest on savings in bank accounts.	36.0

6.1.4 Domain 3: Financial risk and rewards

There were 4 test items in the FRR Domain. Table 44 lists these items in descending order based on the percentage of respondents who gave the correct responses. The number of items tested in this domain was deliberately made smaller compared to the number of items in the other domains. This was to avoid giving business studies students an unfair advantage. Also, as explained in Chapter three, it was of the experts' opinion that topics in the MT and PMF subscales were more relevant to young people. Hence, care must be taken not to make

sweeping assumptions about young people's knowledge about financial risk and reward, based on the findings in this study. Nevertheless, the findings can help us gain some idea about the extent of young people's knowledge about financial risk and rewards.

The findings suggest that more than half of the respondents knew what inflation is and how risky actions might affect insurance premiums. Less than half had some knowledge about financial investments and their relative risks. These results were unsurprising because most fifteen-year-olds would not have been involved in family financial decisions involving insurance and financial investments. These topics could be more familiar to those whose from wealthier families (Financial Services Authority, 2000a) or to those who were business studies students (Ofsted, 2011).

Regardless, for all young people, the topics of insurance and financial investments are likely to be pertinent to them in the near future, so these topics should be included in the financial education curriculum so that at the very least, young people have a basic knowledge and understanding about financial investments as these have huge implications when it comes to pension planning in adulthood.

Table 44 Percentage of correct answers in the FRR domain

Financial risk and reward		
Item number	Test objective	Percentage who gave correct responses
22	Know what inflation is.	60.9
25	Understand that actions which increase risk are likely to increase the insurance policy premiums one has to pay.	55.9
23	Understand what a shareholder is entitled to as a result of making a financial investment.	49.6
24	Know about the relative risks of basic financial products such as foreign currencies, shares, bonds and savings products.	45.5

The findings about the levels of financial education and skills of the young people in this sample have highlighted specific topics that many young people in the UK might struggle with. Previous surveys conducted with young people aged 15 to 24 had indicated that they did not feel that they had adequate financial knowledge (Financial Services Authority, 2004c ; Financial Services Authority, 2004d; ifs University College, 2014). However, there was not much research evidence which showed what aspects of personal finance that they already knew.

This study has highlighted that many young people lacked the knowledge about compound interest; the skills to calculate compound interest and the ability to manage complex financial decisions. These findings support some previous survey findings which had found that many young people knew what a debit card was but not the function of a credit card (Personal Finance Education Group, 2010b) and that many were found to have a low understanding of credit and interest rates (Clarke, 2013).

Due to a lack of UK based studies, efforts were made to compare the findings of this study with other studies based outside the UK. Unfortunately, many of the studies based outside

of the UK are incomparable for many reasons. Firstly, most of these studies had assessed very specific knowledge related to economics and business subjects. Secondly, their samples of young people were usually university students and this might not be a good representation of the under-18s. Lastly, the questions asked were not the same and making comparisons could result in inaccurate claims.

Nevertheless, this study has highlighted the strengths and weaknesses of young people's financial knowledge and skills which will be useful for intervention and policy making.

6.1.5 Correlates of financial knowledge and skills

The previous sections 6.1.1 to 6.1.4 described the levels of financial knowledge and skills that the fifteen-year-olds in the sample had. In this section, the aim was to examine how the mean scores differed between relationships various subgroups. In this study, three sets of independent variables were measured. The first set consisted of personal characteristics (gender, ethnicity and financial behavior type). The second set consisted of educational variables (business study enrolment; Year 9 English and Mathematics levels). The third set consisted of family related variables (family income and parents' education).

The analyses that follow will answer the following research questions:

> *Which independent variables were significantly correlated with financial knowledge and skills and what was the extent of these relationships, if there were any?*

Firstly, an overview of the differences in means by subgroups, as well as their significance, if any is presented in Table 45. The actual mean scores and standard deviations can be found in Appendix R.

Table 45 Differences in mean percentage test scores by background variables (whole sample)

	Financial knowledge and skills test (%)	Money and Transactions (%)	Planning and managing finances (%)	Financial risk and rewards (%)
Gender				
Male vs. Female	-1.46	-2.12*	-1.33	.03
Ethnicity				
White vs. Mixed	-3.15*	-2.36	-2.83	-6.08**
White vs. Asian	-.16	.44	-.76	-.28
White vs. Black	-3.42**	-2.26	-4.05**	-5.00**
White vs. Other	-5.40**	-2.93	-7.50**	-6.95**
Financial Behaviour Type				
Saver vs. Spender	-6.65***	-6.19***	-7.53***	-5.69**
Saver vs. Mixed Saver/Spender	-1.11	-1.57	-.80	-.60
Saver vs. Entrepreneur	-.10	.67	-.52	-1.20
Business Studies Student				
No vs. Yes	1.77*	1.10	2.40*	2.05
English level				
Level 8 vs. Level 1 to 4	-26.98***	-26.86***	-28.95***	-22.37***
Level 8 vs. Level 5	-20.71***	-20.74***	-22.67***	-15.72***
Level 8 vs. Level 6	-11.39***	-11.36***	-12.22***	-9.41***
Level 8 vs. Level 7	-3.24*	-3.05	-3.50	-3.14
Maths Level				
Level 8 vs. Level 1 to 4	-33.42***	-35.75***	-34.36***	-24.67***
Level 8 vs. Level 5	-27.07***	-30.60***	-27.65***	-15.90***
Level 8 vs. Level 6	-18.16***	-19.41***	-18.27***	-14.48***
Level 8 vs. Level 7	-7.14***	-8.60***	-6.38***	-4.99*
Receives free school meals				
No vs. Yes	-6.84***	-6.40***	-7.63***	-6.11***
Number of books				
more than 100 vs. 0 to 20	-12.27***	-12.25***	-13.68***	-8.79***
more than 100 vs. 21 to 50	-7.25***	-7.23***	-8.75***	-3.53*
more than 100 vs. 51 to 100	-3.81***	-4.40***	-4.22***	-1.14
Highest education level of one parent				
University vs lower than A levels	-4.62***	-5.47***	-4.43**	-2.77
University vs A levels	-.83	-.80	-.88	-.76

*p<.05, **p<.01, ***p<.001

The differences in mean scores between the subgroups suggest some associative patterns in the data. In terms of personal characteristics, those who were males, White and identified with being “Savers” were likely to have higher test scores. In terms of educational variables, those who were business studies students, as well as those who were more literate and numerate were also likely to have higher test scores. In terms of family background, those who came from wealthier families and had more educated parents, were also associated with higher test scores.

The significance of the differences in means is also reflected in Table 46. Findings which were found to be significant indicate that the differences were unlikely to happen by chance. For instance, it was found that in the MT domain, females were likely to score 2% lower than males and this finding was significant (at $P<.05$). The association of test scores to English levels, Mathematics levels and family wealth (as indicated by FSM and number of books) were highly significant.

Next, multivariate analyses were carried out to identify the key correlates of financial knowledge and skills. Unlike bivariate test of differences in means, multivariate models can estimate how much change in the dependent variable can be attributed exclusively to each independent variable. A sample of 1142 complete cases was extracted from the main sample. There were no missing data within this partial sample, making it suitable for making multiple linear regression models. There are different statistical treatments for missing values but excluding incomplete sets of data for multivariate analyses is a reasonable decision when conducting multivariate analyses, provided the sample is large enough (Field, 2009; Tabachnick and Fidell, 2013).

Tables 46 and 47 show how this sample compares with the main sample as well as with the 2011 population census of England, Oxford and London. In terms of gender, the sample is similar to the main study sample and in terms of ethnicity, it is similar to the main study sample as well as that of London's.

Table 46 Comparison of sample (n=1142) by gender

	Fifteen-year-olds (England)		Fifteen-year-olds (Oxford)		Fifteen-year-olds (London)		Fifteen-year-olds (main study sample, n=2798)		Fifteen-year-olds (main study sample, n=1142)	
Gender	count	%	count	%	count	%	count	%	count	%
Males	333,223	51.2	705	50.0	48615	51.9	945	33.8	377	33
Females	317,603	48.8	705	50.0	44984	48.1	1853	66.2	765	67

Table 47 Comparison of sample (n=1142) by ethnicity

	Fifteen-year-olds (England)		Fifteen-year-olds (Oxford)		Fifteen-year-olds (London)		Fifteen-year-olds (main study sample, n=2892)		Fifteen-year-olds (main study sample, n=1142)	
Ethnicity	count	%	count	%	count	%	count	%	count	%
White	530799	81.6	988	70.1	44622	47.7	1273	44.0	508	44.5
Mixed	26290	4.0	105	7.4	8010	8.6	259	9.0	98	8.6
Asian	57283	8.8	226	16.0	18572	19.8	712	24.6	255	22.3
Black	29693	4.6	72	5.1	18630	19.9	511	17.7	212	18.6
Other	6761	1.0	19	1.3	3765	4.0	137	4.7	69	6.0

The partial sample was also checked for assumptions of no perfect multicollinearity, homoscedasticity and normally distributed errors (Field, 2009).

To check if multicollinearity exists, the VIF (variance inflation factor) and tolerance statistics were examined. It was found that the largest VIF for each model was about 2 and according to Bowerman and O'Connell (1990), the largest VIF should not be greater than 10. Also, the average VIF for each model was close to 1 and the tolerance values were all above .2. All this indicates that multicollinearity was unlikely to exist (Bowerman and O'Connell, 1990; Menard, 1995).

For each regression model, plots of standardised residuals against standardised independent variables were checked and shown in Appendix P. Each plot shows that the points were randomly and evenly scattered throughout. This indicates that the assumptions of linearity and homoscedasticity were met.

As shown in Appendix P, the histogram and normal P-P plots of the residuals for each regression model appears to be normally distributed.

Table 48 shows the mean percentage scores of the partial sample (n=1142) by the subgroups as well as their standard deviation values. The associative patterns found between the mean scores and subgroups were similar to that of the whole sample (Table 45). The only difference is that in the partial sample, the mean scores for the "Entrepreneurs" were higher than the "Savers" but this should not have a material impact on the findings. Table 49 presents the bivariate tests for differences in means while Table 50 presents the multiple linear regression models of the partial sample (n=1142).

Table 48 Mean percentage test scores by independent variables (partial sample, n=1142)

	n	Financial knowledge and skills test (%)	SD	Money and Transactions (%)	SD	Planning and managing finances (%)	SD	Financial risk and rewards (%)	SD
Gender									
Male	377	64.49	19.85	64.07	21.79	66.61	24.35	60.35	29.72
Females	765	59.23	18.72	58.81	21.34	60.84	23.24	56.34	28.12
Ethnicity									
White	508	63.45	19.32	61.95	21.81	66.24	23.31	60.58	27.42
Mixed	98	60.37	20.59	60.67	22.45	62.55	24.25	54.08	30.61
Asian	255	60.53	18.47	61.07	20.44	60.47	24.47	59.22	27.14
Black	212	57.49	18.63	57.50	22.38	59.48	22.23	52.48	31.12
Other	69	55.77	19.17	57.44	20.30	55.65	24.70	51.45	30.28
Financial Behaviour Type									
Saver	306	62.18	18.90	61.79	21.81	63.79	23.64	59.23	28.10
Spender	106	56.49	19.29	56.09	21.60	57.93	23.10	54.00	30.11
Mixed Saver/Spender	646	60.72	19.08	60.17	21.29	62.65	23.89	57.39	28.61
Entrepreneur	84	64.05	20.97	64.50	22.83	65.71	23.56	58.63	29.93
Business Studies student									
No	795	60.61	19.36	60.57	21.50	61.87	24.16	57.55	28.63
Yes	347	61.78	19.01	60.49	21.94	64.73	22.70	57.93	28.93
English level									
Level 1 to 4	43	38.70	18.16	38.48	22.25	36.05	20.25	45.93	30.83
Level 5	152	48.61	18.42	49.04	20.35	49.28	23.25	45.73	28.60
Level 6	429	58.14	17.78	57.60	20.48	59.79	23.05	55.48	29.34
Level 7	382	68.20	16.17	67.42	19.49	70.92	20.26	63.55	25.83
Level 8	136	70.41	17.79	70.39	19.26	72.57	21.15	65.07	27.77
Maths Level									
Level 1 to 4	59	38.17	16.35	36.37	18.80	38.14	19.07	43.22	30.38
Level 5	151	45.54	16.03	44.43	18.20	45.23	22.41	49.34	29.99
Level 6	353	56.48	16.09	55.78	19.72	58.75	20.62	52.69	27.95
Level 7	349	67.42	15.94	66.61	17.88	70.20	20.95	62.68	26.58
Level 8	230	74.03	16.42	75.46	17.44	75.35	21.04	66.85	27.37
Receives free school meals									
No	1020	61.89	18.89	61.29	21.30	63.80	23.46	58.77	28.41
Yes	122	53.18	20.54	54.32	23.36	53.85	24.44	48.36	29.59
Number of books									
0 to 20	137	53.93	19.55	54.48	21.65	54.53	23.98	50.91	31.27
21 to 50	234	57.40	19.07	57.42	21.87	58.21	24.66	55.34	29.27
51 to 100	291	59.95	18.90	59.39	22.42	61.31	22.98	58.08	28.30
more than 100	480	65.33	18.47	64.51	20.30	68.17	22.48	60.47	27.58
Highest parents' education									
Lower than A levels	220	57.95	19.58	57.15	22.07	59.68	24.15	55.80	27.92
A Levels	234	60.05	18.56	59.75	21.22	61.50	23.49	57.27	28.94
University education	688	62.24	19.28	61.91	21.52	64.14	23.63	58.40	28.89

Table 49 Differences in mean percentage test scores by background variables (n=1142)

	Financial knowledge and skills test (%)	Money and Transactions (%)	Planning and managing finances (%)	Financial risk and rewards (%)
Gender				
Male vs. Female	-5.26***	-5.26***	-5.77***	-4.00*
Ethnicity				
White vs. Mixed	-3.08	-1.29	-3.69	-6.50
White vs. Asian	-2.92	-.89	-5.77	-1.37
White vs. Black	-5.96**	-4.45	-6.76	-8.10**
White vs. Other	-7.68*	-4.51	-10.59	-9.13
Financial Behaviour Type				
Saver vs. Spender	-5.69	-5.71	-5.87	-5.22
Saver vs. Mixed Saver/Spender	-1.46	-1.62	-1.14	-1.84
Saver vs. Entrepreneur	1.86	2.71	1.92	-.60
Business Studies Student				
No vs. Yes	1.17	-.08	2.85	.38
English level				
Level 8 vs. Level 1 to 4	-31.71***	-31.91***	-36.53***	-19.14**
Level 8 vs. Level 5	-21.81***	-21.34***	-23.30***	-19.35***
Level 8 vs. Level 6	-12.28***	-12.79***	-12.78***	-9.60**
Level 8 vs. Level 7	-2.21	-2.97	-1.66	-1.53
Maths Level				
Level 8 vs. Level 1 to 4	-35.87***	-39.09***	-37.21***	-23.63***
Level 8 vs. Level 5	-28.50***	-31.02***	-30.12***	-17.51***
Level 8 vs. Level 6	-17.56***	-19.67***	-16.59***	-14.16***
Level 8 vs. Level 7	-6.62***	-8.85***	-5.15*	-4.17
Receives free school meals				
No vs. Yes	-8.71***	-6.97**	-9.95***	-10.41***
Number of books				
more than 100 vs. 0 to 20	-11.40***	-10.03***	-13.64***	-9.56**
more than 100 vs. 21 to 50	-7.92***	-7.09***	-9.96***	-5.13
more than 100 vs. 51 to 100	-5.38**	-5.12**	-6.86***	-2.39
Highest education level of one parent				
University vs lower than A levels	-4.29*	-4.76*	-4.46*	-2.60
University vs A levels	-2.19	-2.15	-2.65	-1.13

**p<.05, **p<.01, ***p<.001*

Table 50 Multiple linear regression models for test scores (n=1142)

	Financial knowledge and skills test (%)		Money and Transactions (%)		Planning and managing finances (%)		Financial risk and rewards (%)	
Variable	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*
Intercept	79.81***	(1.92)	79.31***	(2.25)	82.87***	(2.49)	73.53***	(3.37)
Male vs Female	-3.12**	(1.05)	-2.67*	(1.23)	-3.57**	(1.37)	-3.21	(1.85)
White vs mixed	-2.53	(1.76)	-.43	(2.06)	-3.56	(2.29)	-5.72	(3.10)
White vs Asian	-3.23*	(1.26)	-1.22	(1.47)	-6.06***	(1.63)	-1.69	(2.21)
White vs Black	-5.47***	(1.37)	-3.72*	(1.61)	-6.57***	(1.78)	-7.55**	(2.42)
White vs Others	-5.07*	(2.04)	-1.89	(2.40)	-7.85**	(2.66)	-6.87	(3.60)
Saver vs Spender	-4.16*	(1.79)	-3.62	(2.10)	-4.79*	(2.33)	-4.09	(3.15)
Saver vs Mixed Saver/Spender	-.56	(1.11)	-.49	(1.29)	-.52	(1.44)	-.82	(1.94)
Saver vs Entrepreneur	2.53	(1.96)	3.09	(2.30)	2.60	(2.55)	.80	(3.45)
business studies (no vs yes)	.84	(1.05)	-.65	(1.23)	2.76*	(1.36)	.13	(1.84)
English level 8 vs level 1 to 4	-10.74**	(3.35)	-7.31	(3.92)	-15.53***	(4.35)	-8.18	(5.89)
English level 8 vs level 5	-7.07**	(2.18)	-3.75	(2.56)	-8.74**	(2.83)	-11.99**	(3.84)
English level 8 vs level 6	-3.46	(1.76)	-1.91	(2.06)	-4.50*	(2.29)	-5.08	(3.10)
English level 8 vs level 7	.94	(1.63)	1.40	(1.91)	.86	(2.12)	-.12	(2.87)
Maths level 8 vs level 1 to 4	-26.84***	(2.86)	-33.21***	(3.36)	-24.94***	(3.72)	-14.09**	(5.04)
Maths level 8 vs level 5	-21.97***	(1.97)	-26.70***	(2.31)	-21.97***	(2.56)	-9.00*	(3.47)
Maths level 8 vs level 6	-13.20***	(1.56)	-16.82***	(1.83)	-11.19***	(2.02)	-8.26**	(2.74)
Maths level 8 vs level 7	-5.41***	(1.41)	-8.10***	(1.65)	-3.72*	(1.83)	-2.23	(2.48)
free school meals (no vs yes)	-3.72*	(1.57)	-2.26	(1.83)	-4.32*	(2.03)	-6.23*	(2.75)
more than 100 books vs 0 to 20 books	-3.31*	(1.63)	-2.15	(1.91)	-4.71*	(2.12)	-2.99	(2.87)
more than 100 books vs 21 to 50 books	-2.04	(1.32)	-1.32	(1.54)	-3.34	(1.71)	-.76	(2.32)
more than 100 books vs 51 to 100 books	-2.66*	(1.20)	-2.56	(1.41)	-3.80*	(1.56)	-.07	(2.12)
University vs lower than A levels	.15	(1.30)	-.05	(1.52)	.36	(1.68)	.17	(2.28)
University vs A levels	-.14	(1.25)	.48	(1.47)	-.65	(1.63)	-.56	(2.21)
R^2	.35		.28		.28		.10	

**p<.05, **p<.01, ***p<.001*

Based on the results from the bivariate and multivariate tests shown in Tables 49 and 50, it was inferred that gender, ethnicity, financial behaviour type, English and Mathematics levels were very likely to be highly associated with financial knowledge and skills. Even after holding the other independent variables constant, females had significantly lower levels of financial knowledge and skills than their male counterparts. Females were likely to score about 3% less than males on the whole test, about 2.7% less on the MT domain and about 3.6% less on the PMF domain. Asians and "Others" were likely to score 3% to 6% lower than Whites on the whole test and on the PMF domain. Black students were found to have significantly lower scores than White students on the whole test as well as in all of the domains. "Spenders" still had significantly lower scores on the overall test as well as the PMF domain even after controlling for the other independent variables.

English and Mathematics levels were still significantly associated with financial knowledge and skills even after controlling for the other independent variables. In fact, Mathematics levels were much more closely associated with the test scores than English levels. Those who attained a level 8 in English were likely to have scored about 11% more on the whole test compared to those who attained levels 1 to 4 in English. Those who attained a level 8 in Mathematics were likely to have scored about 27% more on the whole test compared to those who attained levels 1 to 4 in Mathematics.

Being a business studies student was not found to be closely associated with financial knowledge and skills. There was some significant association with the PMF domain but there was no significant association with the overall test scores.

While the bivariate tests show that family wealth and parents' education were found to be significant and positively correlated to the test scores, the results reflected by the

multivariate models suggest that the correlation was rather weak. This indicates that family wealth and parents' education were not likely to be highly associated with financial knowledge and skills.

6.2 Financial attitudes

The other key aspect of financial literacy examined was financial attitudes. These were assessed using likert-type statements (Table 51). For each statement, participants were asked to select one out of five options varying from strongly disagree to strongly agree. Attitude statements 1, 4, 6 and 7 were positively phrased statements. Participants who agreed more with these statements would receive a higher score. Attitude statements 2, 3 and 5 were negatively phrased. Participants who disagreed more with these statements would receive a higher score. Table 52 shows how the scores were allocated.

Table 51 Attitude statements

Type	Attitude statements
Positive	1. Knowing how to manage money is important to me.
Negative	2. Money is there to be spent.
Negative	3. I should start saving money only when I have a paying job
Positive	4. I would rather earn my own money than to ask my parents for money.
Negative	5. I am comfortable about owing someone money.
Positive	6. I like to compare prices.
Positive	7. I am confident of managing my own money.

Table 52 Scores for attitude statements

	Response categories and scores				
	Strongly agree ☺☺	Agree ☺	Neither agree nor disagree 😐	Disagree ☹	Strongly disagree ☹☹
Positively phrased statements	5	4	3	2	1
Negatively phrased statements	1	2	3	4	5

6.2.1 Overall findings

This section answers the following research question:

> *Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what levels of desired financial attitudes were found in them based on the results of the financial attitudes survey?*

Table 53 shows the distribution of participants' choices for each statement and Table 54 shows the overall mean scores obtained for each statement. The results in Table 53 are represented graphically in Figures 13 to 19.

Table 53 Distribution of responses to the attitude statements

	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)
Knowing how to manage money is important to me.	48.7	40.4	9.3	.9	.7
Money is there to be spent	29.2	9.1	44.3	2.4	15.0
I should start saving money only when I have a paying job.	11.7	21.0	20.0	36.7	10.5
I would rather earn my own money than to ask my parents for money.	31.6	36.7	21.9	6.7	3.0
I am comfortable about owing someone money.	7.4	18.7	19.0	29.4	25.4
I like to compare prices.	24.8	42.0	22.8	7.9	2.4
I am confident of managing my own money.	28.8	45.0	19.0	5.5	1.6

Table 54 Mean scores for the attitude statements

	N	Mean	Standard Deviation	Median	Skewness	Kurtosis
Knowing how to manage money is important to me.	3084	4.35	0.74	4	-1.22	2.16
Money is there to be spent.	3076	2.73	0.91	3	0.04	-0.17
I should start saving money only when I have a paying job.	3079	3.13	1.20	3	-0.30	-0.97
I would rather earn my own money than to ask my parents for money.	3077	3.88	1.03	4	-0.78	0.14
I am comfortable about owing someone money.	3074	3.47	1.26	4	-0.38	-0.97
I like to compare prices.	3076	3.79	0.98	4	-0.69	0.12
I am confident of managing my own money.	3080	3.94	0.92	4	-0.81	0.54

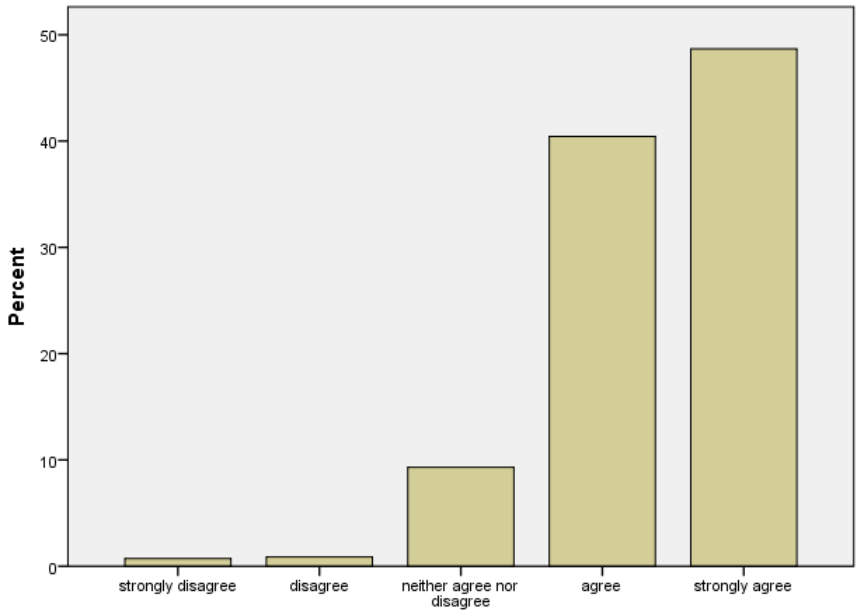


Figure 13 Distribution of responses to the statement "Knowing how to manage money is important to me".

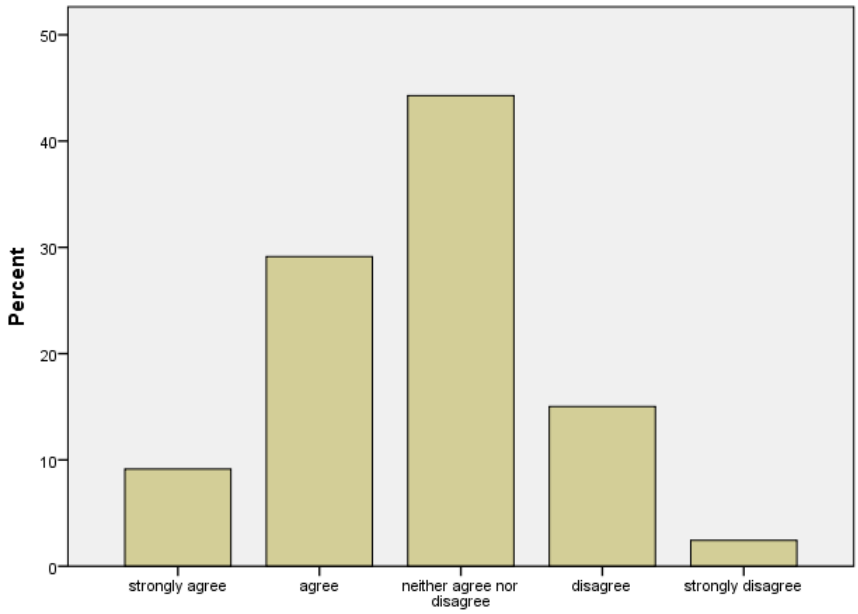


Figure 14 Distribution of responses to the statement "Money is there to be spent".

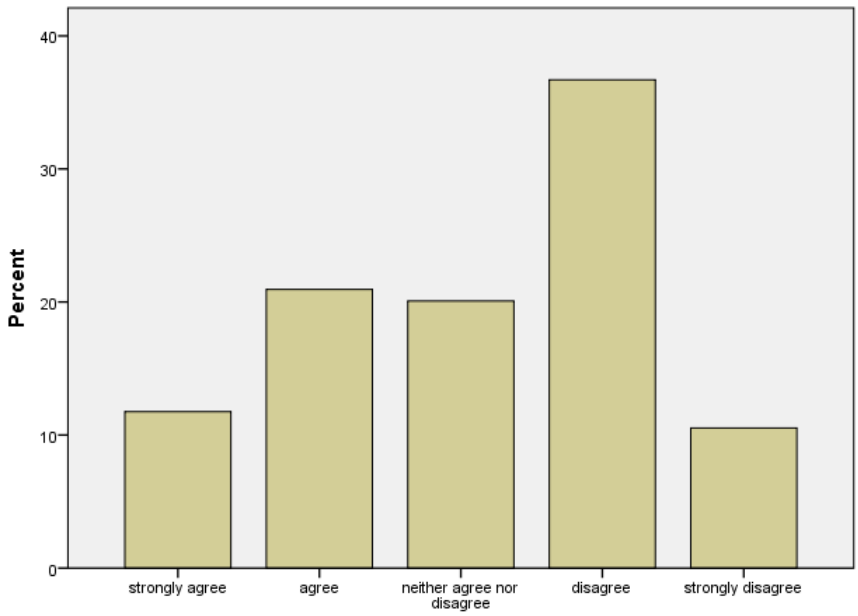


Figure 15 Distribution of responses to the statement "I should start saving money only when I have a paying job".

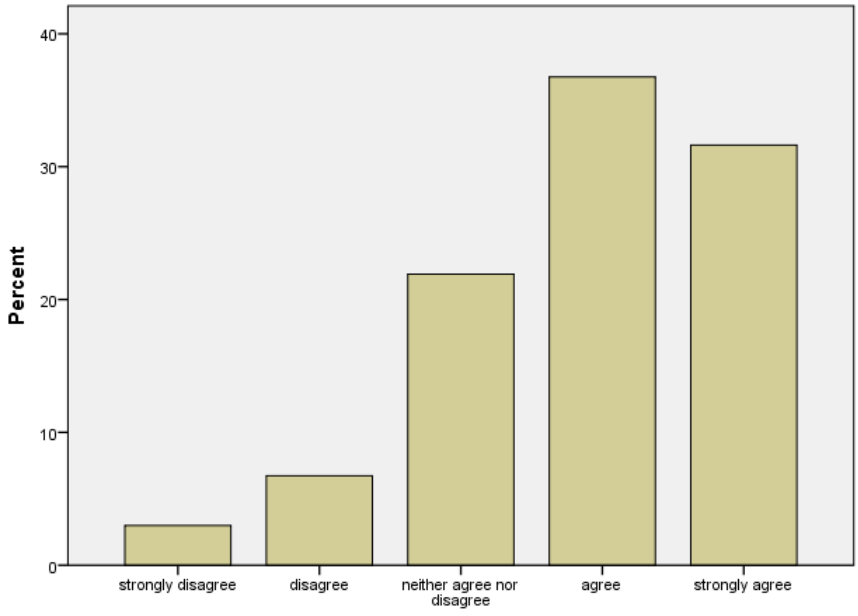


Figure 16 Distribution of responses to the statement "I would rather earn my own money than to ask my parents for money".

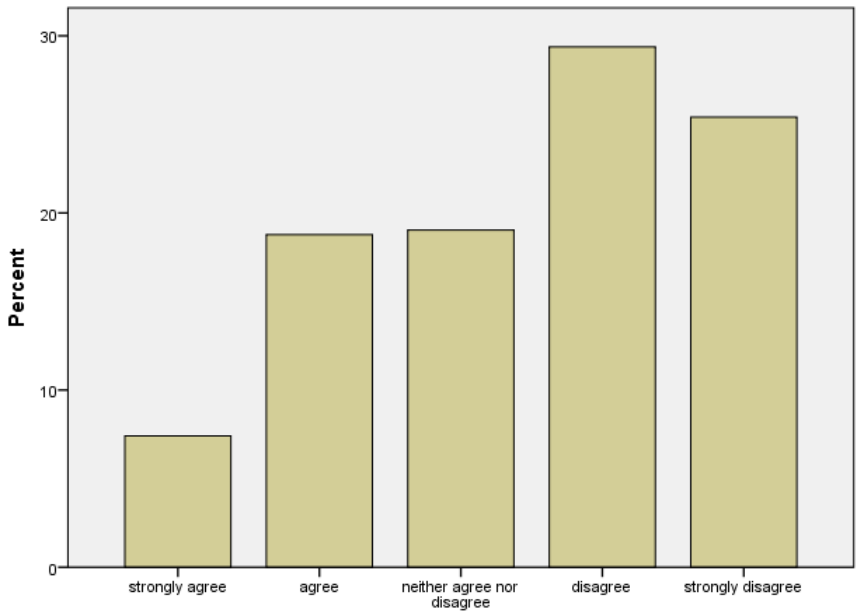


Figure 17 Distribution of responses to the statement "I am comfortable about owing someone money".

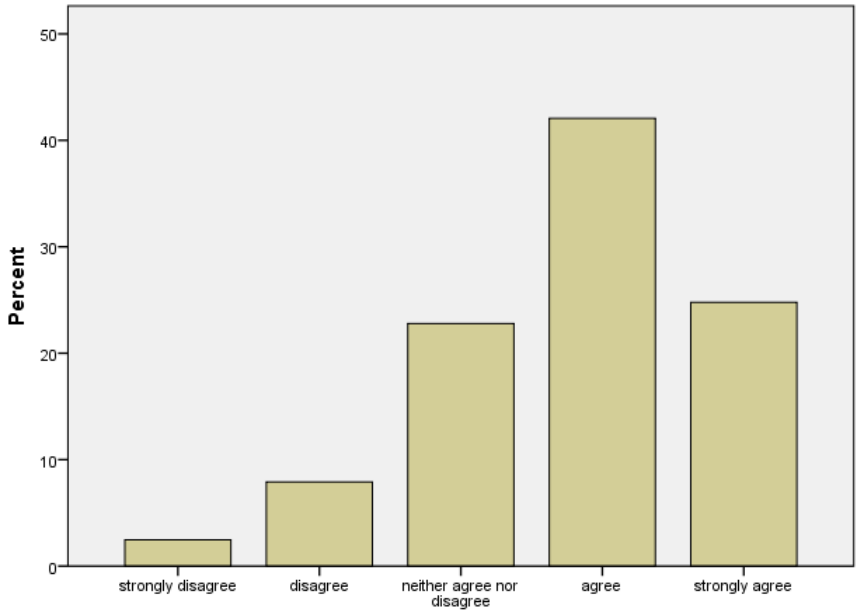


Figure 18 Distribution of responses to the statement "I like to compare prices".

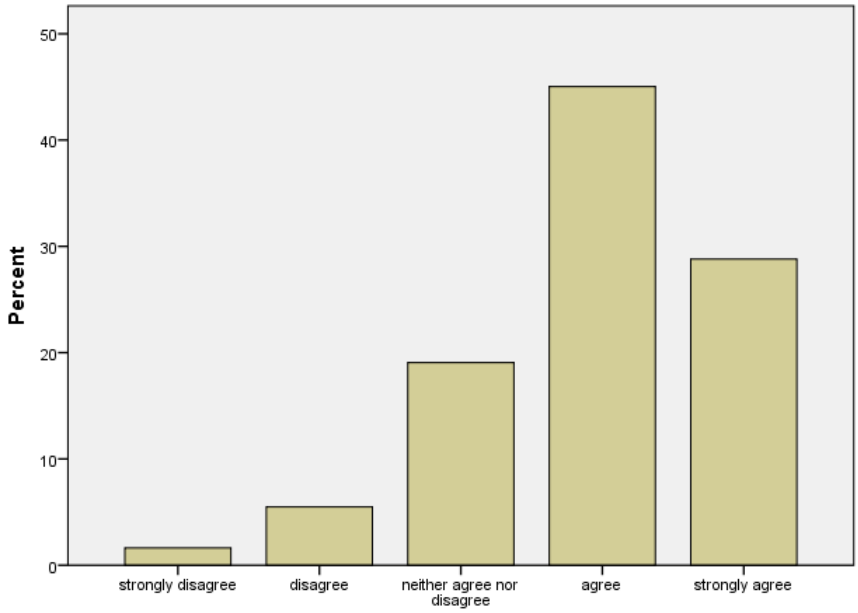


Figure 19 Distribution of responses to the statement "I am confident of managing my own money".

A comparison of the mean scores shows that the respondents had more desired attitudes towards the importance of being financially literate and being confident about managing their own money. The majority of them also expressed a high inclination to compare prices and to want to be financially independent. Their attitudes about spending and saving were less desirable. The proportion of those who were likely to spend their money quickly was higher than the proportion of those who were likely to save some of it. This and the fact that the mean scores for levels of desired attitudes towards spending, saving and borrowing were the lowest of the seven attitudes measured suggest that the respondents' attitudes in these areas were less desirable.

6.2.2 Factor analysis

An exploratory factor analysis, using orthogonal rotation was carried out on the seven financial attitudes. This was done to check whether all the attitudes reflected a single attitudes index or whether there were clusters of attitudes. The Kaiser-Meyer-Olkin measure, which was .62, verified the sampling size for analysis. According to Field (2009), this was above the acceptable limit of .5. Bartlett's test of sphericity X^2 (21) = 261.52, p<.001, which indicated that the correlations between items were sufficiently large for a principal component analysis. An initial analysis was run to obtain eigenvalues for each component in the data. Two components had eigenvalues over Kaiser's criterion of 1 and together, they explained 41.79% of the variance. The scree plot in Figure 20 also suggests there were two components. Therefore, two components were retained for analysis. Table 55 shows the factor loadings after rotation.

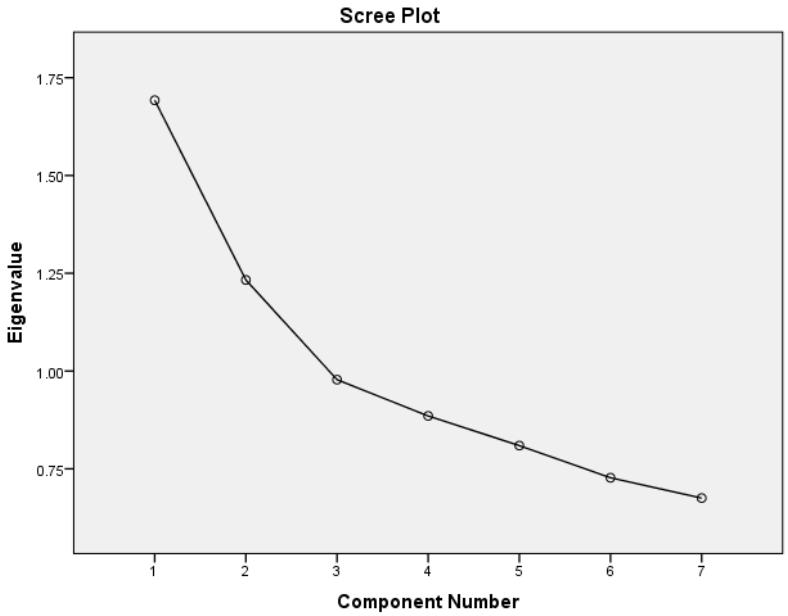


Figure 20 Scree plot for factor analysis of financial attitudes

Table 55 Summary of exploratory factor analysis results for the attitude statements

	Rotated factor loadings	
Statement	Factor 1	Factor 2
Knowing how to manage money is important to me.	.69	
I like to compare prices.	.68	
I am confident of managing my own money.	.61	
I would rather earn my own money than to ask my parents for money.	.50	
I should start saving money only when I have a paying job.		.70
Money is there to be spent.		.69
I am comfortable about owing someone money.		.57

The attitude statements under Factor 1 consist of key words such as “manage”, “compare”, “earn”. This suggests that Factor 1 can be labelled as “Managing money” attitudes.

The attitude statements under Factor 2 consist of key words such as “saving”, “spent”, “owing”. This suggests that Factor 2 can be labelled as “Spending money” attitudes.

Given that two factors were found, the correlates for the 7 attitudes as well as for these two factors were examined and will be presented in the next section.

6.2.3 Correlates of financial attitudes

Previously, sections 6.2.1 and 6.2.2 described the levels of desired financial attitudes found in this sample of fifteen-year-olds. In this section, the aim was to determine which of the independent variables might be significant correlates of financial attitudes. The same independent variables used for examining the correlates of financial knowledge and skills were used.

The analyses that follow will answer the following research questions:

> *Which independent variables were significantly correlated with financial attitudes and what was the extent of these relationships, if there were any?*

Firstly, an overview of the differences in means by subgroups, as well as their significance, if any is presented in Table 56. The actual mean scores and standard deviations can be found in Appendix S. The differences in means were quite small because attitudes were measured on a 5 point scale.

By focusing only on the significant findings in Table 56, some preliminary observations about the likely correlates of financial attitudes were made. Unlike the patterns found in the personal finance test scores, it did not seem that the individual attitudes or clusters of attitudes shared many common correlates. In fact, some of the patterns contradict the patterns found in the previous section where the correlates of financial knowledge and skills were examined. Females were likely to have less desired “Managing money” attitudes than males but more desired “Spending money” attitudes than males. For example, females were less likely to feel that knowing how to manage money is important, as compared to males, by about .18 points lower. However, females were less likely than males to spend their money quickly.

In terms of differences in scores by ethnicity, it seemed that those who were non-white (Mixed, Asians, Blacks, “Others”), had significantly more positive “Managing money” attitudes than those who were White. Non-white participants were more likely to feel that being financially literate is important. They were also more likely to compare prices and feel more confident about managing their money, as compared to White participants.

In terms of financial behavior types, those who identified themselves as either “Spenders” or “Mixed Saver/Spenders” were likely to have lower levels of desired attitudes compared to “Savers”. Business studies students were more likely to have higher levels of desired attitudes than non-business studies students in terms of “Managing money” attitudes; they were more likely to want to become financially literate, compare prices and were more confident about managing their money.

There were some positive associations between English levels and “Spending money” attitudes while Mathematics levels were associated with most attitudes. Higher levels of English or Mathematics levels appeared to be positively associated with having higher levels of desired attitudes.

There were some positive association between family wealth (measured by number of books) and desired levels of some attitudes. Those from wealthier families were more likely to have higher levels of desirable attitudes, especially in terms of saving money and comparing prices.

There were some positive association between parents’ education and levels of desirable attitudes. Those whose parents had university education were more likely to have higher levels of desirable attitudes in terms of wanting to become financially literate, saving money and comparing prices.

Table 56 Bivariate tests for attitude scores (whole sample)

	Importance of personal finance	Attitude towards spending	Attitude towards saving	Attitude towards financial independence	Attitude towards debt	Attitude towards price comparison	Confidence in managing money	Factor 1: Managing money attitudes	Factor 2: Spending money attitudes
Gender									
Male vs. Female	-.18***	.15***	.02	-.11**	.23***	-.07	-.40***	-.75***	.40
Ethnicity									
White vs. Mixed	.09	-.06	.15	-.07	.08	.03	.25***	.29	.15
White vs. Asian	.26***	-.05	-.10	.14**	-.05	.16***	.16***	.72***	-.21
White vs. Black	.22***	-.09	.03	.03	.29***	.33***	.17***	.75***	.24
White vs. Other	.25***	-.11	-.22*	.23*	.17	.13	.17*	.77**	-.14
Financial Behaviour Type									
Saver vs. Spender	-.65***	-1.03***	-.82***	-.54***	-.14	-.50***	-.56***	-2.25***	-1.99***
Saver vs. Mixed Saver/Spender	-.26***	-.28***	-.40***	-.25***	.02	-.20***	-.30***	-1.00***	-.65***
Saver vs. Entrepreneur	.09	-.25***	-.28**	-.07	-.02	.02	.17*	.20	-.52*
Business Studies Student									
No vs. Yes	.15***	-.02	.04	.05	-.04	.20***	.19***	.59***	-.004
English level									
Level 8 vs. Level 1 to 4	-.11	-.17	-.66***	-.16	-.64***	-.42***	.19	-.48	-1.52***
Level 8 vs. Level 5	-.07	-.01	-.51***	-.09	-.34**	-.21*	.13	-.23	-.85***
Level 8 vs. Level 6	.02	.05	-.42***	-.09	-.35**	-.08	.13	-.03	-.71**
Level 8 vs. Level 7	.08	.07	-.18	-.10	-.16	.05	.11	.13	-.27
Maths Level									
Level 8 vs. Level 1 to 4	-.40***	-.30**	-.79***	.05	-.51***	-.57***	-.20*	-1.07***	-1.60***
Level 8 vs. Level 5	-.13*	-.11	-.71***	.03	-.29**	-.29***	-.03	-.44	-1.10***
Level 8 vs. Level 6	-.09	-.13*	-.56***	-.01	-.32***	-.21**	.01	-.32	-1.01***
Level 8 vs. Level 7	-.05	-.04	-.26**	.06	-.20*	-.11	-.02	-.13	-.51**
Receives free school meals									
No vs. Yes	-.01	-.08	-.09	-.06	-.03	-.04	.02	-.08	-.18
Number of books									
more than 100 vs. 0 to 20	-.12**	-.18**	-.53***	-.09	-.10	-.40***	-.03	-.66***	-.81***
more than 100 vs. 21 to 50	-.03	-.01	-.25***	.01	-.15*	-.20***	-.02	-.25	-.41**
more than 100 vs. 51 to 100	.05	.05	-.16**	-.02	-.02	-.06	.07	.02	-.13
Highest education level of one parent									
University vs lower than A levels	-.11**	.04	-.18**	.04	-.06	-.14*	-.08	-.29	-.21
University vs A levels	-.08*	.05	-.01	.05	.07	-.07	-.07	-.18	.12

p<.05, **p*<.01, ***p*<.001

Next, a partial sample was extracted (n=1142) which was the same sample used for the multivariate analyses of the personal finance test scores. Bivariate tests for differences in means were first carried out to check whether similar patterns of associations could be found like in Table 56, followed by the multivariate analyses.

Before carrying out the tests, assumptions for no perfect multicollinearity, homoscedasticity and normally distributed errors were checked.

To check if multicollinearity existed, the VIF (variance inflation factor) and tolerance statistics were examined. It was found that the largest VIF for each model was at most about 2 and according to Bowerman and O'Connell (1990), the largest VIF should not be greater than 10. Also, the average VIF for each model was close to 1 and the tolerance values were all above .2. These indicated that there was no multicollinearity (Bowerman and O'Connell, 1990; Menard, 1995).

For each regression model, plots of standardised residuals against standardised independent variables were checked and shown in Appendix Q. Each plot shows that the points were randomly and evenly scattered throughout. This indicates that the assumptions of linearity and homoscedasticity were met.

As shown in Appendix Q, the histogram and normal P-P plots of the residuals for each regression model appears to be normally distributed.

Appendix T shows the mean percentage scores of the partial sample (n=1142) by the subgroups as well as their standard deviation values. Table 57 presents the bivariate tests for differences in means while Table 58 and 59 presents the multiple linear regression models of the partial sample (n=1142)

Table 57 Bivariate tests for attitude scores (n=1142)

	Importance of personal finance	Attitude towards spending	Attitude towards saving	Attitude towards financial independence	Attitude towards debt	Attitude towards price comparison	Confidence in managing money	Factor 1: Managing money attitudes	Factor 2: Spending money attitudes
Gender									
Male vs. Female	-.21***	.13*	-.07	-.17**	.16	-.12*	-.47***	-.99***	.21
Ethnicity									
White vs. Mixed	.20	.01	.23	-.02	-.08	-.02	.36**	.51	.15
White vs. Asian	.29***	-.03	-.07	.15	-.12	.22*	.26**	.91***	-.23
White vs. Black	.25***	-.07	.03	.03	.38**	.42***	.22*	.92***	.34
White vs. Other	.24	-.14	-.19	.18	.21	.21	.21	.84*	-.10
Financial Behaviour Type									
Saver vs. Spender	-.65***	-1.11***	-.87***	-.51***	-.29	-.44***	-.83***	-2.43***	-2.26***
Saver vs. Mixed Saver/Spender	-.22***	-.24**	-.41***	-.26**	-.09	-.20*	-.37***	-1.04***	-.73***
Saver vs. Entrepreneur	.17	-.20	-.14	.13	.003	.25	.27	.82*	-.32
Business Studies Student									
No vs. Yes	.15**	-.10	-.01	.003	-.02	.12*	.17**	.46**	-.13
English level									
Level 8 vs. Level 1 to 4	-.19	-.15	-.87***	-.26	-.71*	-.46*	.13	-.72	-1.79***
Level 8 vs. Level 5	-.25*	-.09	-.46*	-.09	-.27	-.20	.14	-.40	-.81*
Level 8 vs. Level 6	-.13	-.06	-.52***	-.17	-.41*	-.15	.08	-.38	-1.00***
Level 8 vs. Level 7	-.04	-.06	-.17	-.18	-.20	-.03	.01	-.27	-.42
Maths Level									
Level 8 vs. Level 1 to 4	-.46***	-.32	-1.00***	.20	-.66**	-.53**	-.23	-.98*	-2.00***
Level 8 vs. Level 5	-.24*	-.11	-.74***	-.003	-.17	-.35**	-.12	-.72*	-.99***
Level 8 vs. Level 6	-.17*	-.09	-.57***	-.04	-.30	-.28**	-.10	-.59*	-.97***
Level 8 vs. Level 7	-.12	-.04	-.28	.002	-.12	-.16	-.13	-.42	-.45
Receives free school meals									
No vs. Yes	.02	.03	-.13	.09	-.05	-.04	.15	.22	-.15
Number of books									
more than 100 vs. 0 to 20	-.08	-.12	-.46***	-.14	-.08	-.19	.06	-.36	-.66*
more than 100 vs. 21 to 50	-.10	-.02	-.32**	-.11	-.26	-.09	-.01	-.32	-.61*
more than 100 vs. 51 to 100	.04	.05	-.25*	-.13	-.03	-.04	.07	-.07	-.22
Highest education level of one parent									
University vs lower than A levels	-.06	.14	-.17	.11	.003	.04	-.02	.07	-.03
University vs A levels	-.04	.13	.06	-.04	.05	-.11	-.05	-.24	.25

p<.05, **p*<.01, ***p*<.001

Table 58 Summary of multiple linear regressions for individual attitude scores

	Importance of personal finance		Attitude towards spending		Attitude towards saving		Attitude towards financial independence		Attitude towards debt		Attitude towards price comparison		Confidence in managing money	
Variable	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*	*B*	*(SE B)*
Intercept	4.66***	(.08)	2.96***	(.11)	3.98***	(.14)	4.33***	(.12)	3.73***	(.15)	4.08***	(.11)	4.32***	(.11)
Male vs Female	-.13**	(.05)	.18**	(.06)	.03	(.08)	-.16*	(.07)	.16	(.08)	-.04	(.06)	-.36***	(.06)
White vs mixed	.15	(.08)	.01	(.10)	.25	(.13)	-.06	(.11)	-.02	(.14)	-.01	(.10)	.26*	(.10)
White vs Asian	.24***	(.05)	-.04	(.07)	-.06	(.09)	.14	(.08)	-.06	(.10)	.20**	(.07)	.14	(.07)
White vs Black	.21***	(.06)	-.06	(.08)	.08	(.10)	.02	(.09)	.45***	(.11)	.45***	(.08)	.14	(.08)
White vs Others	.27**	(.09)	-.08	(.11)	-.09	(.15)	.19	(.13)	.28	(.16)	.28*	(.12)	.19	(.12)
Saver vs Spender	-.59***	(.08)	-1.11***	(.10)	-.80***	(.13)	-.47***	(.11)	-.26	(.14)	-.38***	(.10)	-.76***	(.10)
Saver vs Mixed Saver/Spender	-.21***	(.05)	-.25***	(.06)	-.39***	(.08)	-.24**	(.07)	-.11	(.09)	-.18**	(.06)	-.33***	(.06)
Saver vs Entrepreneur	.10	(.08)	-.13	(.11)	-.16	(.14)	.11	(.12)	-.02	(.16)	.18	(.11)	.18	(.11)
business studies (no vs yes)	.10*	(.05)	-.04	(.06)	.02	(.08)	-.02	(.07)	-.02	(.08)	.07	(.06)	.08	(.06)
English level 8 vs level 1 to 4	.10	(.14)	.13	(.19)	-.11	(.25)	-.59**	(.21)	-.24	(.27)	-.11	(.19)	.31	(.19)
English level 8 vs level 5	-.13	(.09)	.06	(.12)	.03	(.16)	-.25	(.14)	-.05	(.17)	.02	(.13)	.22	(.12)
English level 8 vs level 6	-.07	(.08)	.06	(.10)	-.20	(.13)	-.24*	(.11)	-.23	(.14)	.02	(.10)	.13	(.10)
English level 8 vs level 7	-.02	(.07)	-.01	(.09)	-.03	(.12)	-.21*	(.10)	-.13	(.13)	.05	(.09)	.03	(.09)
Maths level 8 vs level 1 to 4	-.39**	(.12)	-.39*	(.16)	-.92***	(.21)	.48**	(.18)	-.57*	(.23)	-.43**	(.16)	-.34*	(.16)
Maths level 8 vs level 5	-.12	(.08)	-.18	(.11)	-.61***	(.15)	.20	(.12)	-.15	(.16)	-.30**	(.11)	-.14	(.11)
Maths level 8 vs level 6	-.06	(.07)	-.12	(.09)	-.43***	(.11)	.14	(.10)	-.26*	(.12)	-.24**	(.09)	-.08	(.09)
Maths level 8 vs level 7	-.05	(.06)	-.03	(.08)	-.19	(.10)	.10	(.09)	-.06	(.11)	-.13	(.08)	-.09	(.08)
free school meals (no vs yes)	.01	(.07)	.04	(.09)	.02	(.12)	.12	(.10)	-.06	(.13)	-.03	(.09)	.11	(.09)
more than 100 books vs 0 to 20 books	-.09	(.07)	-.06	(.09)	-.28*	(.12)	-.22*	(.10)	-.05	(.13)	-.21*	(.09)	-.01	(.09)
more than 100 books vs 21 to 50 books	-.12*	(.06)	-.01	(.07)	-.19	(.10)	-.18*	(.08)	-.22*	(.11)	-.10	(.08)	-.07	(.08)
more than 100 books vs 51 to 100 books	.01	(.05)	.04	(.07)	-.21*	(.09)	-.14	(.08)	-.05	(.10)	-.08	(.07)	.06	(.07)
University vs lower than A levels	.04	(.06)	.13	(.07)	-.01	(.10)	.15	(.08)	.13	(.10)	.21**	(.07)	.02	(.07)
University vs A levels	.07	(.05)	.10	(.07)	.16	(.09)	.02	(.08)	.17	(.10)	.06	(.07)	.03	(.07)
R^2	.14		.12		.11		.06		.05		.09		.14	

**p<.05, **p<.01, ***p<.001*

Table 59 Summary of multiple linear regressions for clustered attitude scores

	Factor 1: Managing money attitudes		Factor 2: Spending money attitudes	
Variable	*B*	*(SE B)*	*B*	*(SE B)*
Intercept	17.41***	(.26)	10.68***	(.25)
Male vs Female	-.70***	(.14)	.37**	(.14)
White vs mixed	.33	(.23)	.23	(.23)
White vs Asian	.72***	(.17)	-.18	(.17)
White vs Black	.82***	(.18)	.47*	(.18_
White vs Others	.91**	(.27)	.12	(.27)
Saver vs Spender	-2.20***	(.24)	-2.16***	(.24)
Saver vs Mixed Saver/Spender	-.94***	(.15)	-.75***	(.15)
Saver vs Entrepreneur	.56*	(.26)	-.30	(.26)
business studies (no vs yes)	.25	(.14)	-.04	(.14)
English level 8 vs level 1 to 4	-.24	(.45)	-.31	(.44)
English level 8 vs level 5	-.15	(.29)	.03	(.29)
English level 8 vs level 6	-.17	(.24)	-.36	(.23)
English level 8 vs level 7	-.16	(.22)	-.17	(.21)
Maths level 8 vs level 1 to 4	-.67	(.38)	-.18***	(.38)
Maths level 8 vs level 5	-.38	(.26)	-.92***	(.26)
Maths level 8 vs level 6	-.24	(.21)	-.81***	(.21)
Maths level 8 vs level 7	-.19	(.19)	-.28	(.19)
free school meals (no vs yes)	.20	(.21)	-.01	(.21)
more than 100 books vs 0 to 20 books	-.55*	(.22)	-.38	(.22)
more than 100 books vs 21 to 50 books	-.48**	(.18)	-.41*	(.17)
more than 100 books vs 51 to 100 books	-.18	(.16)	-.21	(.16)
University vs lower than A levels	.43*	(.17)	.25	(.17)
University vs A levels	.18	(.17)	.44**	(.17)
R^2	.19		.15	

**p<.05, **p<.01, ***p<.001*

A comparison of the findings shown in Tables 56 and 57 confirmed that there were similar patterns of associations based on the differences in mean attitudes by independent variables except for the number of books in a household (family wealth) and parents' education. Hence, these variables were excluded from further analyses and discussion here.

Based on the results from the multiple linear regression models in Tables 58 and 59, it was inferred that gender, ethnicity, financial behaviour type and mathematics levels were strongly associated with financial attitudes. Before controlling for the other variables, females had lower levels of "Managing money" attitudes than males. After controlling for the other independent variables, females still had significantly lower levels of "Managing money" attitudes but their levels of "Spending money" attitudes became significantly higher than males. This suggests that the female respondents were better at spending money while the male respondents were better at managing money.

Ethnicity was still a significant correlates for some attitudes even after controlling for the other independent variables. When asked how important they felt about knowing how to manage money, Asians, Blacks and "Others" were more likely to feel more important about being financially literate than the Whites by about 0.2 points. In particular, Blacks were significantly more debt adverse and liked to compare prices more than respondents from the other ethnic groups. Whites were less inclined to compare prices. Overall, Blacks had significantly higher levels of "Managing money" and "Spending money" attitudes compared to the Whites while Asians and the "Others" had significantly higher levels of "Managing money" attitudes compared to the Whites.

Except for attitudes towards debt, both the “Spenders” and “Mixed Saver/Spenders” had significantly lower levels of desired attitudes than the “Savers”. These results were significant even after controlling for the other variables.

Many significant differences in attitudes due to English levels and being a business studies student became less significant after controlling for other variables. This suggests that financial attitudes were weakly associated with literacy and being a business studies student.

Some financial attitudes were still strongly associated with Mathematics levels, even after controlling for the other variables. Those who were more numerate tended to have higher levels of desired attitudes towards saving money and comparing prices.

6.3 The relationships between financial knowledge and attitudes

The analyses in this section will answer the following research question:

> *Based on a sample of fifteen-year-olds from Oxfordshire and Greater London, what was the extent of the relationships, if any, between their financial knowledge and skills; and their financial attitudes?*

Table 60 shows the correlations between financial knowledge and skills (FKS); and various financial attitudes. In this study, financial knowledge consisted of three domains: "Money and transactions" (MT); "Planning and managing finances" (PMF) and "Financial risk and rewards" (FRR). Here, I considered scores for each attitude; the total attitudes score for each respondent as well as the scores grouped by factors shown in Section 6.2.2. The Pearson's correlation coefficient formula was used to calculate the correlation statistics (Field, 2009).

There was a significant relationship between personal finance test scores and total attitude scores, r=.28, *p* (two-tailed) <.05. The effect size was medium according to Cohen (1988, 1992). If the correlation coefficient r is .10, the effect size is small; for r=.30, the effect size is medium and for r = .50 and above, the effect size is large (Cohen, 1988, 1992). This indicates that those who had higher levels of financial knowledge and skills were also likely to have higher levels of desired financial attitudes. The values of the correlation coefficients ranged from .01 (lowest) to .28 (highest). This shows that different financial attitudes had different degrees of relationships with financial knowledge and its domains.

Table 60 Correlations between FKS and attitudes

	FKS	MT	PMF	FRR
Knowing how to manage money is important to me.	.16**	.13**	.14**	.11**
Money is there to be spent.	.11**	.08**	.09**	.09**
I should start saving money only when I have a paying job.	.25**	.20**	.23**	.15**
I would rather earn my own money than to ask my parents for money.	.04**	.02	.05**	.04*
I am comfortable about owing someone money.	.14**	.12**	.13**	.07**
I like to compare prices.	.18**	.16**	.16**	.08**
I am confident of managing my own money.	.02	.05**	.01	-.01
Total attitudes score	0.28**	0.24**	0.26**	0.16**
Factor 1: Managing money attitudes	0.17**	0.14**	0.15**	0.09**
Factor 2: Spending money attitudes	0.26**	0.22**	0.24**	0.15**

*p <.05 (2-tailed), **p<.01 (2-tailed)

There was a lack of relationship between FKS and confidence in managing one's money, r = .02, *p* (two-tailed) >.05. This suggests that performance on the test did not correlate well with confidence in managing one's money.

There was a significant relationship between the personal finance test scores and "Managing money" attitudes (Factor 1), r=.17, *p* (two-tailed) <.05. The relationship between the personal finance test scores and "Spending money" attitudes (Factor 2) was also significant, r=.26, *p* (two-tailed) <.05. However, based on their effect sizes, it can be inferred that "Spending money" attitudes are a better predictor of financial knowledge and skills than "Managing money" attitudes and vice versa.

6.4 Summary

A convenience sample of 3115 Year 10 students from 28 schools in twenty local education authorities in Oxfordshire and Greater London took the personal finance test and achieved an overall mean percentage score of 56%. The test was made up of three domains namely "Money and transactions" (MT), "Planning and managing finances" (PMF) and "Financial risk and rewards" (FRR). These participants performed best in the PMF domain. Performance on individual questions within each domain highlighted areas of strengths and weaknesses in knowledge and skills concerning various personal finance topics. This demonstrated the usefulness of such a test to be used as a diagnostic tool or for teaching purposes.

The correlates of financial knowledge and skills were investigated using both bivariate and multivariate analyses. Three groups of independent variables were investigated: personal characteristics; educational variables and family related variables.

The analyses strongly indicated that the significant correlates of financial knowledge and skills were Mathematics levels, English achievement levels, ethnicity gender and financial behaviour type. Being a business studies student and parents' level of education were unlikely to be significant correlates of financial knowledge and skills.

Attitudes towards various aspects of managing personal finances were measured using seven self-assessment statements where higher scores were awarded for having more desired attitudes. The distribution of choices and overall mean scores showed that most participants had rather desirable attitudes in terms of the importance placed on being financially literate; inclination towards comparing prices; desire for financial independence and confidence in managing money. In comparison, attitudes towards debt, saving and spending were less desirable.

Both bivariate and multivariate analyses suggested that the correlates of financial attitudes were gender, ethnicity, financial behaviour type and Mathematics levels.

The associations between family related variables and the key aspects of financial literacy were found to be weak. Bivariate tests on differences in the personal finance test scores and family related variables were significant but when the other variables were controlled for in the multivariate analyses, the differences became less significant. The results were similar for financial attitudes.

Finally, it was found that there was a positive and significant relationship between financial knowledge and skills; and overall financial attitudes. However, there was no significant relationship between financial knowledge and confidence in managing one's personal finances.

Chapter Seven: Discussion of findings and conclusions

This chapter will discuss the wider implications of the research findings. Next there will be a discussion about the limitations of the research and the chapter will conclude with suggestions for future research.

7.1 An instrument to assess young people's financial literacy

The first objective of this study was to develop a UK based instrument which would be used to measure the key aspects of young people's financial literacy. There are many aspects of financial literacy and the instrument designed in this research used a personal finance test to produce a single measure of financial knowledge and skills. The other key aspect of financial literacy assessed was financial attitudes which looked at levels of desired attitudes towards various topics of personal finance. Figure 21 shows how both aspects contribute to being more financially literate.

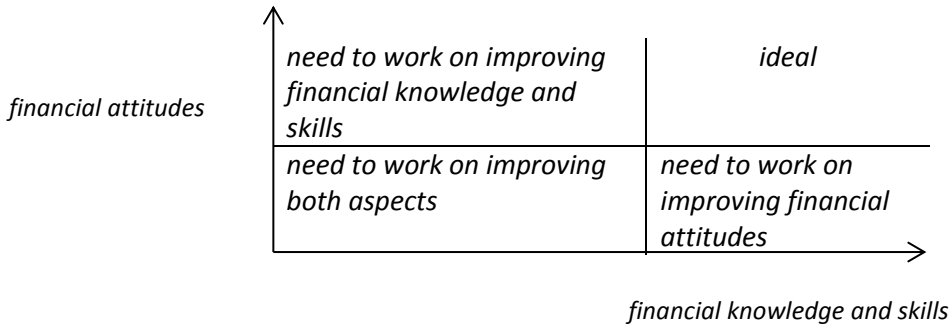


Figure 21 Key aspects of financial literacy

Young people should have both high levels of financial knowledge and skills as well as high levels of desired financial attitudes. However for some, they might lack some of the relevant financial knowledge and skills but have high levels of desirable attitudes. Or it can be the other way round where they have high levels of financial knowledge and skills but have low

levels of desirable attitudes. It could also be possible that they have low levels in both aspects.

At the individual level, the personal finance test within the instrument is useful as a "questioning tool" as well as an assessment tool to help assess one's current level of financial knowledge and skills. There are many ways in which young people receive financial education. They can receive information from family, friends, social media, television and newspapers. However, they are rarely given a chance to recall and demonstrate their acquired knowledge and skills. In 2011, the inquiry carried out by the APPG on financial education for young people found that not only was the provision of financial education inconsistent, there was very little assessment being carried out. Only 20% of the schools surveyed had carried out any form of assessment (The All-Party Parliament Group on Financial Education for Young People, 2011). Similarly, Ofsted (2008) found that for financial education, schools often failed to communicate the learning objectives to students and the students' progress was rarely monitored. This instrument can help students become more aware of their financial knowledge, skills and attitudes. This can also stimulate more discussions on various personal finance topics which will also encourage them to seek answers on their own.

At the school level, the instrument can serve various needs. For classroom teachers, the personal finance test is useful as a teaching tool to introduce a new topic or can be used before a lesson to carry out a baseline assessment of the levels of knowledge and skills. Each test items had a specific testing objective which was also linked to one of the three main content domains. This is useful for making lesson plans. Each test item also had an estimated level of difficulty, so teachers can select the relevant test items to check students' progress.

The test items can also be easily modified for formative or summative assessment. Financial attitudes can also be assessed before and after a school year to monitor how students' financial attitudes have changed.

At the policy level, information about young people's financial literacy can support policies for intervention and research. Currently, the UK-based research evidence is mainly about young people's behaviour in managing money (Personal Finance Education Group, 2010b; The Royal Bank of Scotland Group, 2010; 2011; 2012; 2013; Money Advice Service, 2013b; ifs University College, 2014). However, little is known about their financial knowledge, skills and attitudes. The instrument designed in this research can be used in future research to evaluate the effectiveness of financial education initiatives or for carrying out baseline research. Such findings can support financial education policies for schools.

7.2 Financial knowledge and skills

The overall mean percentage score of the personal finance test was about 56%. The domain, "planning and managing finances" (PMF) had the highest mean score amongst the three domains at about 57%, followed by "money and transactions" (MT) at about 56% and "financial risk and reward" (FRR) at about 53%.

By examining the performance on individual questions within the PMF domain, the areas of strengths and weaknesses were revealed. It was found that their strengths were in budgeting skills and in their knowledge of income-related matters. For instance, about 73% were able to identify parts of a payslip and about 71% knew about the purpose of taxes. More than half were able to plan for a future expense by examining a budget; make sound decisions to balance a budget as well as make rational decisions to increase savings. In contrast, less than half understood the impact of compound interest.

The results from the MT domain indicated that the respondents were rather knowledgeable about basic bank products, methods of payment and bank charges. For example, about 80% knew what an overdraft is and more than half knew about the use of bank cards and various methods of payment. They were also reasonably capable at performing basic mathematical calculations, for example about 57% were likely to be able to carry out currency conversions. However, they were relatively weaker in their knowledge about credit card use and skills such as selecting, using and processing relevant financial information. Only about 31% understood the nature of a transaction involving a credit card which indicated that their understanding in this area was low.

Another interesting finding was when the task became more complicated, more were unable to cope. Although this is a reasonable finding, it highlights the need for schools to go beyond just focusing on the financial mathematics aspect. Schools can help by carrying out projects or lessons to raise young people's awareness about real life financial situations. For example, when getting a mortgage, there are many other factors which need to be considered besides the price. One also needs to consider more than just the cost of a mobile phone when deciding which provider to sign a mobile phone contract with. By increasing their awareness about these topics, young people will become more knowledgeable and skilful which will be helpful when they actually get a real chance to make such financial decisions.

The results from the FRR domain suggested that knowledge about investments was quite weak. Although this domain was regarded by some experts to be less important than the other two domains, it is important for young people to understand how the value of their assets and liabilities change due to risk factors. Even though young people are unlikely to be

involved in financial investments, it is important for them to have some knowledge of what they can expect in the future.

Other studies have suggested that many young people either lacked financial knowledge and skills or did not feel confident that they could manage money well (Financial Services Authority, 2004c; Financial Services Authority, 2004d; Personal Finance Education Group, 2010b; The Royal Bank of Scotland Group, 2012; ifs University College, 2014). In addition, there has been very little scholarly research evidence about the specific types of financial knowledge that young people had or lacked in. This study has provided useful and specific information about where the gaps in young people's financial knowledge lie. These findings support the need to educate young people more about interest rates, credit and loans.

It is essential to remind ourselves again why it is important that we know about the strengths and weaknesses of young people's financial knowledge and skills. The aspects of financial knowledge and skills contribute to their overall financial literacy which also helps them to become financially capable. For the young people who are still in schools, teachers have much control over what can be taught. Earlier, it was pointed out that the personal finance test in the instrument included topics which are important for all young people. Now, the test results have identified specific areas which require more education. Coincidentally, many of these weak areas often coincide with problems faced by young people as reported in the media (Clarke, 2013, Money Advice Service, 2014a, 2014b). Also, if teachers know about their students' strengths in financial knowledge and skills, they can prioritise their teaching plans accordingly.

7.3 Young people's financial attitudes

The respondents' attitudes towards various personal finance topics were measured using self-assessed statements. Higher scores were awarded for indicating more desirable attitudes. The results in this study showed that some attitudes had more favourable results than others. About 89% of the respondents agreed that knowing how to manage money was important to them. This confirmed findings from another study where 90% of a representative sample of 11 to 19 year-olds felt that it was important to learn about managing personal finances (The Royal Bank of Scotland Group, 2012). This suggested that many young people do want to learn how to manage their money better and investments in financial education will not be in vain.

Confidence in managing money was found to be high; about 74% indicated that they were confident about managing their own money. More needs to be done to find out the reasons behind the lack of confidence for the other 26% as well as the factors that led to low confidence. Nevertheless, the findings were an improvement from a 2003 study where the level of confidence found in young people was only about 43% (Financial Services Authority, 2004b). It could be possible that these results were attributed to the various financial education initiatives which have gained more traction over the last ten years (All-Party Parliament Group on Financial Education for Young People, 2011).

About 67% of the respondents indicated that they would rather earn their own money than to ask their parents for money. Wanting to be financially independent through paid work bodes well for ensuring future financial wellbeing in a changing financial landscape in the UK, where state income support has been decreasing and more has been demanded of individuals to look after their own financial needs (Whitehouse, 2000). In contrast, back in

2003, many young people felt that they were living in carefree times where jobs were perceived to be readily available with rare instances of forced unemployment; they also rebelled against adult responsibilities by living with their parents (Financial Services Authority, 2004d). Whether it was due to the changing financial landscape or the increased effectiveness of financial education initiatives, attitudes about financial independence appeared to have improved. Still, it is important to instil financial independence in young people so that they will be more resilient and can weather tougher economic conditions.

About 55% of the respondents were uncomfortable about owing someone money. This implied that about 45% of them might not have desirable attitudes towards debt. This confirmed findings from other studies which showed unhealthy attitudes towards debt. Some young people are too comfortable about being indebted (Financial Services Authority, 2004d); many regarded credit and student loans as “free money” (Financial Services Authority, 2004d; ifs University College, 2014) and dismissed loans from family and friends as debt (ifs University College, 2014). Such attitudes towards debt can have a negative impact on financial well-being. For instance, not paying credit card bills on time might hurt one’s credit rating. There has been mounting evidence that more young people were becoming heavily indebted. About 82% of 11 to 17 year-olds have borrowed money at some point in their lives (Personal Finance Education Group, 2010b). In 2012, about 21% of 18 to 24 year-olds were considered over-indebted which meant that they either felt that their debt was a heavy burden or that they have missed or fallen behind repayments for 3 out of the last 6 months (Money Advice Service, 2013a).

Being over-indebted can increase the risk of mental health problems, homelessness and increased risk taking behaviour in young people (Action for Children, 2014). Therefore, it is

not just about teaching young people about debt, it is also critical to help them realise the ramifications of over-indebtedness, so that their attitudes towards debt can improve.

This study also found that attitudes towards saving money and comparing prices were more favourable than attitudes towards spending. For many young people, they are more likely to spend money more often than earning it or saving it. For the majority of fifteen-year-olds, their main source of "income" is from receiving pocket money. It is more likely that they will spend most of their money when they receive it. 99% of them owned mobile phones and they tend to spend money on technology goods such as music, DVDs, computer games, clothes (Personal Finance Education Group, 2010b). However, if schools were to show them how their savings can be compounded over time, they might put in more conscious efforts to save.

Collectively, all these results implied that for young people, spending is inevitable and it is important that financial education should emphasise more about the negative consequences of overspending (Money Advice Service, 2014a) so that they would increase their propensity to save money as well as to be discerning about expenditures.

7.4 Correlates of financial literacy

In Chapter Two, there was a discussion about how some variables might be closely associated with the different aspects of financial knowledge and skills. Most of the research findings showed that in general, females; those from ethnic minority groups and those who were more educated were more likely to have higher levels of financial literacy. There was also some research evidence which suggested that financial literacy was also associated with literacy, numeracy, educational variables and family background variables. Thus, variables from three main groups were tested to examine their relationship with the personal finance

test scores and financial attitude scores which were collected in this research. In the following sub-sections, the significant correlates will be discussed first, followed by the variables which turned out to be less associated with financial literacy than was assumed previously.

7.4.1 Gender

This study found that females were likely to have significantly lower levels of financial knowledge and skills than males, even after controlling for all the other independent variables. This confirmed the findings of previous studies (Danes and Hira, 1987; Chen and Volpe, 1998; 2002; Beal and Delpachitra, 2003; Lusardi et al, 2010). However, my findings were different to that of OECD (2014) where it was found in the PISA 2012 data that there were no significant differences in financial literacy test scores for both genders, after controlling for reading and mathematics.

In terms of financial attitudes however, females were found to have more desirable attitudes than males in some ways. My findings showed that females had more desirable attitudes than males in terms of "Spending money" attitudes; they were more likely to save more and accumulate less debt than men. On the other hand, females had less desirable attitudes in terms of "Managing money" attitudes; they were less concerned about the need to be financially literate, were less confident about managing their own money and there was less desire to want to be financially independent. These findings confirmed that of previous studies which found that females were less enthusiastic, confident and less concerned about financial education than men (Chen and Volpe, 1998; Ibrahim et al, 2009; Towson, 2013).

It is important that we try to close the gender gaps in financial literacy. Previous studies have shown that many women struggled to manage their finances due to changes in life circumstances such as becoming a single parent, getting a divorce and when their partner passed away suddenly (Financial Services Authority, 2001; Hung et al, 2012). Being financially literate will help them cope better in these unexpected circumstances.

7.4.2 Ethnicity

In terms of ethnicity, Whites did better on the personal finance test than those from the other ethnic groups. These results were similar to the findings in other studies (Symanowitz, 2006; Mandell, 2009a; Lusardi, 2010) where the ethnic majority (usually Whites) were found to have significantly higher financial knowledge and skills compared to the ethnic minority (usually Africans, Hispanics, Asians or Native Americans). In the case of the United States, it has been suggested that low levels of English language skills and numeracy found amongst the ethnic minorities were the reason why these groups struggled with managing personal finances (United States Government Accountability Office, 2010). However, in terms of financial attitudes, Whites were found to have less desirable attitudes overall, especially in "Managing money" attitudes. Even after controlling for the other variables, Whites were much less likely to feel important about being financially literate and were also less likely to do price comparisons.

Although Black respondents had significantly lower scores on the personal finance test as well as the domains, even after controlling for other variables, they were more likely to have more desirable attitudes in terms of both "Managing money" and "Spending money" attitudes. Asians also had more desirable attitudes than Whites in terms of "Managing

money" attitudes, even though they did not do as well as the Whites on the personal finance test.

These results supported some of the findings from a previous qualitative research done in the UK where it was found that young people from certain ethnic groups exhibited much more desirable attitudes than those from the other ethnic groups (Financial Services Authority, 2004d). Specifically, young Asians were strongly influenced by their families to save money. On a regular basis, they discussed personal finances openly with their families. They felt financially responsible for their own finances; had very strong work ethics. Many of the young black Afro-Caribbeans interviewed indicated a strong sense of responsibility to contribute to their families' household incomes.

If some financial attitudes were linked to ethnicity, it could be hard to create change as each ethnic group has their own ingrained practices, values and experiences. Financial educators could perhaps make use of positive examples found within different ethnic groups to improve attitudes in students. This would not only help to improve awareness of desirable attitudes but also improve cultural understanding between different groups.

There has not been any study done in the UK which examined the relationships between financial knowledge and ethnicity. These results indicated the need for future studies to understand how ethnicity could be related to young people's financial knowledge and skills. Nevertheless, now that we know there are significant differences in financial knowledge and skills within different ethnic groups, especially for the Black students, it is hoped that the provision of adequate financial education in schools can help to close the gaps.

7.4.3 Financial behaviour type

In terms of financial behaviour types, “Spenders” were found to have significantly lower scores on the personal finance test. They were also more likely to have lower levels of desired attitudes in most of the attitudes assessed. Previous research found that “Spenders” were more likely to be over-indebted, liked to buy things on credit and had little savings (Kempson and Atkinson, 2006). Now, there is more evidence which suggested that “Spenders” were likely to have lower levels of financial knowledge and skills which could have resulted in them making poor financial decisions such as carrying over credit card balances and getting payday loans. Their poor understanding of interest can also contribute to being over-indebted (Emmons, 2005).

For those who were “Mixed Saver/Spenders”, their financial knowledge and skills were not significantly lower than that of the “Savers”. However, most of their financial attitudes were less desirable than the “Savers”. This group made up the majority of the sample at 57%. It will be useful for them to know that they need to focus more on their attitudes as it could be the reason why they might feel that they know how to manage their money but struggled to resist overspending their money.

7.4.4 Literacy and numeracy

Those who had higher Mathematics levels were likely to have higher levels of financial knowledge and skills. For instance, all things being equal, those with a Mathematics level of 8 would tend to score 27% more on the overall test compared to those with Mathematics levels between 1 and 4. A similar relationship was found with English achievement levels. This supported the findings from other studies about the positive relationship usually found between literacy, numeracy and financial literacy (Banks and Oldfield, 2007; Mandell, 2009a;

Christelis et al, 2010; Gerardi et al, 2010; Lusardi et al, 2010; OECD, 2014). Also, Murray (2011) had argued that many adult financial decisions were complex and required high levels of literacy and numeracy in order to make these decisions effectively. Hence, it is likely that efforts made in schools to improve young people's literacy and numeracy could also potentially benefit their financial knowledge and skills.

However, while being literate and numerate to a certain degree can help improve one's financial literacy, there are aspects of managing money which require more than basic literacy and numeracy skills (OECD, 2010). This was evident in the 2012 OECD PISA findings where in some countries, higher achievements in reading and Mathematics did not necessary bring about higher scores on the financial literacy test. Also, my multivariate models showed that about 65% of the variance in the personal finance test scores could not be explained by all the other independent variables (which included literacy and numeracy). This further emphasises the need for financial education.

While financial education is necessary to help children improve their financial literacy, Mathematics education is also crucial to help children be equipped with the basic numeracy skills to make the right financial decisions (Carpena et al, 2011), increase financial market participation (Cole et al, 2014), improve creditworthiness (Brown, Collins, Schmeiser and Urban, 2014), decrease reliance on debt, bankruptcy and default of loans (Brown, Grigsby, van der Klaauw, Wen and Zafar, 2014). The findings of this study strongly supported the inclusion of financial mathematics in the financial education curriculum (All-Party Parliament on Financial Education for Young People (2011). As suggested by Carpena et al (2011), a sequential approach of financial education might be more effective in improving financial literacy; information about financial products and concepts to improve awareness and

attitudes should be provided before enhancing numerical skills. When financial education was incorporated into a Mathematics curriculum to help students learn about saving and investing, Hinojosa et al (2010) found that there was a significant improvement in both Mathematics learning as well as in financial literacy concepts of saving and investing. Financial education and Mathematics education can be mutually beneficial, especially in the current UK's National Curriculum.

Mathematics levels were also significantly correlated with desirable attitudes towards saving, having debts and comparing prices. This could be due to the fact that these topics involved more mathematical skills than the other aspects of personal finance. Those who were more numerate might also be more motivated and interested to save, have less debt and compare prices.

7.4.5 Less significant correlates

This study did not find a significant relationship between being a business studies student and one's financial literacy. Those who were business studies students tended to have higher scores in the PMF domain only. The association between financial attitudes and being a business studies student was also weak. These findings were different from findings in other studies which showed that university students specialising in business related subjects had significantly higher levels of financial knowledge (Chen and Volpe, 1998; Beal and Delpachitra, 2002; Bird, 2008; Fatoki, 2014). Obviously, the GCSE business studies curriculum was less comprehensive than those offered in universities. However, these findings implied that the provision of financial education for business studies students should not be overlooked. There are many secondary schools in the UK which specialise in business and enterprise subjects. It can be easily taken for granted that personal finance "comes

naturally" to students in these schools (Ofsted, 2011) but a more prudent approach is to carry out a baseline assessment in order to ascertain the areas of concern for business studies students.

This study did not find a strong association between family related variables and financial literacy. Initially, the bivariate test results showed a significant and positive correlation; those from wealthier families and whose parents were more educated had higher levels of financial knowledge and skills. However, after controlling for the other variables, there was not a distinct pattern. In addition, some findings became less significant. It was also likely that there were other family related variables which could have been correlated with the scores but were not investigated in this study.

Previous studies have shown that families were crucial to young people's financial socialisation (Webley and Nyhus, 2006; Jorgensen and Savla, 2010; Shim et al, 2010; Grohmann et al, 2014b). In fact, many studies had found a positive relationship between family wealth and young people's financial knowledge (Chen and Volpe, 1998; Symanowitz, 2006; Mandell, 2009a; Lusardi et al, 2010; Sabri et al, 2010; Cameron et al, 2014; Grohmann, 2014b). Also, parents' education was also found to be positively correlated with young people's financial knowledge (Mandell, 2009a; Lusardi et al, 2010; Grohmann, 2014b). However, all these studies were not carried out in the UK. So it might be possible that in the UK, familial influences on the financial knowledge and skills of the young are not as significant as hoped. The study by the Financial Services Authority (2000a) showed that children from wealthier families (where parents were assumed to be more educated), had lacked the knowledge and skills like budgeting which were found more often in children

from poorer families. The study highlighted that there were distinct differences in the types of financial knowledge and skills that children had, as a result of their family backgrounds.

However, it was possible that many of the respondents in the main study did not rely on their families for financial knowledge and skills. They could have learnt it in schools, from friends, the social media and from the Internet. Their financial attitudes could also have been shaped more by these influences rather than from their parents.

7.5 Relationships between financial knowledge and financial attitudes

This study found that there was a positive and small correlation between financial knowledge (and skills) and most financial attitudes. Based on the guidance from Cohen (1988; 1992), the small correlation values suggested that there could be a small and positive correlation. This means that those with more positive attitudes could possibly have higher levels of knowledge and skills. The correlation analyses highlighted some salient relationships between some attitudes and financial knowledge. Those who felt more strongly that managing money is important; those who had a higher desire to save money if they have any and those who liked to compare prices, would likely have higher levels of financial knowledge.

However, as there was no correlation found between confidence in managing personal finances and levels of financial knowledge (and skills), it implied that confidence does not always indicate the ability to manage money.

The weak relationships between financial knowledge and attitudes implied that policy makers should not assume causation here. In other words, we should not only attempt to improve only one aspect and hope that the other would be improved due to a spill-over effect. This research has shown that both are key aspects in the concept of financial literacy

and both have different correlates. A holistic program of financial education should be built around improving both financial knowledge and attitudes at the same time.

7.6 Limitations of research

This research could only be carried out in schools who had agreed to take part. The characteristics of such schools might be different from those who did not wish to take part. Unfortunately, it was not possible to determine whether schools' willingness to participate might have an influence on the overall results. The research data was collected from schools which had agreed to take part. Fifteen-year-olds from schools which refused to take part might have significantly different levels of financial literacy. It is possible that there might be significant differences between the characteristics of respondents from schools who agreed to participate in the study and those that refused. Some schools might be more confident in their students' performance on the test questions and be more inclined to participate in the study. It could also be possible that these schools might be more interested in financial education and were concerned about students' financial literacy. Most schools already had difficulty finding curriculum time for financial education (Financial Services Authority, 2002; Financial Services Authority, 2006e; All-Party Parliament Group on Financial Education for Young People, 2011), let alone research on financial education. There is a need to encourage more schools to take part in such research by providing incentives such as teaching resources (Sim, 2014b).

Information obtained from respondents was completely voluntary and as Bryman (2008) pointed out, researchers can never be perfectly sure about whether respondents are taking the test seriously. Questionnaires which were grossly incomplete or filled with obviously sarcastic answers have been left out of the study. Also, respondents might not have known

some of the answers to the background questions about their parents. The data obtained from the respondents were voluntary and might not be totally accurate. It would be ideal if records of the respondents' were made available for the research but best efforts were made to discard cases where it was obvious that the respondent was giving rubbish answers.

Convenience samples were used for both the pilot and main studies. Respondents were recruited from Oxfordshire and Greater London only, due to limited financial resources, time and manpower. It would have been ideal for each study to achieve a representative sample of which meant that a random sample from each Local Education Authority would be needed.

There was a limited amount of data which could be collected from fifteen-year-olds in one hour. The length of a survey meant for fifteen-year-olds could not be more than an hour as survey fatigue would lead to less reliable data.

As this is a cross-sectional research and not an experimental research design, the correlates of financial literacy drawn could not be treated as determinants of financial literacy.

7.7 Suggestions for further research

The instrument developed was a paper-based survey and there is potential for a similar survey to be developed, perhaps in the form of an electronic survey. Such a survey might help to achieve representative samples from various parts of England more efficiently.

The test questions were in the multiple choice question format. Test items of this nature do limit the topics that could be tested. Therefore, future research could incorporate and test other formats, such as free response and short answer questions.

More research could be done in terms of designing different types of questions and piloting them with students in other age groups. Teachers could also be involved in the research process, such as designing and validating new questions which could be added to the item bank. Parallel questions could also be constructed so that there are more questions in the item bank which could be used for future research in the field.

This is a quantitative study and the results could be used to steer the direction for more qualitative studies to understand why young people lack certain aspects of financial literacy (Ahsan, 2013). Such studies would also be able to account for differences in financial literacy due to personal characteristics such as gender and ethnicity. For instance, it was found in this study that Black students' financial knowledge was significantly lower than those of other races, but their attitudes tended to more desirable. It would be interesting to know about the reasons behind such findings.

Future research could possibly measure other aspects of financial literacy which were not included in this research. Financial behaviour has been regarded by some to be quite important (Elliot et al, 2010). More research would have to be carried out to determine what types of behaviour are expected of fifteen-year-olds and how to measure them.

There are other correlates which could be investigated in future. These could include neighbourhood statistics as environmental related variables; learning styles as part of personal characteristics and other education related variables such as characteristics of schools. Family related variables such as parents' type of occupation could also be investigated.

Finally, as the provision of financial education was found to be rather sporadic (Formby et al, 2011) and financial education only became compulsory in the UK's National Curriculum

recently (Knapman, 2013), the survey developed in this study might be useful to examine the impact that compulsory financial education has on young people's financial literacy (Sim, 2014a).

7.8 Conclusions

This research has taken the field of measuring financial literacy one step further by showing how it was possible to design a comprehensive instrument which went beyond measuring only financial knowledge. By improving the types of test questions asked as well as including a basic measurement of attitudes, a more balanced perspective of financial literacy has been achieved. The results from many previous studies which measured financial literacy could be contentious as financial knowledge was usually the proxy for financial literacy. Large scale studies such as the OECD PISA financial literacy test usually provide general information about performance by countries instead of publishing detailed results for each country.

The results from this research painted a more holistic perspective about young people's financial literacy in the UK who were based in urban cities like Oxford and London. Quite often, young people's spending habits and lack of financial knowledge have been negatively highlighted in the media. The findings showed that young people were more knowledgeable in some areas; they also had different attitudes towards different aspects of personal finance. The situation is not all that gloomy and there is hope that young people's financial literacy could be improved in future, leading to more favourable financial behaviour in their adult years.

It was found that when it comes to understanding the correlates of financial literacy, it is still a muddled, tangled and complex web yet to be fully understood. For instance, if we found a significant relationship between financial literacy and one other independent variable like

gender, it could be that there is a genuine effect of gender or it could be that some other more fundamental determinant of financial literacy is strongly correlated with gender and that gender is simply picking up this effect. Nevertheless, this research has highlighted some key correlates; no intervention can be improved unless we know where the problems lie.

My findings have shown that there were significant differences in financial literacy between different groups of variables. Financial literacy could differ by personal characteristics, education and family related variables. Therefore, schools can provide opportunities and access to resources for students of different backgrounds and life experiences to help them develop their ability to manage finances (Taylor, 2011a).

Young people's financial literacy can be improved in several ways, whether through cross-curricular financial education (Rose, 2009), standalone financial education classes or indirectly through improving literacy and numeracy. Whichever form it takes, the assessment of financial literacy should not be ignored.

Education is meant to prepare students for life's challenges and we cannot send young people out into the world without having any financial knowledge and skills. By the time they get settled into jobs and adult responsibilities, there is hardly much time to "learn" how to be financially literate or capable. Whilst literacy and numeracy are important for young people to navigate every aspect of their lives at work and in practical everyday activities at home, it is equally important to help young people understand financial issues as the younger generations are likely to face more uncertain economic times ahead (OECD, 2012).

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APPENDIX A Ethics approval by university

University of Oxford

CENTRAL UNIVERSITY RESEARCH ETHICS COMMITTEE (CUREC)

CUREC/1A Checklist for the Social Sciences and Humanities

The University of Oxford places a high value on the knowledge, expertise, and integrity of its members and their ability to conduct research to high standards of scholarship and ethics. The research ethics clearance procedures have been established to ensure that the University is meeting its obligations as a responsible institution. They start from the presumption that all members of the University will take their responsibilities and obligations seriously and will ensure that their research on human subjects is conducted according to the established principles and good practice in their fields and in accordance, where appropriate, with legal requirements. Since the requirements of research ethics review will vary from field to field and from project to project, the University accepts that different guidelines and procedures will be appropriate. Please check the CUREC website to ensure that you have the correct form for your project.

This form does not cover research governance, satisfactory methodology, compliance with the requirements of publishers when administering their tests or questionnaires, or the health and safety of employees and students. As principal investigator, it is your responsibility to ensure that requirements in these areas are met. Please carry out a risk assessment of the project, in consultation with all researchers involved, using the checklist and CUREC's other documentation.

The use of an asterisk in this form indicates a phrase defined in the glossary. The glossary and further information on the University's research ethics procedures are available from the CUREC website:

www.admin.ox.ac.uk/curec

This form is designed largely for research that falls within the Divisions of Social Sciences and Humanities and which does not involve a high-level of risk to the subjects. Elite interviews, field work and oral history are included in the CUREC process. Please take a moment to read through it and if you have any questions or doubts as to whether it is the appropriate form, please review Section A or consult the CUREC website.

Note on anonymised data and audit: you do not need to obtain ethical approval for your study if:

- you are using previously collected **anonymised data** about people which neither you nor anyone else involved in your study can trace back to the individuals who provided them (e.g. census data, administrative data, secondary analysis). Please refer to the definition of *personal data in the glossary and FAQ no. 6 for further guidance; or
- you are conducting research on behalf of or at the request of a service provider that matches the definition of *audit in the glossary.

If your research is audit or uses prior-anonymised data, please check this box: ☐

You do not need to seek ethical approval from CUREC, and you do not need to complete any more of this form. However, please check with your department's requirements, as some departments require you to lodge this form with them.

Office use only: IDREC Ref. No. _____

Date of confirmation that checklist accepted on behalf of IDREC: // //

SECTION A	**Yes**	**No**
1) Are you using research methodologies commonly used in biomedical or behavioural laboratory sciences?		✓
2) Is there a significant risk that the research will induce anxiety, stress or other harmful psychological states in participants that might persist beyond the duration of any test or interview in which they are participating?		✓
3) Will the research involve human participants recruited by means of their status as present or past NHS patients or their relatives or carers or present or past NHS staff, or will the research, in whole or in part, be carried out on NHS premises, use NHS facilities or assess NHS facilities or services?		✓
4) Does the research involve *human participants aged 16 and over who do not have *capacity to consent for themselves? See the Mental Capacity Act 2005		✓
5) Is the study to be funded by the US National Institutes of Health or another US federal funding agency?		✓

If you answered 'yes', please stop work on this checklist and
for questions 1 and 2, complete CUREC/1 instead (available from www.admin.ox.ac.uk/curec);
for questions 3 and 4, submit your proposal to the appropriate NHS ethics committee (see www.nres.npsa.nhs.uk and www.admin.ox.ac.uk/rso/clinical for further information);
for question 5, or **if you answered 'yes' to questions 1, 2 or 4 and your research will take place outside the EU**, submit your proposal to OXTREC, which uses separate documentation (www.tropicalmedicine.ox.ac.uk/oxtrec).

If you have answered 'no' to all questions in Section A, please complete Sections B-E. This form and any supporting materials should be typewritten.

SECTION B

Principal investigator/ supervisor/student researcher (title and name):	***Ms Kai Ling Jessie Sim***
Name of supervisor (STUDENT RESEARCH PROJECTS ONLY):	***Professor Ken Mayhew***
Degree programme, e.g. DPhil, MPhil, MSc (STUDENT RESEARCH PROJECTS ONLY):	***DPhil***
Department or institute:	***Department of Education, 15 Norham Gardens, Oxford, OX2 6PY***
Address for correspondence (if different):	
Email and phone contact:	***kai.sim@ssho.ox.ac.uk*** ***07817205403***
Title of research project:	***Measuring and investigating the determinants of financial literacy: A study of students secondary schools in England***

Brief description of research methods and goals plus description of the nature of participants (including the criteria for inclusion/exclusion, method of recruitment), explanation of how professional guidelines and/or CUREC protocol(s) will be applied (if relevant) and expected use to which the results/data will be put. Please describe how you will obtain informed consent. Approx 400 words.

This study attempts to measure financial literacy in terms of knowledge and skills, using a specially designed test named the"Young People Financial Literacy Assessment". Also, in order to examine the relationship between financial literacy and its determinants, some questions will also be asked about the background and educational attainment of those taking the test. The questions will be compiled into a paper document and participants will be required to answer the questions by writing down the answers. The whole procedure should take about one hour and will be conducted for groups of students in a classroom.

The research participants will be Year 12 students who are at least 16 years old and have completed their GCSE exams in 2011. They will be recruited from 6th form schools and further education colleges in Oxfordshire.

A letter of invitation has been sent to eligible schools based within Oxfordshire. Schools who are willing to accommodate the research will indicate their interest by contacting the main researcher. After obtaining ethics clearance from the CUREC committee, the researcher will send the information sheets and consent forms to these schools. The schools will distribute these documents to the participants who will take them home for parents or guardians. The school then collates the number of students for whom consent has been given and makes further arrangements with the main researcher to be in the school premises to carry out the data collection.

The ethical considerations of this study follow closely the recommended guidelines of BERA (British Educational Research Association), ESRC (Economic & Social Research Council) and BSA (British Sociological Association). The protocol used is SSH/IDREC/2008/P13.1 for research methods that are non-invasive with children. An information sheet is provided to advise the participants and their parents about the purpose of the research and how the data will be collected. Consent is obtained from the parents using an opt-out form. The participant's consent to the study will also be obtained prior to the beginning of the test. Participants have the right to withdraw from the study anytime they wish. The data collected will be anonymised and only the researcher will have access to the research data

The information sheet and consent form given to the participants are attached in this application. Sample test questions and survey questions are also provided.

List actual or probable location(s) where project will be conducted, if known:	Sixth form schools and further education colleges in Oxfordshire
Anticipated duration of project:	9 months
Anticipated start date:	03/10/2011
Anticipated end date:	30/06/2012
Name and status (e.g. 3rd year undergraduate; post-doctoral research assistant) of others taking part in the project:	Nil
Please indicate what training on research ethics the researchers involved with this study have received, e.g. the title of the online or in-person course, and date completed (online training available at www.admin.ox.ac.uk/researchsupport/integrity/):	Masters of Education Educational Research Methodology (Completed in 2010)

SECTION C

Methods to be used in the study (**tick** as many as apply: this information will help the committee understand the nature of your research and may be used for audit).

	Please tick
Interview	
Questionnaire	✓
Analysis of existing records	
Participant performs verbal/paper and pencil/computer based task	✓
Measurement/recording of motor behaviour	
Audio recording of participant	
Video recording or photography of participant	
Physiological recording from participant	
Participant observation	
Covert observation	
Systematic observation	
Observation of specific organisational practices	

Other (please specify)	

SECTION D

Have you read one or more of the following professional guidelines and do you undertake to use the principles listed there as a guide for your own work? Please note that this is not intended to be an exhaustive list. Links to the guidelines listed below are included on the CUREC website.

	Please tick
British Society of Criminology: Code of Ethics for Researchers in the Field of Criminology [www.britsoccrim.org/codeofethics.htm]	
British Educational Research Association Ethical Guidelines for Educational Research [www.bera.ac.uk/publications/guidelines/]	✓
Academy of Management's Code of Ethics [www.aomonline.org]	
Association of American Geographers Statement on Professional Ethics [http://www.aag.org/cs/about_aag/resolutions/statement_on_professional_ethics_]	
Oral History Society of the UK Ethical Guidelines [www.oralhistory.org.uk/ethics/index.php]	
American Political Science Association (APSA) Guide to Professional Ethics in Political Science (Section H) [www.apsanet.org/content_9350.cfm]	
British Psychological Society Code of Ethics and Conduct [www.bps.org.uk/the-society/code-of-conduct/code-of-conduct_home.cfm]	✓
Ethics Guidelines of the Association of Social Anthropologists of the UK and Commonwealth [www.theasa.org/ethics/guidelines.shtml]	
Social Research Association: Ethical Guidelines [www.the-sra.org.uk/guidelines.htm]	✓
Statement of Principles of Ethical Research Practice from the Socio-Legal Studies Association [http://www.slsa.ac.uk/content/view/247/270/]	
Statement of Ethical Practice for the British Sociological Association [www.britsoc.co.uk/equality/Statement+Ethical+Practice.htm]	
Other professional guidelines (please specify):	

SECTION E

Please put a tick in the yes/no column as appropriate to indicate your response.

1) Will you obtain informed consent according to good practice in your discipline before participation?	**Yes**	**No**
	✓	
2) Will you ensure that *personal data collected directly from participants or via a *third party is held and processed in accordance with the provisions of the Data Protection Act?	**Yes**	**No**
	✓	
3) Does the research involve as participants *people whose ability to give free and informed consent is in question? (This includes those under 18 and vulnerable adults.)	**Yes**	**No**
	✓	
4) As a consequence of taking part in the research, will participants be at serious risk of rendering themselves liable to criminal prosecution (e.g. by providing information on drug abuse or child abuse)?	**Yes**	**No**
		✓
5) Does the research involve the *deception of participants, as part of the investigation/experiment?	**Yes**	**No**
		✓
If any of your answers above are in a shaded box, please indicate whether those aspects of your project are fully covered by the following.		
6) Research protocol(s) which has/ve received IDREC/CUREC approval?	**Yes**	**No**
If yes, please give protocol number(s): SSH/IDREC/2008/P13.1	✓	
7) Professional guidelines that you will be following, as noted under Section D?	**Yes**	**No**
	✓	

If any of your answers in Section E are in a shaded box and are not covered by a protocol or by professional guidelines, please complete CUREC/2, available to download from the CUREC website. Then submit both this form (you need not complete section F) and the CUREC/2 to the Social Sciences and Humanities IDREC.

If all your answers in Section E are in the unshaded boxes or your answers in shaded boxes are covered by a protocol or professional guidelines, complete Section F and submit this form and any accompanying documents to the Social Sciences and Humanities IDREC or to the relevant officer/committee at departmental level (see notes and address below).

FINAL CHECK

Please check each of the following before submitting the checklist. Failure to provide this information could delay the start of your research.

Have you completed Sections A-E? ☒

Have you defined all technical terms and abbreviations used? ☒

Have you included **all** supporting documentation that you will be using, including – as appropriate – questionnaires and participant information, consent forms/form or note of procedure for recording oral consent, advertisements and surveys to be used? ☒

Are all pages (including appendices and attachments) numbered? ☒

SECTION F

You can submit this checklist by email and/or as a signed hard copy; if it is being sent by email only, the checklist, and any email from the head of department or nominee separately endorsing its submission, must be sent from a University of Oxford email address (i.e. as a minimum, the checklist and supporting documents must be submitted by the head of department or nominee indicating his/her approval from a University of Oxford email account).

Complete this section only if you do not need to submit form CUREC/2.

I understand my responsibilities as principal researcher/supervisor/student researcher as outlined in the CUREC glossary and guidance on the CUREC website.

I declare that the answers above accurately describe my research as presently designed and that I will submit a new checklist should the design of my research change in a way which would alter any of the above responses so as to require completion of CUREC/2 (involving full scrutiny by an IDREC). I will inform the relevant IDREC if I cease to be the principal researcher on this project and supply the name and contact details of my successor if appropriate.

Signed by principal researcher/supervisor/student researcher: Kai Ling Jessie Sim

Date: 26 June 2011

Print name (block capitals) KAI LING JESSIE SIM

Signed by supervisor:……(for student projects)

Date:……

Print name (block capitals) KEN MAYHEW

I understand the questions and answers that have been entered above describing the research, and I will ensure that my practice in this research complies with these answers, subject to any modifications made by the principal researcher properly authorised by the CUREC system.

Signed by associate/other researcher: KAI LING JESSIE SIM

Print name (block capitals) KAI LING JESSIE SIM

Date 03 Oct 2011

I have read the research project application named above. On the basis of the information available to me, I:

(i) consider the principal researcher/supervisor/student researcher to be aware of her/his ethical responsibilities in regard to this research;

(ii) consider that any ethical issues raised have been satisfactorily resolved or are covered by relevant professional guidelines and/or CUREC approved protocols, and that it is appropriate for the research to proceed without further formal ethical scrutiny at this stage (noting the principal researcher's obligation to report should the design of the research change in a way which would alter any of the above responses so as to require completion of a CUREC/2 full application);

(iii) am satisfied that the proposed project has been/will be subject to appropriate *peer review and is likely to contribute something useful to existing knowledge and/or to the education and training of the researcher(s) and that it is in the *public interest.

(iv) [FOR DEPARTMENTS/FACULTIES WITH A DEPARTMENTAL RESEARCH ETHICS COMMITTEE (DREC) OR EQUIVALENT BODY - PLEASE DELETE IF NOT APPLICABLE] confirm that this checklist (and associated research outline) has been reviewed by the Department's Research Ethics Committee (DREC)/equivalent body, and attach the associated report from that body.

Signed:……..
(Head of department or nominee e.g Chair of DREC, Director of Graduate Studies for postgraduate student projects)

Print name (block capitals)……

Date:……

Please check with your department about its procedures for the approval of CUREC forms. If your department indicates that the checklist should be submitted directly to the IDREC, please send it, together with any supporting documentation, to the following address(es), keeping a copy for yourself:

Secretary of the Social Sciences and Humanities IDREC Email: ethics@socsci.ox.ac.uk
University of Oxford Social Sciences Division
Hayes House, George Street
Oxford, OX1 2BQ

IDRECs and/or CUREC will review a sample of completed checklists and may ask for further details of any project.

APPENDIX B Letter of invitation to schools

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor Ernesto Macaro

Dear Headteacher

We would like to invite the Year 10 students in your school to take part in a study which aims to measure children's financial literacy by means of a self-completed test. This exercise also includes obtaining some general background information from the test takers. The duration of the exercise is about 30 minutes. Participating students will receive a token reward for completing the test. This exercise forms an integral part of Jessie's PhD dissertation work. Professor Ken Mayhew is supervising Jessie's work.

Financial literacy refers to the skills, knowledge and attitudes involved in managing one's personal finances. In the UK's National Curriculum, financial literacy (or also referred to as financial capability) has been included into the draft National Curriculum for secondary level Mathematics and Citizenship. The UK Government and other OECD governments have expressed increasing concerns about lack of financial capability in the population as a whole and in young people in particular. Thus, we believe that this study has significant policy relevance and hopefully will help to provide guidance for financial education in the future.

For your information, we have attached an information sheet that will be sent to the parents of your students. On completion of the research, a summary report will be given to the school.

The test can be carried out any time before the end of this academic year. It can be administered during the class time set aside for Mathematics, Citizenship, PSHE or it can be included in activities for off timetable days, such as the "My Money Week" initiative led by pfeg (Personal Finance Education Group) which will be held from 3 to 9 June 2013. Participating schools will, of course, be given advance sight of the test.

If you would like to hear more details before making your decision, we would be delighted to provide them. We very much hope that your school will be able to participate and we look forward to hearing from you.

Yours sincerely,

Professor Ken Mayhew
Director, SKOPE
Department of Education
University of Oxford
ken.mayhew@education.ox.ac.uk

Jessie Sim
DPhil Candidate
Department of Education
University of Oxford
kai.sim@ssho.ox.ac.uk

APPENDIX C Information sheet for parents

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor Ernesto Macaro

Measuring financial literacy: a study of secondary school students

Information for participants and their parents

Your child's school has agreed to take part in a study which is about measuring financial literacy. I would like your child to be part of this study. It is important that you understand what the study is about and what it will involve.

What is the purpose and value of the study?

This study attempts to measure financial literacy by deploying a specially designed test. Analysis of the results from a number of schools will help us to understand the determinants of financial literacy. It is hoped that the study will inform and improve the current provision of financial education in UK schools.

What will happen if my child takes part?

Your child will be asked to complete a test of 25 questions. In addition, there will also be a small number of voluntary background questions about your child himself or herself-for example, gender and ethnicity. The test is anonymous; students will not be asked to reveal their identities. As an incentive, a small token reward will be given to every participating student.

What will happen to the results of this research?

Research data obtained from each child will be kept strictly confidential and anonymous. All the information and results will be kept securely in the Department of Education. Electronic copies of the research data will be password-protected and only accessed by the researcher and her supervisor. Summaries of the findings will be given to the school and will be available to interested families. All research data will be destroyed after the research is completed. **No child or school will be identified in the final report**.

Who is funding and conducting this research?

The research project is funded and conducted as an independent doctoral research project by Jessie Sim of Oxford University, who is a graduate student (Doctor of Philosophy in Education) under the supervision of Prof Ken Mayhew. This study has received ethics clearance through the University of Oxford's ethical approval process for research involving human participants.

What should I do next?

You do not have to do anything if you are willing to allow your child to participate in the study. However, if you do not wish your child to participate, you should return the opt-out form (enclosed). If you would like to discuss the research or if you have a concern about any aspect of this project, please call or send me an email. My contact details are:

Jessie Sim
University of Oxford
Department of Education
15 Norham Gardens
Oxford
United Kingdom
OX2 6PY

Tel: +447817205403
Email: kai.sim@ssho.ox.ac.uk

If you are unhappy about this approach and wish to make a formal complaint, please contact:

Dr Lars Malmberg,

Chair, Department of Education Research Ethics Committee.

Telephone: +441865 274047

E-mail: lars-erik.malmberg@education.ox.ac.uk

APPENDIX D Opt-out form

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor Ernesto Macaro

Measuring financial literacy: a study of secondary school students

Dear Parent,

I hope your child will participate in the study described in the information letter. The purpose of this study is to measure children's financial literacy. It is hoped that the results will inform and improve the current provision of financial education in UK schools.

Your child does not have to do any additional preparation for this test.

Your child's school has given permission for the study to be carried out in the school during school hours. If you do not want your child to participate, he or she will be withdrawn. If you wish to withdraw your child, please complete the opt-out form below and return this letter to your child's teacher. If the school does not hear from you within 10 days of your receipt of this letter, I will include your child along with the many others participating in the study.

Thank you very much for your time,

Jessie Sim (Research Student) Prof Ken Mayhew (Research Supervisor)

I, the undersigned, hereby <u>DO NOT</u> give permission for my child to take part in the above study.

Name of child: _____Class:_____

Name of parent/guardian: _____

Signature: _____

Date:_____

Name of researcher:Jessie Sim

APPENDIX E Instructions for teachers

Dear Teachers,

Thank you very much for helping me to administer the financial literacy test.

The students will attempt all questions on their own. Instructions have been printed on the cover page.

After all students have received a copy of the question and answer booklet, please read the following instructions to them.

"You have received a question booklet and an answer booklet. Please begin by answering all the questions in the question booklet. You may use a calculator if you need to. When you have finished these questions, please go on to the rest of the survey questions from pages 2 to 4 in the answer booklet.

Please answer as many questions as you can. If you do not know the answer or do not wish to answer some questions, it is fine to leave them blank.

When you have finished, please return both the question and answer booklets back to me.

Thank you for participating in the research."

Thank you for your help. Much appreciated.

Jessie Sim

APPENDIX F Item bank

Domain 1: money and transactions

Test Item Code	Question (answers in bold)	Source (if adapted)
MT1	Which symbol represents the **Euro**? E. £ **F. €** G. $ H. ¥	IFS
MT2	If Jenny uses her debit card to pay for purchases that cost £500 in total but she only has £450 in her current account. This would be an example of _____. A. getting a credit check B. making a bank transfer **C. using an overdraft facility** D. using a direct debit facility	
MT3	What does the bank pay you for holding your savings? E. profit **F. interest** G. dividend H. premium	
MT4	Kumar used his credit card to buy a shirt at The Shirt Shop for £20. As a result of this transaction, the credit card company will _____. **A. lend Kumar £20** B. lend The Shirt Shop £20 C. add £20 to Kumar's bank account D. deduct £20 from Kumar's bank account	Council for Economic Education (2005)

Test Item Code	Question (answers in bold)	Source (if adapted)
MT5	Calculate the amount of pounds sterling (£) needed to buy US$100, based on the following exchange rate. ***£1 = US$ 1.60*** **A. £62.50** B. £82.50 C. £160.00 D. £625.00	
MT6	Ann has a current account which comes with a debit card and cheque book. Exhibit A shows her bank statement for the month of May 2012. Based on the bank statement, calculate the total amount that Ann **spent** in May 2012. A. £325 **B. £675** C. £715 D. £755	
MT7	Exhibit B shows the prices of watching movies at Concord Cinemas. Pam is a 16 year-old student. She is a Concord Club member. She wants to watch the movie "The Trip". She can watch the movie at any of the following screening dates and times listed below. Which of the following options will be the **cheapest** for her? A. 6th August 2012, Monday, 5.20pm **B. 7th August 2012, Tuesday, 5.20pm** C. 9th August 2012, Thursday, 4.30pm **D.** 12th August 2012, Sunday, 4.30pm	

Exhibit A

Ann's bank statement for May 2012

SERENITY BANK

Current Account Statement 31 May 2012

Ann Woods
10 High Street
London
SW1B 2AB Sort code: 37-14-38 Account number: 19740378

Date	Description	Credit (£)	Debit (£)	Balance (£)
1 May	Beginning Balance			850
2 May	Monthly Bus Pass		45	805
5 May	Paul's Supermarket		50	755
15 May	Direct debit: Utilities Bill		100	655
16 May	Cheque: rent for May		400	255
18 May	Liberty Store purchase		60	195
20 May	Salary	1000		1195
21 May	Paul's Supermarket		60	1135
25 May	Refund: Liberty Store	40		1175
31 May	Statement closing balance			1175

Useful Information

Checking your statements

Please read through the entries on your statement. If you think something is incorrect, please contact us straight away on 0845 6 000 000 and we will check it for you. The earlier you contact us regarding a disputed entry, the more we may be able to do. Take care when storing or disposing of information about your account.

Interest rates

You can find out the interest rates that we have used to calculate any interest you have earned or been paid by clicking 'Find out more about our interest rates and charges' link under your online statement, by visiting www.serenitybank.com or your local branch by calling our interest rate line on 0845 600 9988 (8am-9pm Monday-Friday and 9am-5pm Saturday-Sunday)

Personal Debit and Cashpoint® Card Charges

Whenever you use your card to withdraw cash or make a payment in currencies other than in sterling, the amount is converted to sterling on the day it is processed by Visa, using their standard exchange rate that day. We also include a foreign exchange fee of 2.99%. Please check our Banking Charges guide, visit www.serenitybank.com, call us on 0845 6 000 000 or visit any Serenity Bank Branch for the other charges that apply.

Exhibit B

CONCORD CINEMA PRICE LIST

TICKET PRICES	SUPER SAVER Monday to Thursday before 5pm	PEAK Monday to Thursday from 5pm, All day on Friday, Saturday and Sunday
Child (Ages 12 and below)	£5.50	£6.50
Teen (Ages 13 to 17)	£6.00	£7.00
Student (valid student card required)	£6.50	£7.50
Adult (Ages 18+)	£8.00	£9.50
Concord Tuesday	20% off all listed prices (including Super Saver) on Tuesdays for Concord Club members	

Test Item Code	Question (answers in bold)	Source (if adapted)
MT8	You put £500 into a savings account at the beginning of the year and had £512.50 in the account at the end of the year. Calculate the annual interest rate. E. 1.0% F. 2.0% G. 1.5% **H. 2.5%**	
MT9	In which of the following situations is it **<u>most likely</u>** that bank charges will be incurred? A. Gemma uses a credit card for all her purchases and she pays the credit card bill in full before the due payment date. B. Sheema has a basic bank account with a cash withdrawal card and no overdraft facility. She can only buy something when there is money in her account. C. Jim's salary is credited into his bank account every month and his bills (which are never more than his salary) are paid on the same day using direct debits. **D. Tim is holidaying in France and he has run out of cash. He uses his credit card to get some money from a cash withdrawal machine.**	

Test Item Code	Question (answers in bold)	Source (if adapted)
MT10	Which of the following statements are true about the advantages of having bank accounts? V. Bank accounts help you save money. VI. Bank accounts keep your money safe. VII. Bank accounts help you to pay your bills. VIII. Bank accounts help you to receive your salary and benefits. E. I F. I and II G. I, II and III **H. I, II, III and IV**	
MT11	Which of the following statements is **NOT** correct about the use of most ATM (Automated Teller Machine) cards? A. You must have a bank account in order to have and use an ATM card. B. You can generally use an ATM card to get cash from a cash machine at any time of the day. C. There is a limit to the amount of cash you can withdraw from cash machines per day, with an ATM card. **D. You can use ATM cards to withdraw cash from any cash machine in the world without paying extra fees.**	

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source
(if adapted)</th></tr>
<tr><td>MT12</td><td>You need to buy 12 loo rolls. Which of the following promotions for the same type of product will give you the best buy?
<table><tr><td>(A)
A pack of 12 rolls for £4.80</td><td>(B)
A pack of 4 rolls for £3
Special offer: 3 Packs for the price of 2</td></tr><tr><td>(C)
A Pack of 3 rolls for £1.80
Special offer: Save 10% off this price</td><td>(D)
A Pack of 6 rolls for £7.20
Special Offer: Buy 1 pack, get 1 pack free</td></tr></table></td><td>Personal Finance Education Group (2010a)</td></tr>
<tr><td>MT13</td><td>The following payment methods are accepted in most retail stores. Which of the following payment methods enable you to buy something now and pay for it later?
A. debit card
B. credit card
C. prepaid card
D. gift vouchers</td><td></td></tr>
<tr><td>MT14</td><td>Nadia opens a savings account and deposits £500. She does not make any additional deposits for 2 years. If the account has a fixed annual compound interest rate of 5%, how much will Nadia have in her savings account at the end of two years?
A. £510.25
B. £525.25
C. £550.25
D. £551.25</td><td>Council for Economic Education (2005)</td></tr>
</table>

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source
(if adapted)</th></tr>
<tr><td>MT15</td><td>
Stationery Palace (www.stationerypalace.co.uk) is having an online sales promotion which gives 10% discount on all stationery and Yang has decided to make a purchase of 10 refill pads. The figure below shows her shopping cart at the check-out page on the website. Some numbers have been left out on purpose.
<table>
<tr><th>Item</th><th>Price</th><th>Quantity</th><th>Subtotal</th></tr>
<tr><td>Refill pad

(A pack of 5 refill pads, 160 pages each)</td><td>£6.90</td><td>2</td><td>£13.80</td></tr>
<tr><td colspan="3">Discount 10%</td><td>?</td></tr>
<tr><td colspan="3">Delivery</td><td>?</td></tr>
<tr><td colspan="3">Final Total</td><td>?</td></tr>
</table>
<u>Below is an extract from the website about delivery charges</u>
“Delivery is free of charge on orders of £30 or more. Below this figure, a charge of £2.50 is applied to orders with a value of £5 to £29.99 and a charge of £3.50 is applied to orders of £4.99 or less.”

How much will Yang have to pay for the purchase in total?

A. £12.42
B. £14.92
C. £15.92
D. £16.30
</td><td></td></tr>
</table>

Test Item Code	Question (answers in bold)	Source (if adapted)
MT16	Nadiah received her credit card statement and found that someone has used her card to make a purchase on an internet website. She was certain that she has been very careful about keeping her card details safe. Based on the terms and conditions of the credit card in Exhibit C, which of the following statements are **TRUE**? V. Nadiah must contact the bank immediately to report the fraudulent use of her card. VI. Since it was not her fault, the bank will not make her pay for **all** the purchases she made that month. VII. Even though Nadiah did not make the fraudulent transaction, she must pay for at least half of it since she is the account holder. VIII. Nadiah would not have to pay for any transaction which she did not authorise. E. I F. I and II **G. I and IV** H. I, II, III and IV	

Exhibit C

THE ROYAL BANK

GENERAL CREDIT CARD CONDITIONS

1. THE CARD, PIN AND CHEQUES

1.1 You must:

- follow instructions we give you, which we reasonably consider are needed to protect you and us from unauthorised use of your Card or Security Details;
- not use your Card for anything illegal or for any business purpose;
- only use your Card during the valid period on the Card;
- not let anyone else use your Card, Cheques or Security Details;
- keep your Card and Cheques secure and protect them from damage;
- do all you reasonably can to make sure no one finds our your Security Details, for example by not:
  -choosing an obvious PIN;
  -writing your Security Details on (or keeping them with) your Card or banking documentation;
  -writing your Security Details down in a way that is recognisable; or
  -letting anyone listen in to your calls with us, or watch you entering or making use of your Security Details; and
- if there is a place for signature, sign your Card as soon as you have received it.

2. LOST CARDS

2.1 You must contact us urgently if a Card or Cheque is lost or stolen or a Card or your Security Details are misused (or you think they might be). Our address and telephone numbers are: Our address and telephone numbers are: Royal Bank Card Services, 1 High Street, Reading, RG 1 9AX; phone (24hours) 0800 298 4738, +44 1702 298 548 abroad. We will keep a record of your call, and may record or monitor the call itself. If you later find the reported Cards or Cheques, you must destroy them.

2.2 You will not have to pay us anything for unauthorised use of your account unless we can show that you gave someone your Card (or Security Details to make Transactions), or were fraudulent. In this case, you will be liable for all use of the Card before you give us notice under the above condition.

2.3 You will not have to pay us for unauthorised postal, telephone or internet Transactions made by someone other than you or an additional cardholder.

2.4 You must give any information and help we reasonably ask for to deal with misuse or unauthorised access to your account, or in relation to any other transaction we, the police or other authorities are investigating. We may pass on related information to other banks, to those involved in processing card payments, or to the police or other authorities, in the UK or (if appropriate) abroad.

Domain 1: planning and managing finances

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source
(if adapted)</th></tr>
<tr><td>PMF1</td><td>There are four different job advertisements below. Which job shows that the worker will receive income from <u>commission</u> only?
<table><tr><td>(A)
Flower Seller for Valentine’s Day
Flexible working hours
You will be paid 30% of total sales.</td><td>(B)
Temporary office worker needed
20 hours per week over 4 weekdays
£7 per hour</td></tr><tr><td>(C)
Cleaner needed
Two days a week, 3h each day
£6.19 per hour
(weekend work at time and a half)</td><td>(D)
Paper round
£7 per round per day
plus 5p per newspaper delivered.</td></tr></table></td><td></td></tr>
<tr><td>PMF2</td><td>Sandy is paid £6.80 per hour for a 40 hour work week. Overtime is paid at double time (twice the normal hourly rate). How much will she be paid for a full week’s work plus 2 hours overtime?
A. £272.00
B. £278.80
C. £285.60
D. £299.20</td><td></td></tr>
</table>

Test Item Code	Question (answers in bold)	Source (if adapted)
PMF3A	Which of the following statements about the UK National Insurance (NI) is/are true? V. Most people who work have to pay NI. VI. Everyone pays the same amount of NI. VII. If you pay NI, you normally have to pay income tax as well. VIII. Paying NI helps the government to provide state benefits such as Jobseeker's allowance. E. I F. I and II **G. I, II and IV** H. I, III and IV	
PMF3B	Esther works full-time as a shop assistant. Who pays the National Insurance contributions on Esther's wages? **E. Esther** F. Esther's employer G. The UK government H. Esther and her employer	
PMF4	Scott and Eric are young men. Each has a good credit history. They work at the same company and earn the same salary. Scott has borrowed £6,000 to pay for a luxury holiday. Eric has borrowed £6,000 to buy a car. Who is likely to pay the lower finance charge? E. They will both pay the same because the rate is fixed. **F. Eric will pay less because the car is collateral for the loan.** G. Scott will pay less because people who travel overseas are likely to repay their loans. H. They will both pay the same because they have almost identical financial backgrounds.	Mandell (2009a)

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source
(if adapted)</th></tr>
<tr><td>PMF5</td><td>The figure below shows Ms Penny's most recent payslip.
Use it to answer Questions (a) and (b)

<table>
<tr><td>Name</td><td>National Insurance number</td><td>Pay Date</td><td>Tax Code</td></tr>
<tr><td>Ms Penny</td><td>SL 49 78 56 B</td><td>25 Oct 2012</td><td>BR</td></tr>
<tr><td colspan="2">Payments</td><td colspan="2">Deductions</td></tr>
<tr><td>Description</td><td>Amount</td><td>Description</td><td>Amount</td></tr>
<tr><td>Gross Pay
Overtime</td><td>£2000
£100</td><td>PAYE Tax
Student Loan
National Insurance
Company Pension</td><td>£410
£30
£200
£130</td></tr>
<tr><td>Total Gross Pay</td><td>£2100</td><td>Total Deductions</td><td>£770</td></tr>
<tr><td></td><td></td><td>Net Pay</td><td>£1330</td></tr>
</table>

(a) How much did Ms Penny bring home on 25 Oct 2012?

A. £1230
B. £1330
C. £2100
D. £2870</td><td></td></tr>
<tr><td>PMF6</td><td>(b) Which of the following deduction(s) in the payslip above contribute to state benefits in the UK?

E. PAYE Tax
F. Company Pension
G. National Insurance
H. National Insurance and PAYE Tax</td><td></td></tr>
</table>

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source (if adapted)</th></tr>
<tr><td>PMF7</td><td>
The Smith family takes home £3000 in earnings and spends about £3500 each month (see table below).

Mr Smith uses their car to drive to work in another town as well as to drop off and pick up his 2 children at their primary school.

Mrs Smith works as a full-time bank cashier at a local bank.

Which is the best action they can take to balance their budget?

<table>
<tr><th>Description</th><th>Outgoing (£)</th></tr>
<tr><td>Clothing</td><td>300</td></tr>
<tr><td>Groceries</td><td>600</td></tr>
<tr><td>Petrol for car</td><td>250</td></tr>
<tr><td>Other travel expenses</td><td>100</td></tr>
<tr><td>House Mortgage</td><td>800</td></tr>
<tr><td>Golf Club membership</td><td>200</td></tr>
<tr><td>School related expenses (books, stationery, uniforms etc.)</td><td>100</td></tr>
<tr><td>Gas, electricity, phone and internet bills</td><td>300</td></tr>
<tr><td>Eating out at restaurants</td><td>300</td></tr>
<tr><td>Car loan</td><td>300</td></tr>
<tr><td>Family activities (cinema, bowling, camping)</td><td>250</td></tr>
<tr><td>Total</td><td>3500</td></tr>
</table>
A. Sell the car.
B. Reduce clothing and school related expenses.
C. Reduce school related and family activities expenses.
D. Cancel the golf club membership and reduce eating out expenses.
</td><td></td></tr>
</table>

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source (if adapted)</th></tr>
<tr><td>PMF8</td><td>Which of the following actions is <u>not</u> likely to result in more personal savings?

A. Cycling to work instead of driving a car.

B. Buying daily essential items in bulk when prices are low.

C. Using a store discount coupon to buy something you did not plan to get.

D. Comparing the prices of different mobile phone plans before taking up a new phone contract.</td><td></td></tr>
<tr><td>PMF9</td><td>What is the main advantage about keeping your money in ISAs (Individual Savings Accounts)?

E. You can earn a higher interest rate.
F. The interest earned on an ISA is tax-free.
G. You cannot withdraw your money for at least a year.
H. You can deposit as much money as you like into an ISA.</td><td></td></tr>
<tr><td>PMF10</td><td>Abdul brings home £1800 per month by being in employment. His monthly expenses are:

<table><tr><td>Rent</td><td>£800</td></tr><tr><td>Groceries</td><td>£200</td></tr><tr><td>Transportation</td><td>£150</td></tr><tr><td>Utilities and gas bills</td><td>£200</td></tr><tr><td>Entertainment</td><td>£200</td></tr></table>
At least how many months would it take him to save for a holiday that costs £1000?

A. 2 months

B. 3 months

C. 4 months

D. 6 months</td><td>IFS</td></tr>
</table>

Test Item Code	Question (answers in bold)	Source (if adapted)
PMF11	Tom and Mary are of the same age and have the same type of savings account that earns an annual interest of 5% per year. Mary started saving £2000 a year at the age of 20 while Tom saved nothing. At the age of 50, Tom started saving £4000 a year. Who will have the **MOST** money in their account at the age of 75? A. Both would have the same amount of money. B. Mary, because she saved more money overall. C. Tom, because he saved more than Mary per year. **D. Mary, because her money has compounded over a longer time.**	Mandell (2009a)
PMF12	Which of the following credit card users is likely to pay the **GREATEST** amount of finance charges per year if they spend the same amount per year on their credit cards? **A. Ali, who always pays just the minimum amount each month.** B. Ben, who always pays off the credit card bill in full shortly after receiving it. C. Caleb, who pays at least the minimum amount each month and more when he has the money. D. Denise, who usually pays off her credit card bill in full but on some occasions, will pay just the minimum amount.	Mandell (2009a)

Test Item Code	Question (answers in bold)	Source (if adapted)
PMF13	If you are behind on your debt payments and you go to a credit counselling service such as the Citizens Advice Bureau, how are they most likely able to help you? E. They can lend you more money to pay off your debts. F. They can cancel all your credit cards without your permission. G. They will ask the government for money to help you with your debts. **H. They will work with your debtors to set up a payment schedule that is reasonable for you to meet.**	Mandell (2009a)
PMF14	Taxes are used to pay for many things, including _____. A. taxi services B. store decorations **C. salaries of policemen** D. salaries of fruit pickers	

Test Item Code	Question (answers in bold)	Source (if adapted)
PMF15	How are local services like refuse collection funded? E. Income Tax **F. Council Tax** G. National Insurance H. VAT (Value-Added Tax)	
PMF16	Under which of the following circumstances would it be most financially beneficial for you to borrow money to buy something now and repay with future income? A. When some clothes you like go on sale. **B. When you need to buy a car to get a much better paying job.** C. When you want to replace the old garden furniture with new ones. D. When the interest on the loan is greater than the interest you get on your savings.	Mandell (2009a)

Domain 3: financial risk and reward

Test Item Code	Question (answers in bold)	Source (if adapted)
FRR1	What is the general relationship between risk and potential reward with regards to financial investments? E. The higher the risk, the lower the potential reward. **F. The higher the risk, the greater the potential reward.** G. The amount of risk does not influence potential reward. H. There is no general relationship between risk and potential reward.	Council for Economic Education (2005)
FRR2	An increase in the price of goods and services in an economy is known as _____. **A. inflation** B. deflation C. recession D. depression	

Test Item Code	Question (answers in bold)	Source (if adapted)
FRR3A	Jessica has decided to spend more on car insurance this year than last year. She has probably decided that _____. E. The added insurance will help her save more money. **F. The benefits of more insurance are greater than the costs.** G. Buying more insurance will reduce the risk of an accident. H. She will drive less safely during the coverage of the insurance.	Council for Economic Education (2005)
FRR3B	Which of the following general statements about insurance is true? V. It is a form of financial protection against a certain life event which could happen. VI. Motor insurance is compulsory if you drive a vehicle. VII. The insurer bears the financial risk when they agree to insure you. VIII. You can get a refund on your insurance if nothing happens to you. E. I F. I and II **G. I,II and III** H. I, II, III and IV	

<table>
<tr><th>Test Item Code</th><th>Question (answers in bold)</th><th>Source (if adapted)</th></tr>
<tr><td>FRR4</td><td>
Mandy bought travel insurance to insure herself during her holiday overseas. While on holiday, she lost £300 to pickpockets.

Below shows part of the travel insurance policy schedule.

<table>
<tr><th>Description</th><th>Limit</th><th>Excess</th></tr>
<tr><td>Loss of cash</td><td>£250</td><td>£20</td></tr>
<tr><td>Loss of documents</td><td>£250</td><td>£50</td></tr>
</table>

Covered

You are covered up to the amount specified on your policy schedule for accidental loss or theft of your own cash and/or documents. Cash is only covered whilst being carried on yourself or left in a locked safety deposit box.

Not Covered

4. The policy excess as specified on your insurance schedule.
5. If you do not exercise reasonable care in protecting your cash and documents against loss, theft or damage.
6. If you do not obtain a written police report within 48 hours of the discovery in the event of loss, burglary or theft of cash and/or documents.

If Mandy’s claim was successful, how much will the insurance company pay her?

E. £230
F. £250
G. £270
H. £300
</td><td></td></tr>
</table>

Test Item Code	Question (answers in bold)	Source (if adapted)
FRR5	If you are a shareholder in a company, you _____. A. will get dividends every year. B. are insured on your investment. **C. have partial ownership in the company.** D. will get interest on your investment every year.	Council for Economic Education (2005)
FRR6	What are two main ways that an investor can get a return from keeping shares in a listed company? E. Dividends and tax credits. F. Dividends and interest from the stock. **G. Dividends and an increase in the price of the stock.** H. Tax credits and an increase in the price of the stock.	Council for Economic Education (2005)

Test Item Code	Question (answers in bold)	Source (if adapted)
FRR7	Vinoth has £5,000 to invest. He is a safe investor and wants to avoid risky investments. Which of the following should he choose? A. Foreign currencies B. Shares in a listed company **C. Fixed interest rates deposit accounts** D. Shares in a private start-up company	
FRR8	Last year, Barry's motorbike was insured by the ANGSANA insurance company. The insurance policy covered damage to the motorbike and theft of the motorbike. Barry plans to renew his insurance with ANGSANA this year. Which of the following factors are likely to increase the cost of his motorbike insurance? V. Barry painted his motorbike. VI. Barry had two road accidents last year. VII. Barry changed the lock on his motorbike. VIII. Barry changed his motorbike's engine with a more powerful one. E) I and IV **F) II and IV** G) III and IV H) II, III and IV	OECD (2012)

APPENDIX G Pilot question booklet

FINANCIAL LITERACY ASSESSMENT FOR YOUNG PEOPLE

Instructions

1. There are 30 questions and 14 printed pages in this question booklet.
2. You will be given a separate answer booklet.
3. For each question, there are four possible choices.
4. Select the answer you think is correct and circle the appropriate letter A, B, C or D in the answer booklet.
5. You may use a calculator.
6. You may write in the question booklet.
7. When you have finished these 30 questions, please complete the survey questions at the end of the answer booklet.

THANK YOU FOR PARTICIPATING

No.	Question
1	If Jenny uses her debit card to pay for purchases that cost £500 in total but she only has £450 in her current account. This would be an example of _____. A. getting a credit check B. making a bank transfer C. using an overdraft facility D. using a direct debit facility
2	Kumar used his credit card to buy a shirt at The Shirt Shop for £20. As a result of this transaction, the credit card company will _____. A. lend Kumar £20 B. lend The Shirt Shop £20 C. add £20 to Kumar's bank account D. deduct £20 from Kumar's bank account
3	Calculate the amount of pounds sterling (£) needed to buy US$100, based on the following exchange rate. ***£1 = US$ 1.60*** A. £62.50 B. £82.50 C. £160.00 D. £625.00
4	Ann has a current account which comes with a debit card and cheque book. Exhibit A (page 3) shows her bank statement for the month of May 2012. Based on the bank statement, calculate the total amount that Ann **spent** in May 2012. E. £325 F. £675 G. £715 H. £755

Exhibit A

Ann's bank statement for May 2012

SERENITY BANK

Current Account Statement 31 May 2012

Ann Woods
10 High Street
London
SW1B 2AB Sort code: 37-14-38 Account number: 19740378

Date	Description	Credit (£)	Debit (£)	Balance (£)
1 May	Beginning Balance			850
2 May	Monthly Bus Pass		45	805
5 May	Paul's Supermarket		50	755
15 May	Direct debit: Utilities Bill		100	655
16 May	Cheque: rent for May		400	255
18 May	Liberty Store purchase		60	195
20 May	Salary	1000		1195
21 May	Paul's Supermarket		60	1135
25 May	Refund: Liberty Store	40		1175
31 May	Statement closing balance			1175

Useful Information

Checking your statements

Please read through the entries on your statement. If you think something is incorrect, please contact us straight away on 0845 6 000 000 and we will check it for you. The earlier you contact us regarding a disputed entry, the more we may be able to do. Take care when storing or disposing of information about your account.

Interest rates

You can find out the interest rates that we have used to calculate any interest you have earned or been paid by clicking 'Find out more about our interest rates and charges' link under your online statement, by visiting www.serenitybank.com or your local branch by calling our interest rate line on 0845 600 9988 (8am-9pm Monday-Friday and 9am-5pm Saturday-Sunday)

Personal Debit and Cashpoint® Card Charges

Whenever you use your card to withdraw cash or make a payment in currencies other than in sterling, the amount is converted to sterling on the day it is processed by Visa, using their standard exchange rate that day. We also include a foreign exchange fee of 2.99%. Please check our Banking Charges guide, visit www.serenitybank.com, call us on 0845 6 000 000 or visit any Serenity Bank Branch for the other charges that apply.

(Please Turn Over)

No.	Question
5	Exhibit B (page 5) shows the prices of watching movies at Concord Cinemas. Pam is a 16 year-old student. She is a Concord Club member. She wants to watch the movie "The Trip". She can watch the movie at any of the following screening dates and times listed below. Which of the following options will be the **cheapest** for her? A. 6th August 2012, Monday, 5.20pm B. 7th August 2012, Tuesday, 5.20pm C. 9th August 2012, Thursday, 4.30pm D. 12th August 2012, Sunday, 4.30pm
6	You put £500 into a savings account at the beginning of the year and had £512.50 in the account at the end of the year. Calculate the annual interest rate. A. 1.0% B. 1.5% C. 2.0% D. 2.5%
7	In which of the following situations is it **most likely** that bank charges will be incurred? A. Gemma uses a credit card for all her purchases and she pays the credit card bill in full before the due payment date. B. Sheema has a basic bank account with a cash withdrawal card and no overdraft facility. She can only buy something when there is money in her account. C. Jim's salary is credited into his bank account every month and his bills (which are never more than his salary) are paid on the same day using direct debits. D. Tim is holidaying in France and he has run out of cash. He uses his credit card to get some money from a cash withdrawal machine.

Exhibit B

CONCORD CINEMA PRICE LIST

TICKET PRICES	SUPER SAVER Monday to Thursday before 5pm	PEAK Monday to Thursday from 5pm, All day on Friday, Saturday and Sunday
Child (Ages 12 and below)	£5.50	£6.50
Teen (Ages 13 to 17)	£6.00	£7.00
Student (valid student card required)	£6.50	£7.50
Adult (Ages 18+)	£8.00	£9.50
Concord Tuesday	20% off all listed prices (including Super Saver) on Tuesdays for Concord Club members	

(Please Turn Over)

<table>
<tr><th>No.</th><th>Question</th></tr>
<tr><td>8</td><td>Which of the following statements is <u>NOT</u> correct about the use of most ATM (Automated Teller Machine) cards?

A. You must have a bank account in order to have and use an ATM card.

B. You can generally use an ATM card to get cash from a cash machine at any time of the day.

C. There is a limit to the amount of cash you can withdraw from cash machines per day, with an ATM card.

D. You can use ATM cards to withdraw cash from any cash machine in the world without paying extra fees.</td></tr>
<tr><td>9</td><td>You need to buy 12 loo rolls. Which of the following promotions for the same type of product will give you the best buy?

<table><tr><td>(A)
A pack of 12 rolls for £4.80</td><td>(B)
A pack of 4 rolls for £3
Special offer: 3 Packs for the price of 2</td></tr><tr><td>(C)
A Pack of 3 rolls for £1.80
Special offer: Save 10% off this price</td><td>(D)
A Pack of 6 rolls for £7.20
Special Offer: Buy 1 pack, get 1 pack free</td></tr></table></td></tr>
<tr><td>10</td><td>The following payment methods are accepted in most retail stores. Which of the following payment methods enable you to buy something now and pay for it later?

A. debit card
B. credit card
C. prepaid card
D. gift vouchers</td></tr>
</table>

No.	Question
11	Stationery Palace (www.stationerypalace.co.uk) is having an online sales promotion which gives **10% discount** on all stationery and Yang has decided to make a purchase of **10** refill pads. The figure below shows her shopping cart at the check-out page on the website. Some numbers have been left out on purpose.

Item	Price	Quantity	Subtotal
Refill pad (A pack of 5 refill pads, 160 pages each)	£6.90	2	£13.80
		Discount 10%	?
		Delivery	?
		Final Total	?

Below is an extract from the website about delivery charges

"Delivery is free of charge on orders of £30 or more. Below this figure, a charge of £2.50 is applied to orders with a value of £5 to £29.99 and a charge of £3.50 is applied to orders of £4.99 or less."

How much will Yang have to pay for the purchase in total?

A. £12.42

B. £14.92

C. £15.92

D. £16.30

12 Nadia opens a savings account and deposits £500. She does not make any additional deposits for 2 years. If the account has a fixed annual compound interest rate of 5%, how much will Nadia have in her savings account at the end of two years?

A. £510.25

B. £525.25

C. £550.25

D. £551.25

(Please Turn Over)

No.	Question
13	There are four different job advertisements below. Which job shows that the worker will receive income from <u>commission</u> only? (A) *Flower Seller for Valentine's Day* Flexible working hours You will be paid 30% of total sales. (B) *Temporary office worker needed* 20 hours per week over 4 weekdays £7 per hour (C) *Cleaner needed* Two days a week, 3h each day £6.19 per hour (weekend work at time and a half) (D) *Paper round* £7 per round per day plus 5p per newspaper delivered.
14	Sandy is paid £6.80 per hour for a 40 hour work week. Overtime is paid at **double time (twice the normal hourly rate)**. How much will she be paid for a full week's work plus 2 hours overtime? A. £272.00 B. £278.80 C. £285.60 D. £299.20
15	Scott and Eric are young men. Each has a good credit history. They work at the same company and earn the same salary. Scott has borrowed £6,000 to pay for a luxury holiday. Eric has borrowed £6,000 to buy a car. Who is likely to pay the lower finance charge? A. They will both pay the same because the rate is fixed. B. Eric will pay less because the car is collateral for the loan. C. Scott will pay less because people who travel overseas are likely to repay their loans. D. They will both pay the same because they have almost identical financial backgrounds.

The figure below shows Ms Penny's most recent payslip.
Use it to answer Questions 16 and 17.

Name	National Insurance number	Pay Date	Tax Code
Ms Penny	SL 49 78 56 B	25 Oct 2012	BR
Payments		**Deductions**	
Description	**Amount**	**Description**	**Amount**
Gross Pay	£2000	PAYE Tax	£410
Overtime	£100	Student Loan	£30
		National Insurance	£200
		Company Pension	£130
Total Gross Pay	£2100	**Total Deductions**	£770
		Net Pay	£1330

No.	Question
16	How much did Ms Penny bring home on 25 Oct 2012? A. £1230 B. £1330 C. £2100 D. £2870
17	Which of the following deduction(s) in the payslip above contribute to state benefits in the UK? A. PAYE Tax B. Company Pension C. National Insurance D. National Insurance and PAYE Tax

(Please Turn Over)

<table>
<tr><th>No.</th><th>Question</th></tr>
<tr><td>18</td><td>The Smith family takes home £3000 in earnings and spends about £3500 each month (see table below).

Mr Smith uses their car to drive to work in another town as well as to drop off and pick up his 2 children at their primary school.

Mrs Smith works as a full-time bank cashier at a local bank.

Which is the best action they can take to balance their budget?

<table>
<tr><th>Description</th><th>Outgoing (£)</th></tr>
<tr><td>Clothing</td><td>300</td></tr>
<tr><td>Groceries</td><td>600</td></tr>
<tr><td>Petrol for car</td><td>250</td></tr>
<tr><td>Other travel expenses</td><td>100</td></tr>
<tr><td>House Mortgage</td><td>800</td></tr>
<tr><td>Golf Club membership</td><td>200</td></tr>
<tr><td>School related expenses (books, stationery, uniforms etc.)</td><td>100</td></tr>
<tr><td>Gas, electricity, phone and internet bills</td><td>300</td></tr>
<tr><td>Eating out at restaurants</td><td>300</td></tr>
<tr><td>Car loan</td><td>300</td></tr>
<tr><td>Family activities (cinema, bowling, camping)</td><td>250</td></tr>
<tr><td>Total</td><td>3500</td></tr>
</table>
A. Sell the car.
B. Reduce clothing and school related expenses.
C. Reduce school related and family activities expenses.
D. Cancel the golf club membership and reduce eating out expenses.</td></tr>
<tr><td>19</td><td>Which of the following actions is <u>not</u> likely to result in more personal savings?

A. Cycling to work instead of driving a car.

B. Buying daily essential items in bulk when prices are low.

C. Using a store discount coupon to buy something you did not plan to get.

D. Comparing the prices of different mobile phone plans before taking up a new phone contract.</td></tr>
</table>

No.	Question
20	Abdul brings home £1800 per month by being in employment. His monthly expenses are: Rent £800 Groceries £200 Transportation £150 Utilities and gas bills £200 Entertainment £200 At least how many months would it take him to save for a holiday that costs £1000? A. 2 months B. 3 months C. 4 months D. 6 months
21	Tom and Mary are of the same age and have the same type of savings account that earns an annual interest of 5% per year. Mary started saving £2000 a year at the age of 20 while Tom saved nothing. At the age of 50, Tom started saving £4000 a year. Who will have the **MOST** money in their account at the age of 75? A. Both would have the same amount of money. B. Mary, because she saved more money overall. C. Tom, because he saved more than Mary per year. D. Mary, because her money has compounded over a longer time.
22	Which of the following credit card users is likely to pay the **GREATEST** amount of finance charges per year if they spend the same amount per year on their credit cards? A. Ali, who always pays just the minimum amount each month. B. Ben, who always pays off the credit card bill in full shortly after receiving it. C. Caleb, who pays at least the minimum amount each month and more when he has the money. D. Denise, who usually pays off her credit card bill in full but on some occasions, will pay just the minimum amount.

(Please Turn Over)

No.	Question
23	Taxes are used to pay for many things, including _____. A. taxi services B. store decorations C. salaries of policemen D. salaries of fruit pickers
24	Under which of the following circumstances would it be most financially beneficial for you to borrow money to buy something now and repay with future income? A. When some clothes you like go on sale. B. When you need to buy a car to get a much better paying job. C. When you want to replace the old garden furniture with new ones. D. When the interest on the loan is greater than the interest you get on your savings.
25	What is the general relationship between risk and potential reward with regards to financial investments? A. The higher the risk, the lower the potential reward. B. The higher the risk, the greater the potential reward. C. The amount of risk does not influence potential reward. D. There is no general relationship between risk and potential reward.
26	An increase in the price of goods and services in an economy is known as _____. A. inflation B. deflation C. recession D. depression

No.	Question
27	Mandy bought travel insurance to insure herself during her holiday overseas. While on holiday, she lost £300 to pickpockets. Below shows part of the travel insurance policy schedule. **Description** | **Limit** | **Excess** Loss of cash | £250 | £20 Loss of documents | £250 | £50 **Covered** *You are covered up to the amount specified on your policy schedule for accidental loss or theft of your own cash and/or documents. Cash is only covered whilst being carried on yourself or left in a locked safety deposit box.* **Not Covered** *7. The policy excess as specified on your insurance schedule.* *8. If you do not exercise reasonable care in protecting your cash and documents against loss, theft or damage.* 9. *If you do not obtain a written police report within 48 hours of the discovery in the event of loss, burglary or theft of cash and/or documents.* If Mandy's claim was successful, how much will the insurance company pay her? A. £230 B. £250 C. £270 D. £300

(Please Turn Over)

No.	Question
28	If you are a shareholder in a company, you _____. A. will get dividends every year B. are insured on your investment C. have partial ownership in the company D. will get interest on your investment every year
29	Vinoth has £5,000 to invest. He is a safe investor and wants to avoid risky investments. Which of the following should he choose? A. Foreign currencies B. Shares in a listed company C. Fixed interest rates deposit accounts D. Shares in a private start-up company
30	Last year, Barry's motorbike was insured by the ANGSANA insurance company. The insurance policy covered damage to the motorbike and theft of the motorbike. Barry plans to renew his insurance with ANGSANA this year. Which of the following factors are likely to increase the cost of his motorbike insurance? IX. Barry painted his motorbike. X. Barry had two road accidents last year. XI. Barry changed the lock on his motorbike. XII. Barry changed his motorbike's engine with a more powerful one. A) I and IV B) II and IV C) III and IV D) II, III and IV

We are almost done. Please go on to the survey questions in the answer booklet

Answer Key

Question number	Answer
1	C
2	A
3	A
4	B
5	B
6	D
7	D
8	D
9	A
10	B
11	B
12	D
13	A
14	D
15	B
16	B
17	D
18	D
19	C
20	C
21	D
22	A
23	C
24	B
25	B
26	A
27	A
28	C
29	C
30	B

APPENDIX H Pilot answer booklet

Gender: Male/female (Please circle)

Question number	Answers
1	A B C D
2	A B C D
3	A B C D
4	A B C D
5	A B C D
6	A B C D
7	A B C D
8	A B C D
9	A B C D
10	A B C D
11	A B C D
12	A B C D
13	A B C D
14	A B C D
15	A B C D

Question number	Answers
16	A B C D
17	A B C D
18	A B C D
19	A B C D
20	A B C D
21	A B C D
22	A B C D
23	A B C D
24	A B C D
25	A B C D
26	A B C D
27	A B C D
28	A B C D
29	A B C D
30	A B C D

(Please Turn Over)

Survey Questions

1. Which ethnic group do you belong to?

   ☐ White (White British, White Irish, any other White background)

   ☐ Mixed (White and Black Caribbean, White and Black African, White and Asian)

   ☐ Asian or Asian British (Indian, Pakistani, Bangladeshi, Chinese)

   ☐ Black or Black British (Caribbean, African, any other Black background)

   ☐ Other ethnic group (Please state: _____)

   ☐ I prefer not to say.

2. Are you doing any business studies or related course such as personal finance, accounting or economics?

   ☐ Yes

   ☐ No

3. What was your Year 9 assessment level for English? _____

4. What was your Year 9 assessment level for Maths? _____

5. Which statement best describes yourself? (Please tick **one** only.)

   ☐ If I have money, I prefer to save it.

   ☐ If I have money, I prefer to spend it.

   ☐ If I have money, I might save or spend it.

   ☐ If I have money, I will use it to start a business.

6. Complete the following statement

   "I learn about managing money mainly from
   _____."

7. Read the following statements and tell us how much you agree or disagree with each of them.

   Put a tick (✓) in a box for each statement.

	Strongly agree ☺☺	Agree ☺	Neither agree nor disagree 😐	Disagree ☹	Strongly disagree ☹☹
Knowing how to manage money is important to me.					
Money is there to be spent.					
I should start saving money only when I have a paying job.					
I would rather earn my own money than to ask my parents for money.					
I am comfortable about owing someone money.					
I like to compare prices.					
I am confident of managing my own money.					

(Please Turn Over)

8. Do you receive free school meals in school?

☐ Yes

☐ No

☐ I prefer not to say.

9. What is your home postcode? _____

☐ I don't know.

☐ I prefer not to say.

10. How many books do you think your family owns?

☐ 0 to 20

☐ 20 to 50

☐ 51 to 100

☐ more than 100

11. Does either one of your parents have A level qualifications (or equivalent)?

☐ Yes

☐ No

12. Does either one of your parents have a University degree?

☐ Yes

☐ No

Thank You for Participating!

APPENDIX J Main study question booklet

FINANCIAL LITERACY ASSESSMENT FOR YOUNG PEOPLE

Instructions

1. There are 25 questions and 11 printed pages in this question booklet.
2. You will be given a separate answer booklet.
3. For each question, there are four possible choices.
4. Select the answer you think is correct and circle the appropriate letter A, B, C or D in the answer booklet, page 1.
5. You may use a calculator.
6. You may write in the question booklet.
7. When you have finished these 25 questions, please complete the survey questions from pages 2 to 4 in the answer booklet.

THANK YOU FOR PARTICIPATING

No.	Question
1	If Jenny uses her debit card to pay for purchases that cost £500 in total but she only has £450 in her current account. This would be an example of _____. A. getting a credit check B. making a bank transfer C. using an overdraft facility D. using a direct debit facility
2	Kumar used his credit card to buy a shirt at The Shirt Shop for £20. As a result of this transaction, the credit card company will _____. A. lend Kumar £20 B. lend The Shirt Shop £20 C. add £20 to Kumar's bank account D. deduct £20 from Kumar's bank account
3	Calculate the amount of pounds sterling (£) needed to buy US$100, based on the following exchange rate. ***£1 = US$ 1.60*** A. £62.50 B. £82.50 C. £160.00 D. £625.00
4	Exhibit A (page 3) shows the prices of watching movies at Concord Cinemas. Pam is a 16 year-old student. She is a Concord Club member. She wants to watch the movie "The Trip". She can watch the movie at any of the following screening dates and times listed below. Which of the following options will be the **cheapest** for her? A. 6th August 2012, Monday, 5.20pm B. 7th August 2012, Tuesday, 5.20pm C. 9th August 2012, Thursday, 4.30pm D. 12th August 2012, Sunday, 4.30pm

Exhibit A

CONCORD CINEMA PRICE LIST

TICKET PRICES	SUPER SAVER Monday to Thursday before 5pm	PEAK Monday to Thursday from 5pm, All day on Friday, Saturday and Sunday
Child (Ages 12 and below)	£5.50	£6.50
Teen (Ages 13 to 17)	£6.00	£7.00
Student (valid student card required)	£6.50	£7.50
Adult (Ages 18+)	£8.00	£9.50
Concord Tuesday	20% off all listed prices (including Super Saver) on Tuesdays for Concord Club members	

(Please Turn Over)

No.	Question
5	You put £500 into a savings account at the beginning of the year and had £512.50 in the account at the end of the year. Calculate the annual interest rate. A. 1.0% B. 1.5% C. 2.0% D. 2.5%
6	In which of the following situations is it **most likely** that bank charges will be incurred? A. Gemma uses a credit card for all her purchases and she pays the credit card bill in full before the due payment date. B. Sheema has a basic bank account with a cash withdrawal card and no overdraft facility. She can only buy something when there is money in her account. C. Jim's salary is credited into his bank account every month and his bills (which are never more than his salary) are paid on the same day using direct debits. D. Tim is holidaying in France and he has run out of cash. He uses his credit card to get some money from a cash withdrawal machine.
7	Which of the following statements is **NOT** correct about the use of most ATM (Automated Teller Machine) cards? A. You must have a bank account in order to have and use an ATM card. B. You can generally use an ATM card to get cash from a cash machine at any time of the day. C. There is a limit to the amount of cash you can withdraw from cash machines per day, with an ATM card. D. You can use ATM cards to withdraw cash from any cash machine in the world without paying extra fees.

No.	Question
8	Stationery Palace (www.stationerypalace.co.uk) is having an online sales promotion which gives **10% discount** on all stationery and Yang has decided to make a purchase of **10** refill pads. The figure below shows her shopping cart at the check-out page on the website. Some numbers have been left out on purpose.

Item	Price	Quantity	Subtotal
Refill pad (A pack of 5 refill pads, 160 pages each)	£6.90	2	£13.80
		Discount 10%	?
		Delivery	?
		Final Total	?

Below is an extract from the website about delivery charges

"Delivery is free of charge on orders of £30 or more. Below this figure, a charge of £2.50 is applied to orders with a value of £5 to £29.99 and a charge of £3.50 is applied to orders of £4.99 or less."

How much will Yang have to pay for the purchase in total?

A. £12.42

B. £14.92

C. £15.92

D. £16.30

9 Nadia opens a savings account and deposits £500. She does not make any additional deposits for 2 years. If the account has a fixed annual compound interest rate of 5%, how much will Nadia have in her savings account at the end of two years?

A. £510.25

B. £525.25

C. £550.25

D. £551.25

<table>
<tr><th>No.</th><th>Question</th></tr>
<tr><td>10</td><td>You need to buy 12 loo rolls. Which of the following promotions will give you the best buy?

<table><tr><td>(A)
A pack of 12 rolls for £4.80</td><td>(B)
A pack of 4 rolls for £3
Special offer: 3 Packs for the price of 2</td></tr><tr><td>(C)
A Pack of 3 rolls for £1.80
Special offer: Save 10% off this price</td><td>(D)
A Pack of 6 rolls for £7.20
Special Offer: Buy 1 pack, get 1 pack free</td></tr></table></td></tr>
<tr><td>11</td><td>The following payment methods are accepted in most retail stores. Which of the following payment methods enable you to buy something now and pay for it later?

A. debit card
B. credit card
C. prepaid card
D. gift vouchers</td></tr>
<tr><td>12</td><td>Sandy is paid £6.80 per hour for a 40 hour work week. Overtime is paid at double time (twice the normal hourly rate). How much will she be paid for a full week’s work plus 2 hours overtime?

A. £272.00
B. £278.80
C. £285.60
D. £299.20</td></tr>
</table>

The figure below shows Ms Penny's most recent payslip.
Use it to answer Questions 13.

Name	National Insurance number	Pay Date	Tax Code
Ms Penny	SL 49 78 56 B	25 Oct 2012	BR
Payments		**Deductions**	
Description	**Amount**	**Description**	**Amount**
Gross Pay	£2000	PAYE Tax	£410
Overtime	£100	Student Loan	£30
		National Insurance	£200
		Company Pension	£130
Total Gross Pay	£2100	**Total Deductions**	£770
		Net Pay	£1330

No.	Question
13	How much did Ms Penny bring home on 25 Oct 2012? A. £1230 B. £1330 C. £2100 D. £2870
14	There are four different job advertisements below. Which job shows that the worker will receive income from commission only?

(A)	(B)
Flower Seller for Valentine's Day Flexible working hours You will be paid 30% of total sales.	*Temporary office worker needed* 20 hours per week over 4 weekdays £7 per hour
(C)	(D)
Cleaner needed Two days a week, 3h each day £6.19 per hour (weekend work at time and a half)	*Paper round* £7 per round per day plus 5p per newspaper delivered.

<table>
<tr><th>No.</th><th>Question</th></tr>
<tr><td>15</td><td>
The Smith family takes home £3000 in earnings and spends about £3500 each month (see table below).

Mr Smith uses their car to drive to work in another town as well as to drop off and pick up his 2 children at their primary school.

Mrs Smith works as a full-time bank cashier at a local bank.

Which is the best action they can take to balance their budget?

<table>
<tr><th>Description</th><th>Outgoing (£)</th></tr>
<tr><td>Clothing</td><td>300</td></tr>
<tr><td>Groceries</td><td>600</td></tr>
<tr><td>Petrol for car</td><td>250</td></tr>
<tr><td>Other travel expenses</td><td>100</td></tr>
<tr><td>House Mortgage</td><td>800</td></tr>
<tr><td>Golf Club membership</td><td>200</td></tr>
<tr><td>School related expenses (books, stationery, uniforms etc.)</td><td>100</td></tr>
<tr><td>Gas, electricity, phone and internet bills</td><td>300</td></tr>
<tr><td>Eating out at restaurants</td><td>300</td></tr>
<tr><td>Car loan</td><td>300</td></tr>
<tr><td>Family activities (cinema, bowling, camping)</td><td>250</td></tr>
<tr><td>Total</td><td>3500</td></tr>
</table>
A. Sell the car.
B. Reduce clothing and school related expenses.
C. Reduce school related and family activities expenses.
D. Cancel the golf club membership and reduce eating out expenses.
</td></tr>
<tr><td>16</td><td>
Which of the following actions is <u>not</u> likely to result in more personal savings?

A. Cycling to work instead of driving a car.

B. Buying daily essential items in bulk when prices are low.

C. Using a store discount coupon to buy something you did not plan to get.

D. Comparing the prices of different mobile phone plans before taking up a new phone contract.
</td></tr>
</table>

No.	Question
17	Abdul brings home £1800 per month by being in employment. His monthly expenses are: | Rent | £800 | | Groceries | £200 | | Transportation | £150 | | Utilities and gas bills | £200 | | Entertainment | £200 | At least how many months would it take him to save for a holiday that costs £1000? A. 2 months B. 3 months C. 4 months D. 6 months
18	Tom and Mary are of the same age and have the same type of savings account that earns an annual interest of 5% per year. Mary started saving £2000 a year at the age of 25 while Tom saved nothing. At the age of 50, Tom started saving £4000 a year. Who will have the **MOST** money in their account at the age of 75? A. Both would have the same amount of money. B. Mary, because she saved more money overall. C. Tom, because he saved more than Mary per year. D. Mary, because her money has compounded over a longer time.
19	Which of the following credit card users is likely to pay the **GREATEST** amount of finance charges per year if they spend the same amount per year on their credit cards? A. Ali, who always pays just the minimum amount each month. B. Ben, who always pays off the credit card bill in full shortly after receiving it. C. Caleb, who pays at least the minimum amount each month and more when he has the money. D. Denise, who usually pays off her credit card bill in full but on some occasions, will pay just the minimum amount.

No.	Question
20	Taxes are used to pay for many things, including _____. A. taxi services B. store decorations C. salaries of policemen D. salaries of fruit pickers
21	Under which of the following circumstances would it be most financially beneficial for you to borrow money to buy something now and repay with future income? A. When some clothes you like go on sale. B. When you need to buy a car to get a much better paying job. C. When you want to replace the old garden furniture with new ones. D. When the interest on the loan is greater than the interest you get on your savings.
22	An increase in the price of goods and services in an economy is known as _____. A. inflation B. deflation C. recession D. depression
23	If you are a shareholder in a company, you _____. A. will get dividends every year B. are insured on your investment C. have partial ownership in the company D. will get interest on your investment every year

No.	Question
24	Vinoth has £5,000 to invest. He is a safe investor and wants to avoid risky investments. Which of the following should he choose? A. Foreign currencies B. Shares in a listed company C. Fixed interest rates deposit accounts D. Shares in a private start-up company
25	Last year, Barry's motorbike was insured by the ANGSANA insurance company. The insurance policy covered damage to the motorbike and theft of the motorbike. Barry plans to renew his insurance with ANGSANA this year. Which of the following factors are likely to increase the cost of his motorbike insurance? I. Barry painted his motorbike. II. Barry had two road accidents last year. III. Barry changed the lock on his motorbike. IV. Barry changed his motorbike's engine with a more powerful one. A) I and IV B) II and IV C) III and IV D) II, III and IV

We are almost done. Please go on to the survey questions in the answer booklet.

Answer Key

Question number	Answer
1	C
2	A
3	A
4	B
5	D
6	D
7	D
8	B
9	D
10	A
11	B
12	D
13	B
14	A
15	D
16	C
17	C
18	D
19	A
20	C
21	B
22	A
23	C
24	C
25	B

APPENDIX K Main study answer booklet

Answer Booklet

Please circle one letter for each question.

Question number	Answers
1	A B C D
2	A B C D
3	A B C D
4	A B C D
5	A B C D
6	A B C D
7	A B C D
8	A B C D
9	A B C D
10	A B C D
11	A B C D
12	A B C D

Question number	Answers
13	A B C D
14	A B C D
15	A B C D
16	A B C D
17	A B C D
18	A B C D
19	A B C D
20	A B C D
21	A B C D
22	A B C D
23	A B C D
24	A B C D
25	A B C D

Survey Questions

8. Which ethnic group do you belong to?

   ☐ White (White British, White Irish, any other White background)

   ☐ Mixed (White and Black Caribbean, White and Black African, White and Asian)

   ☐ Asian or Asian British (Indian, Pakistani, Bangladeshi, Chinese)

   ☐ Black or Black British (Caribbean, African, any other Black background)

   ☐ Other ethnic group (Please state: _____)

   ☐ I prefer not to say.

9. Are you doing any business studies or related course such as personal finance, accounting or economics?

   ☐ Yes

   ☐ No

10. What was your Year 9 assessment level for English? _____

11. What was your Year 9 assessment level for Maths? _____

12. Which statement best describes yourself? (Please tick **one** only.)

   ☐ If I have money, I prefer to save it.

   ☐ If I have money, I prefer to spend it.

   ☐ If I have money, I might save or spend it.

   ☐ If I have money, I will use it to start a business.

13. Complete the following statement

   "I learn about managing money mainly from
   _____."

14. Read the following statements and tell us how much you agree or disagree with each of them.

    Put a tick (✓) in a box for each statement.

	Strongly agree ☺☺	Agree ☺	Neither agree nor disagree 😐	Disagree ☹	Strongly disagree ☹☹
Knowing how to manage money is important to me.					
Money is there to be spent.					
I should start saving money only when I have a paying job.					
I would rather earn my own money than to ask my parents for money.					
I am comfortable about owing someone money.					
I like to compare prices.					
I am confident of managing my own money.					

(Please Turn Over)

1. What is your gender?

☐ Male

☐ Female ☐ I prefer not to say.

2. Do you receive free school meals in school?

☐ Yes

☐ No ☐ I prefer not to say.

3. What is your home postcode? _____

☐ I don't know. /I prefer not to say.

4. How many books do you think your family owns?

☐ 0 to 20

☐ 21 to 50

☐ 51 to 100

☐ More than 100 ☐ I don't know. /I prefer not to say.

5. Does either one of your parents have A level qualifications (or equivalent)?

☐ Yes

☐ No ☐ I don't know. /I prefer not to say.

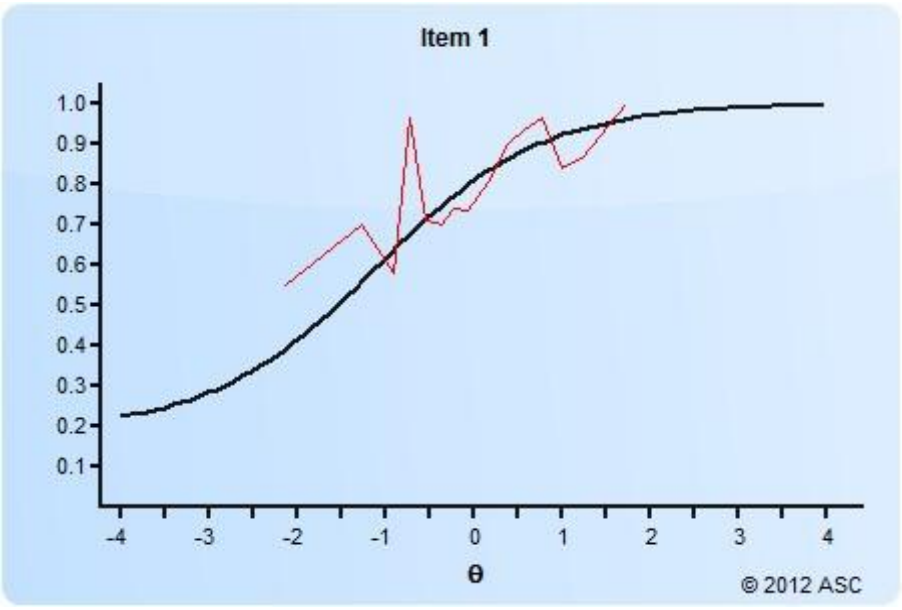
6. Does either one of your parents have a University degree?

☐ Yes

☐ No ☐ I don't know. /I prefer not to say.

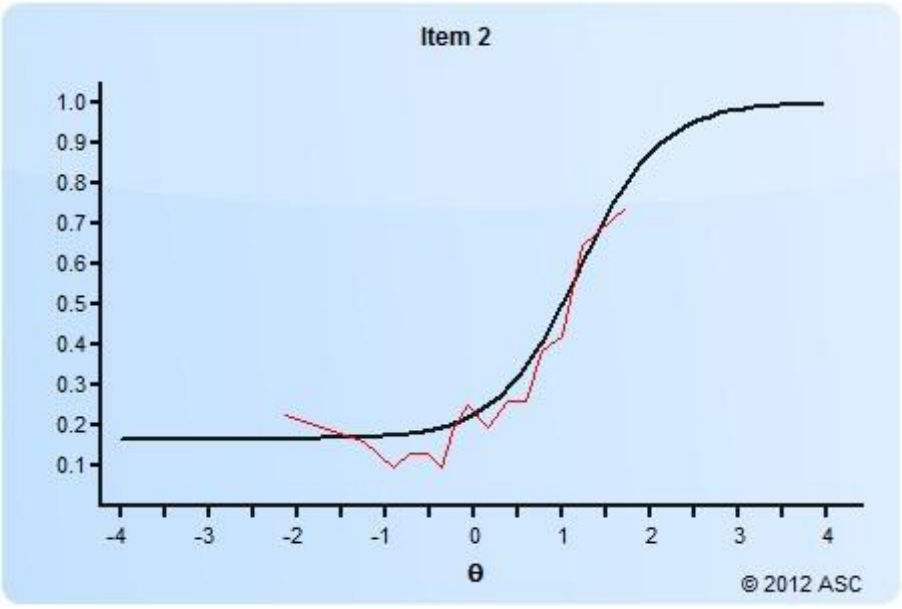
The End

APPENDIX L Item Characteristics Curves of 30 test items in pilot test



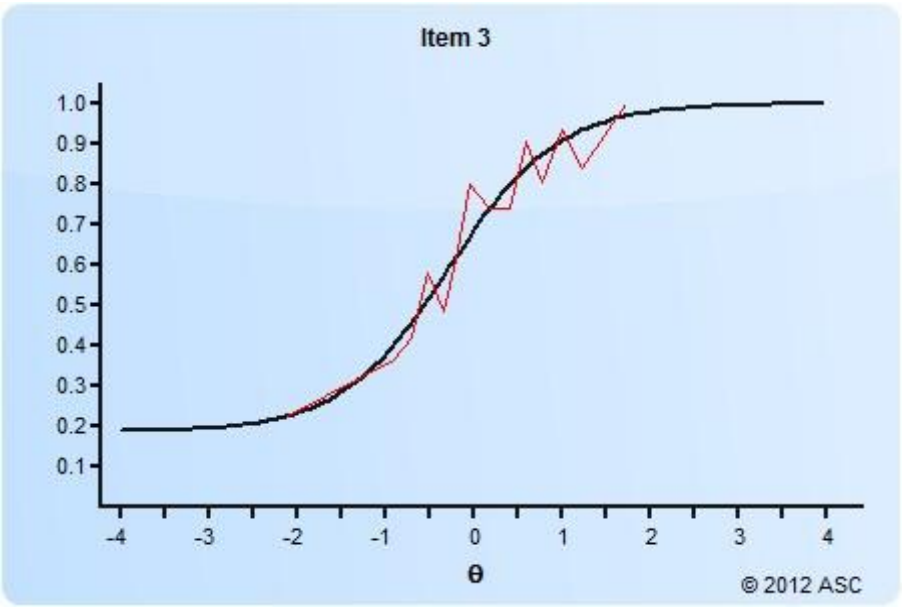
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.045	-1.053	0.189	0.109	0.126	0.215	28.259	12	0.005	0.774	0.439



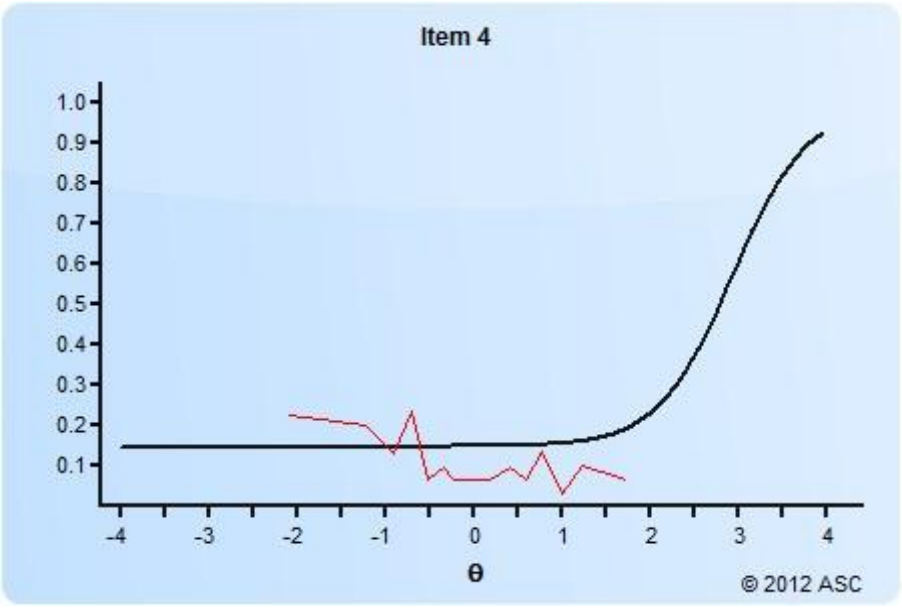
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.108	1.288	0.166	0.175	0.098	0.086	7.639	12	0.813	0.666	0.505



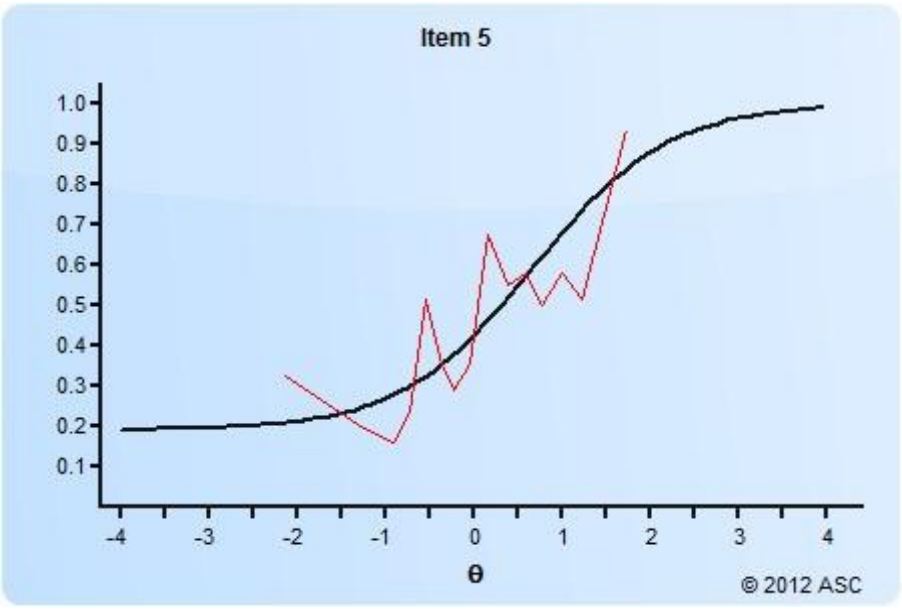
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.591	-0.216	0.186	0.122	0.087	0.155	12.229	12	0.427	0.565	0.572



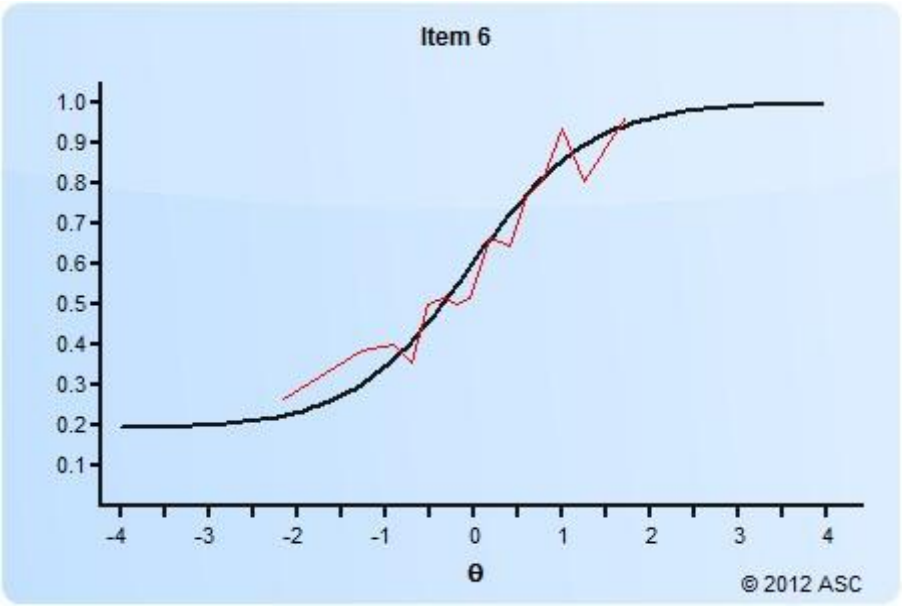
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.297	3.068	0.147	0.505	0.579	0.066	21.188	12	0.048	1.449	0.147



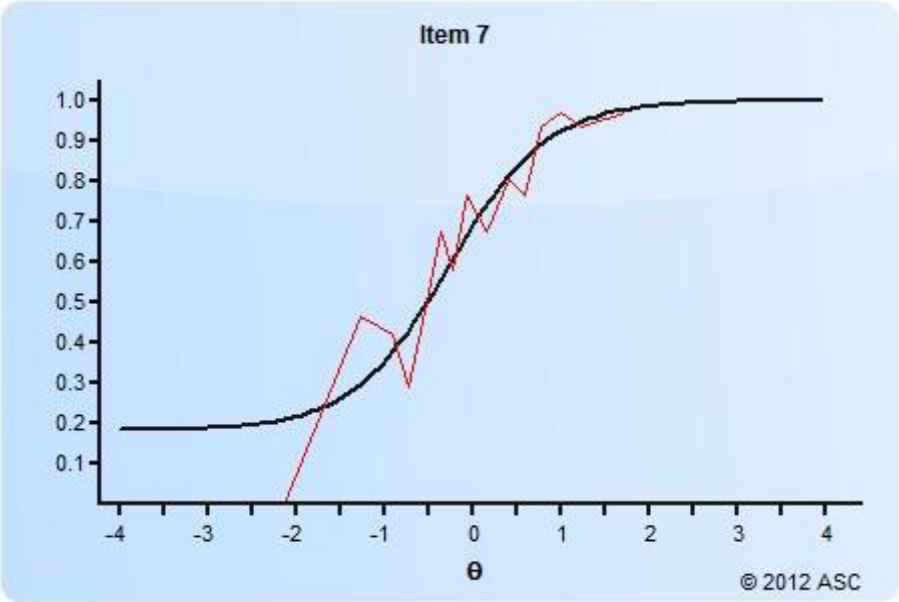
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.293	0.760	0.190	0.154	0.114	0.116	30.105	12	0.003	0.574	0.566



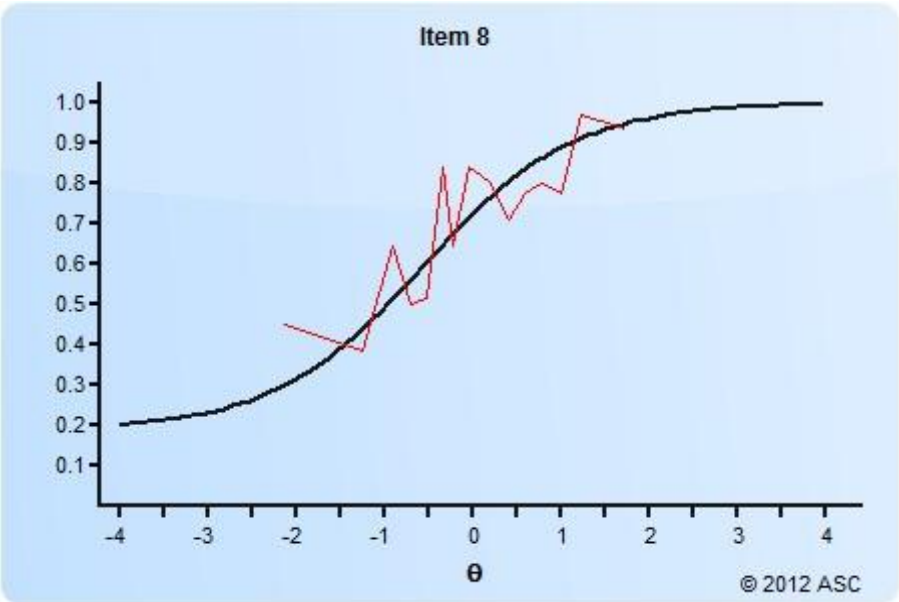
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.451	0.037	0.191	0.133	0.094	0.143	7.754	12	0.804	0.554	0.580



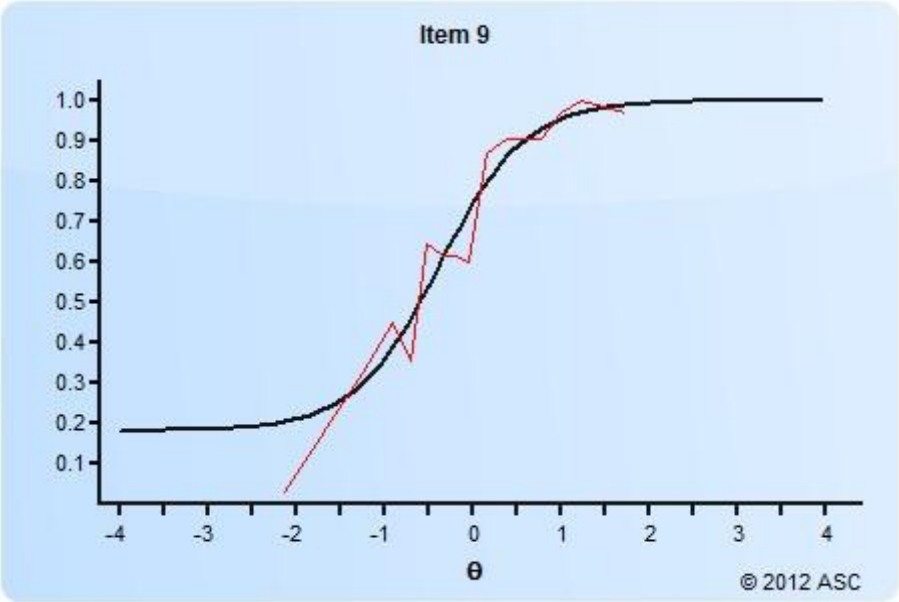
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.769	-0.202	0.182	0.119	0.080	0.151	23.069	12	0.027	0.718	0.473



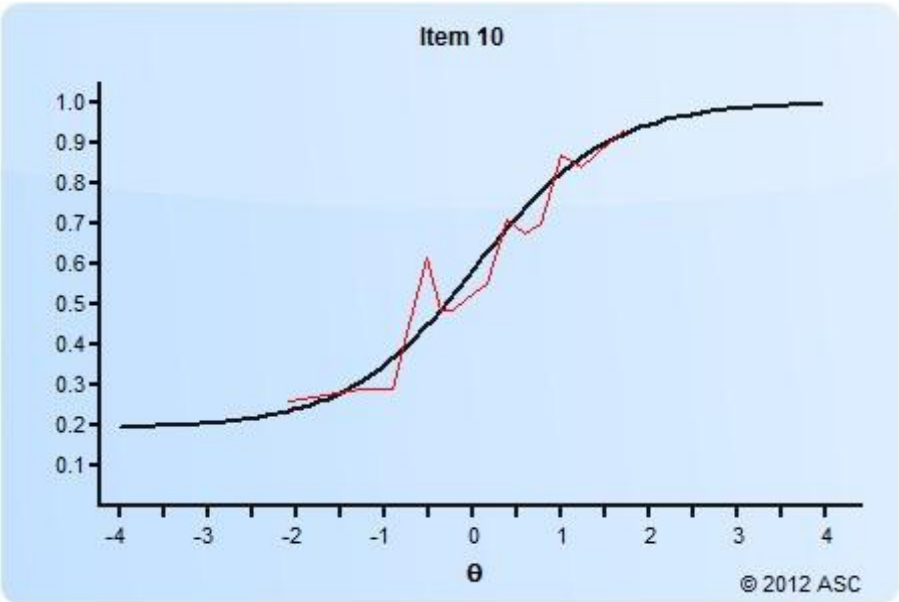
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.155	-0.507	0.188	0.125	0.111	0.179	23.439	12	0.024	0.586	0.558



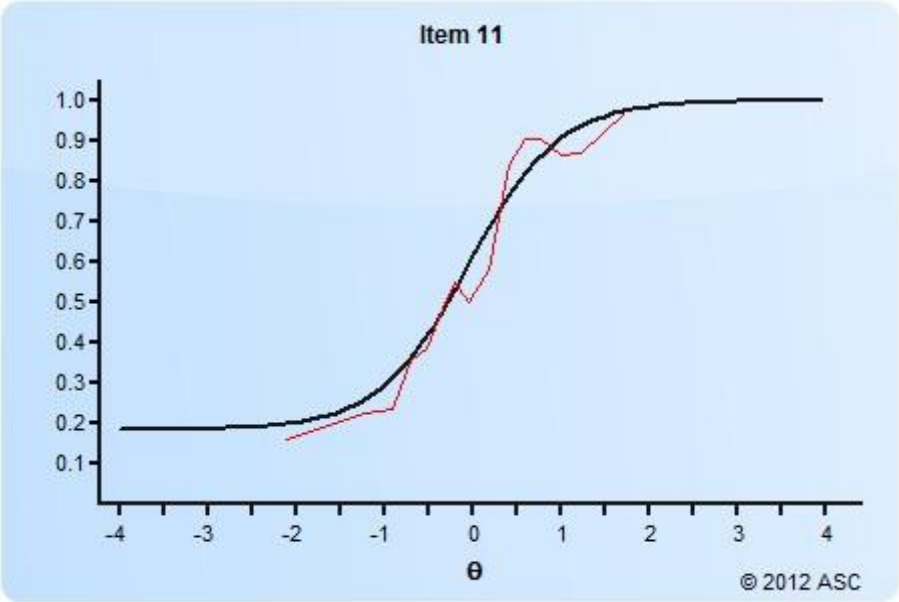
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.016	-0.317	0.181	0.115	0.073	0.156	15.974	12	0.192	1.370	0.171



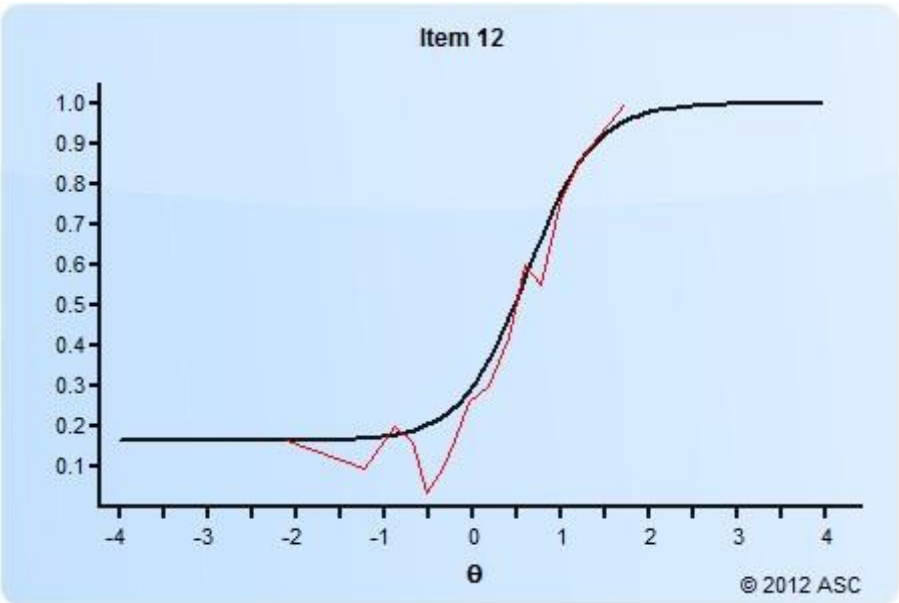
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.328	0.119	0.192	0.140	0.101	0.142	8.315	12	0.760	0.518	0.604



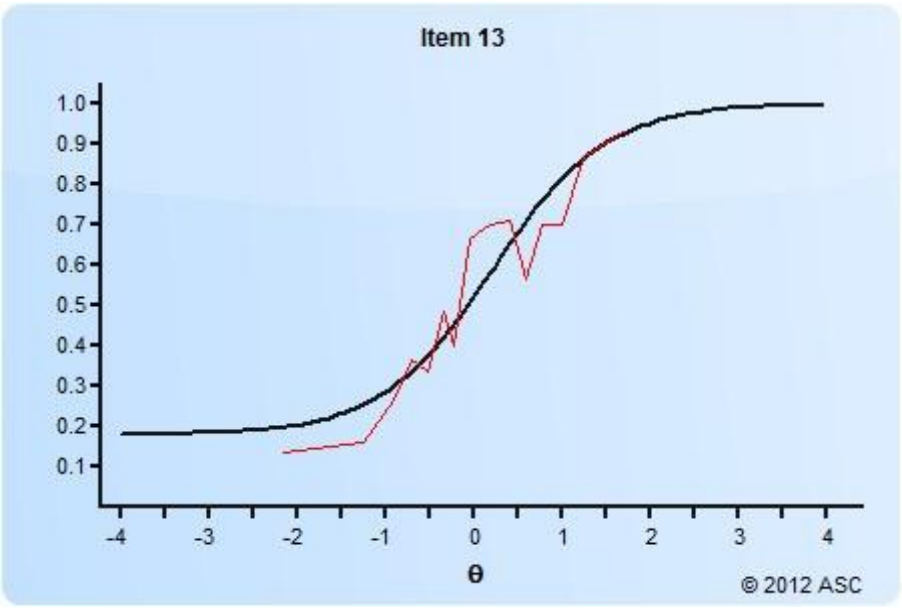
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.914	0.021	0.184	0.122	0.077	0.136	9.108	12	0.694	0.986	0.324



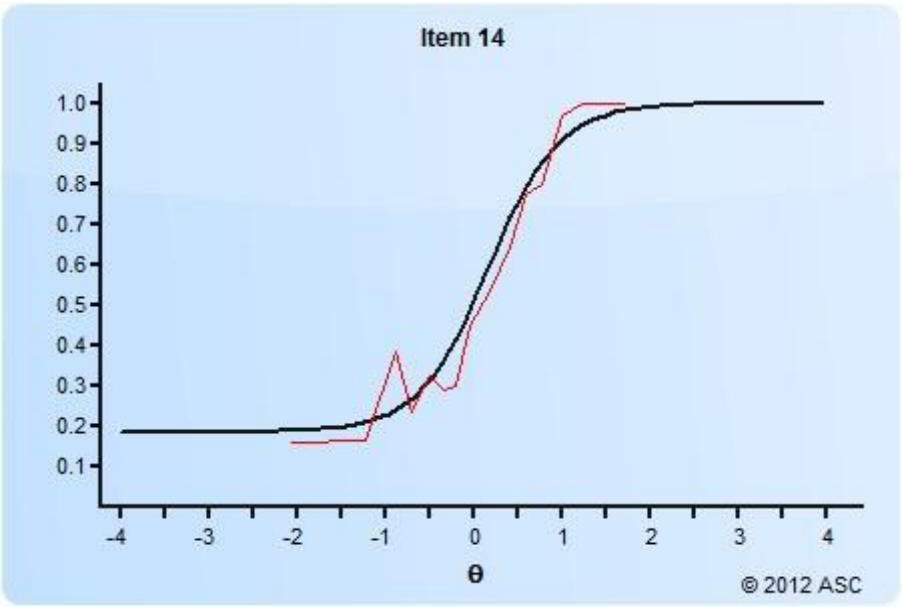
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.602	0.707	0.164	0.148	0.069	0.095	13.690	12	0.321	1.386	0.166



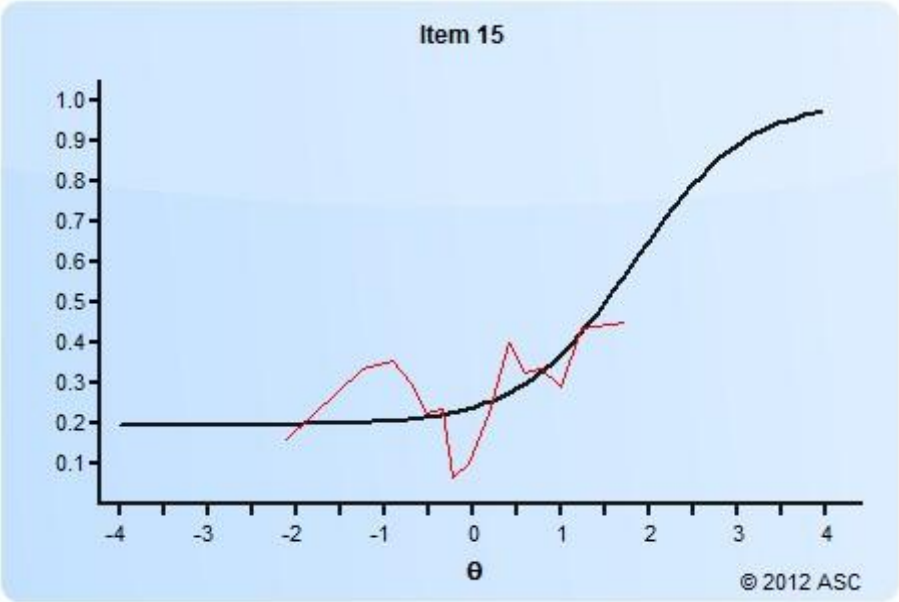
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.540	0.291	0.179	0.136	0.091	0.128	14.992	12	0.242	0.659	0.510



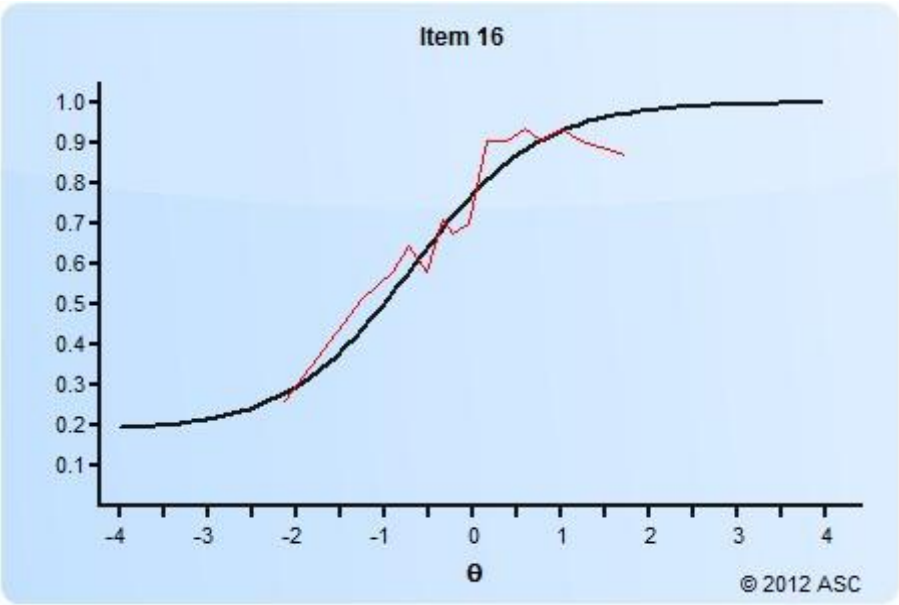
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.456	0.242	0.186	0.125	0.067	0.118	11.416	12	0.494	0.449	0.653



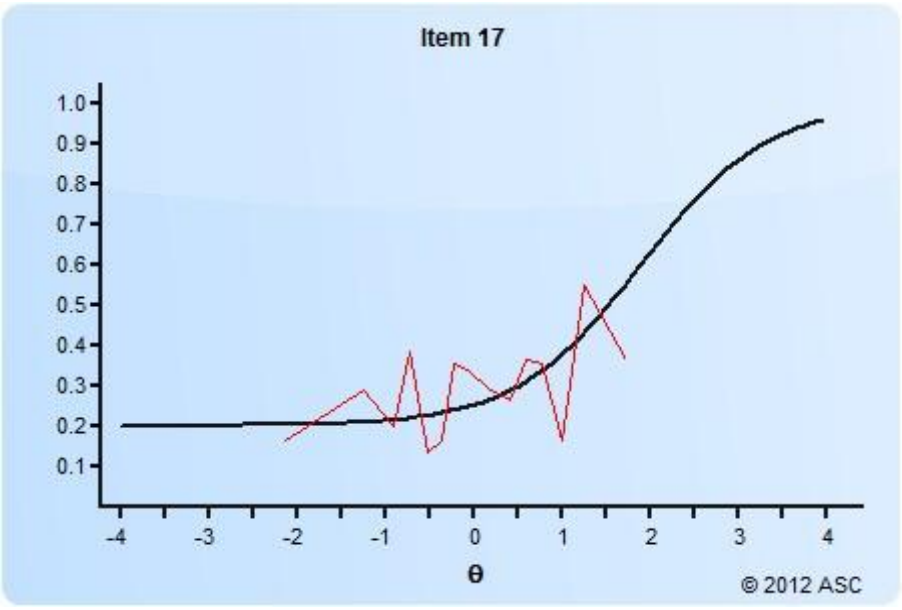
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.537	1.926	0.195	0.180	0.173	0.086	21.496	12	0.044	0.790	0.429



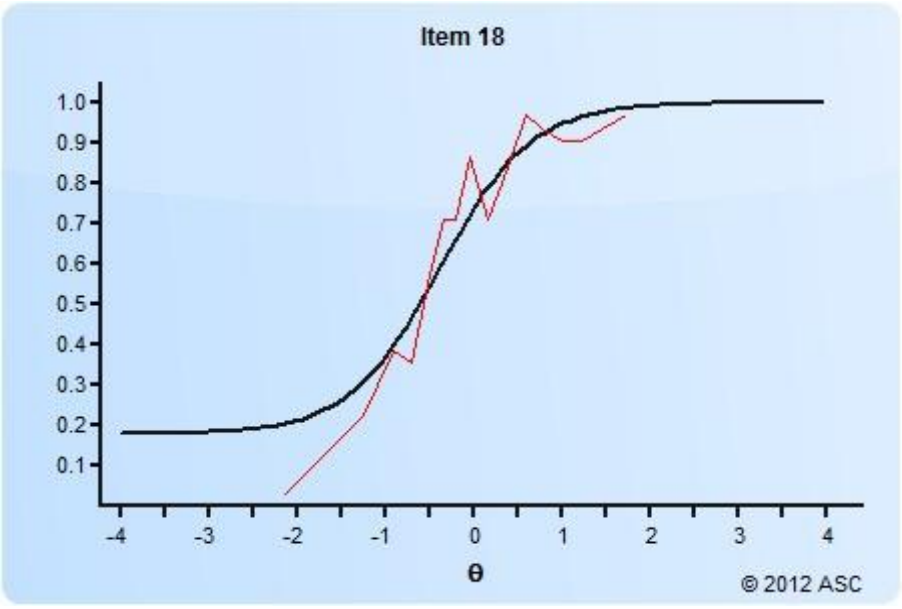
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.380	-0.621	0.185	0.114	0.098	0.185	18.983	12	0.089	0.886	0.376



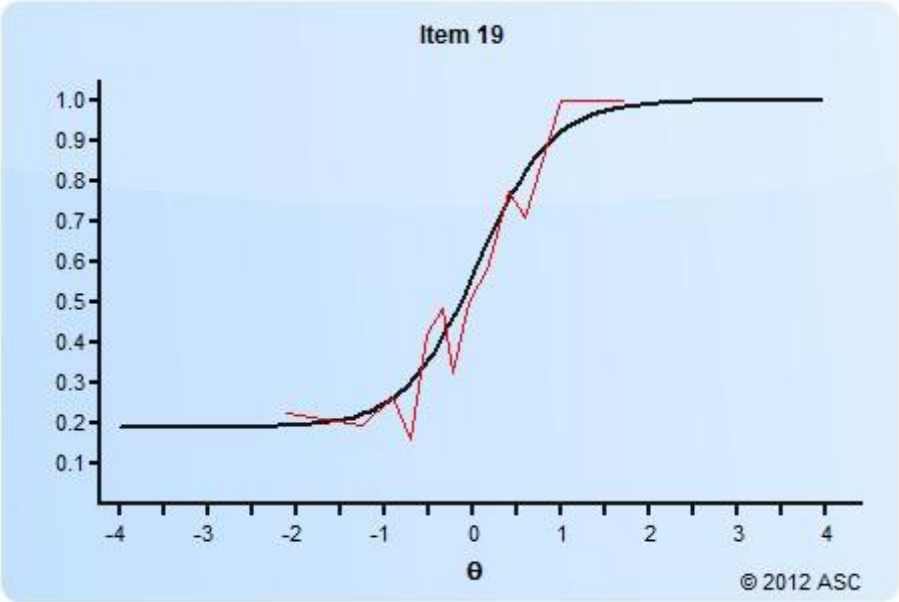
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.384	2.000	0.201	0.174	0.188	0.088	24.019	12	0.020	0.646	0.518



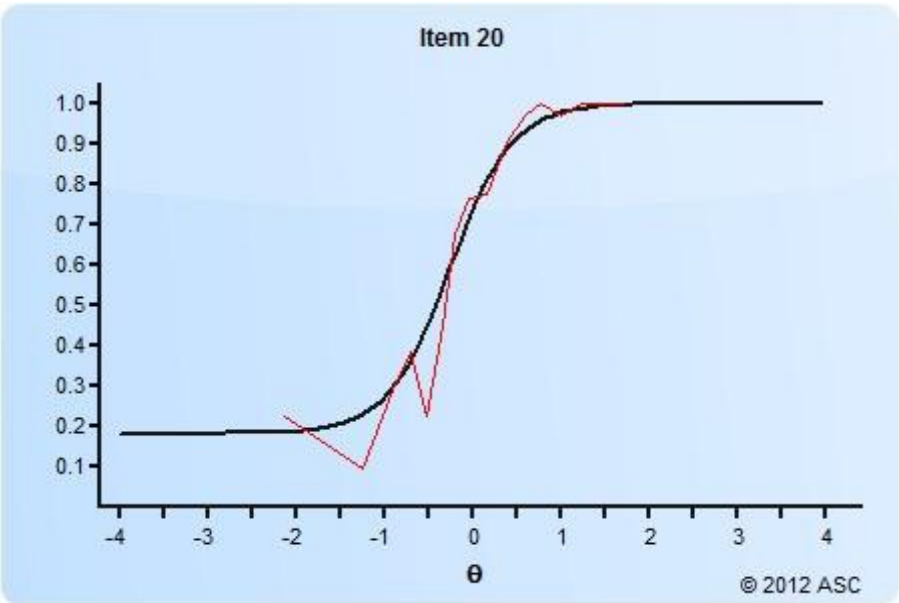
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.901	-0.322	0.178	0.115	0.076	0.157	21.548	12	0.043	1.217	0.224



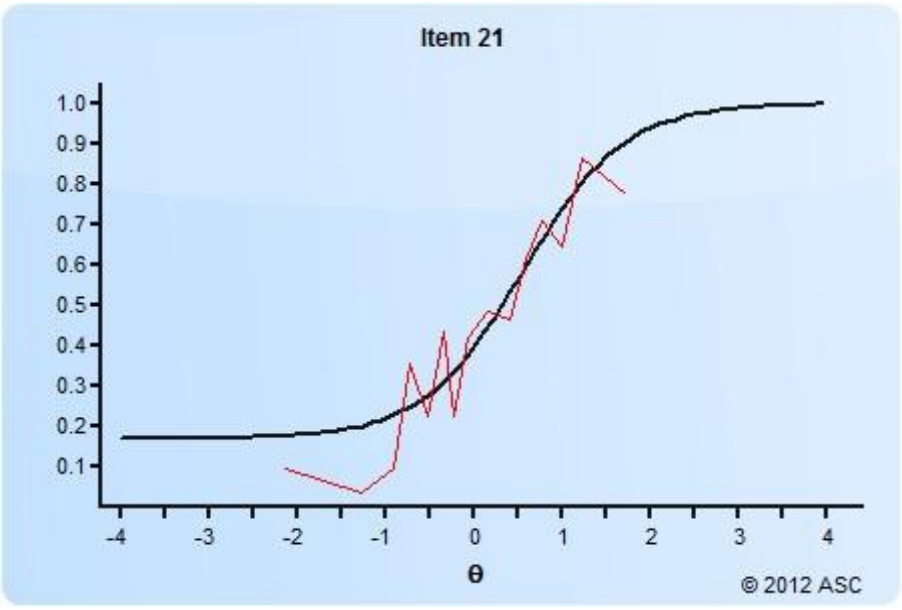
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.346	0.135	0.190	0.123	0.069	0.125	14.341	12	0.279	1.576	0.115



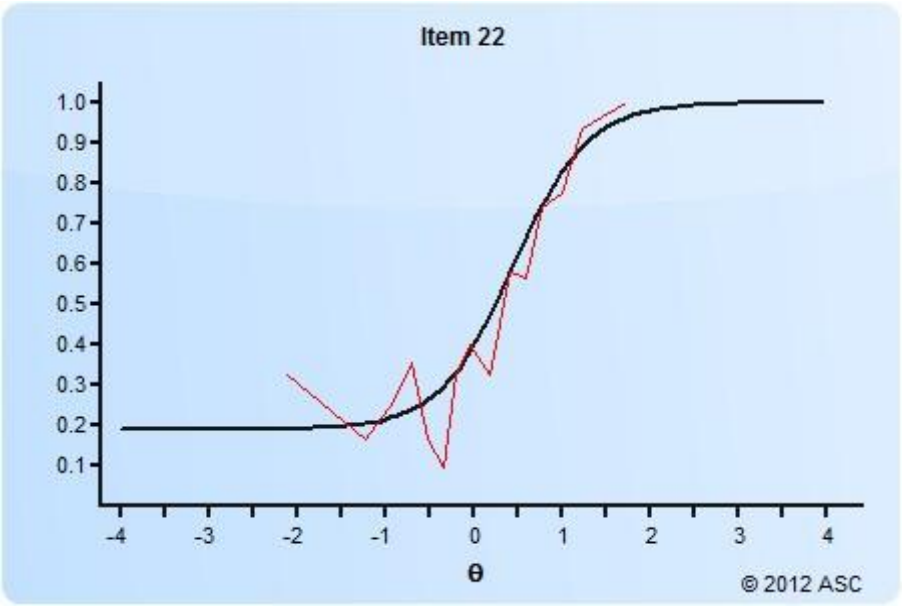
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.778	-0.195	0.182	0.118	0.060	0.139	14.414	12	0.275	0.504	0.614



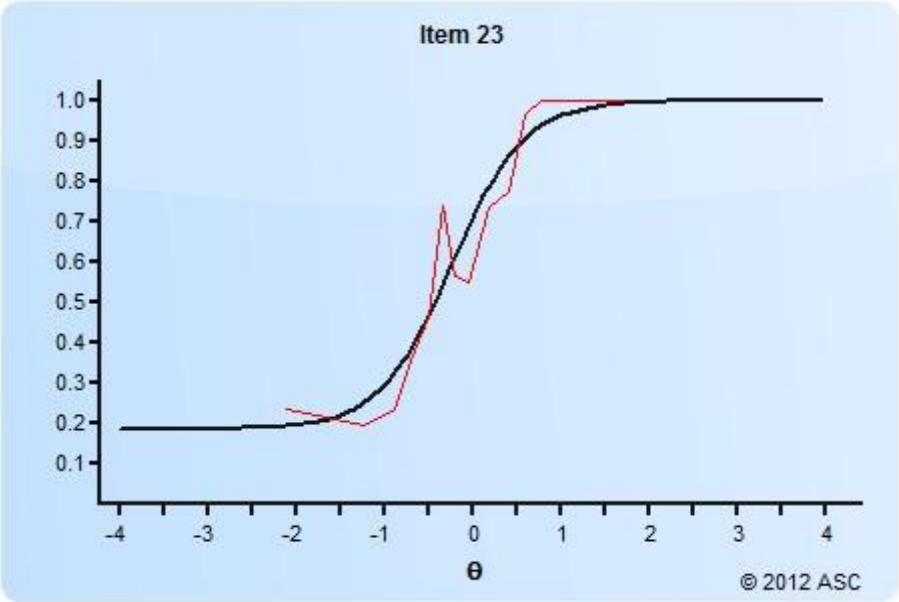
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.731	0.638	0.169	0.142	0.088	0.109	24.266	12	0.019	0.764	0.445



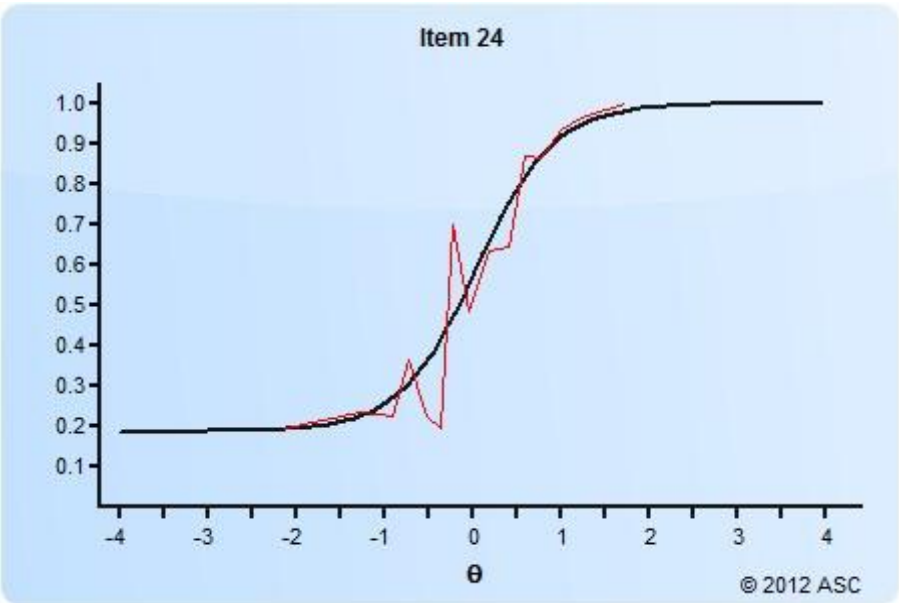
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.331	0.529	0.190	0.140	0.073	0.108	18.716	12	0.096	1.073	0.283



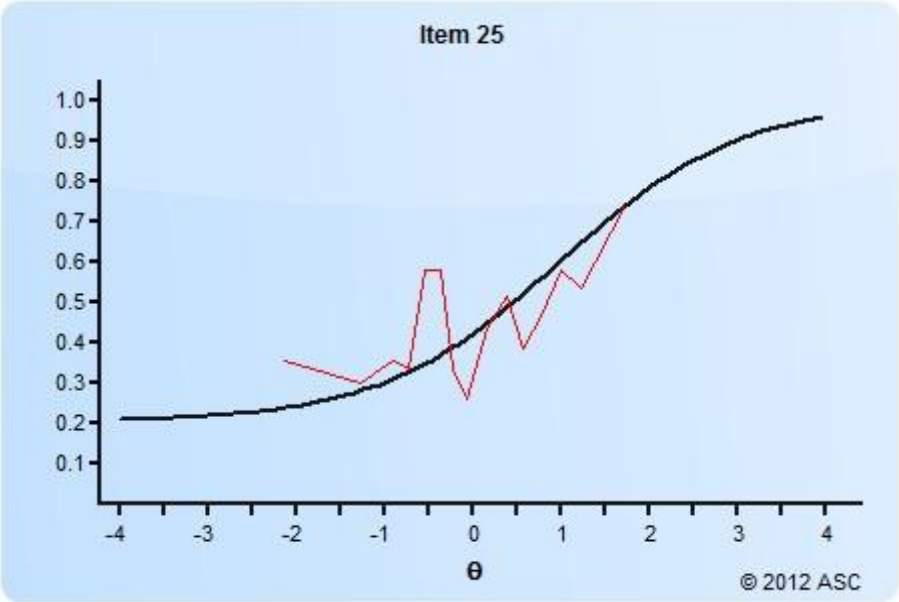
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.408	-0.172	0.185	0.117	0.066	0.142	17.430	12	0.134	0.656	0.512



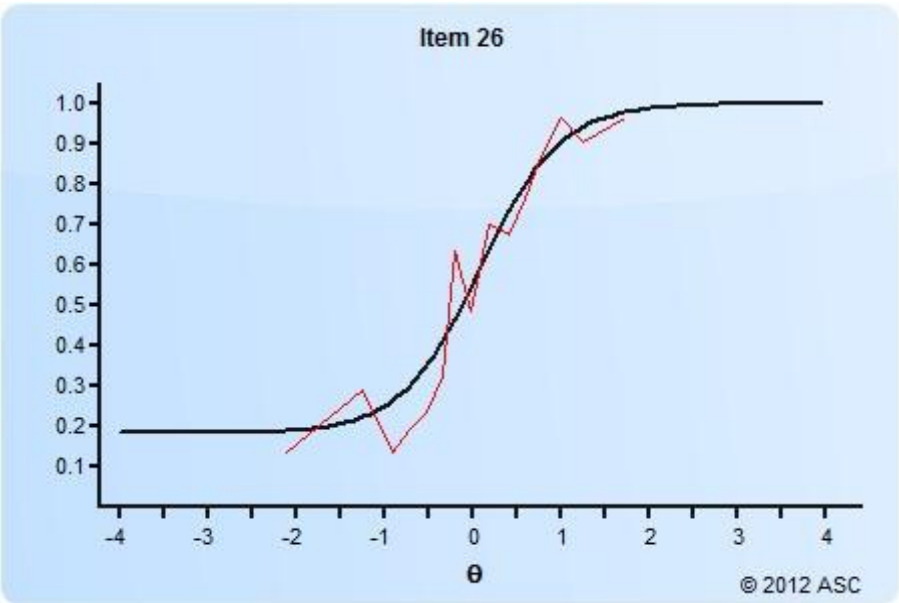
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.230	0.117	0.187	0.122	0.070	0.127	19.607	12	0.075	0.425	0.671



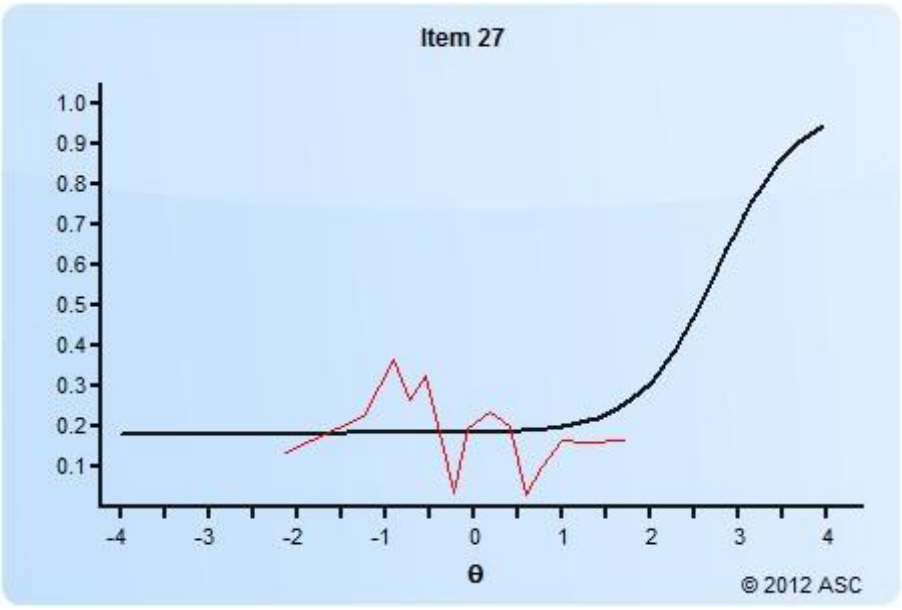
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.964	1.080	0.203	0.162	0.154	0.117	24.142	12	0.019	1.005	0.315



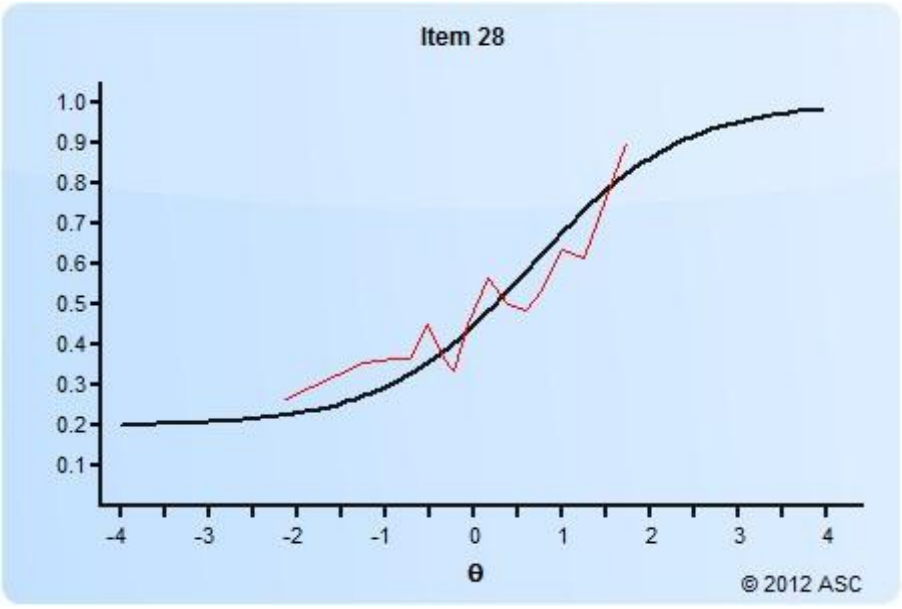
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.173	0.158	0.182	0.123	0.071	0.125	15.833	12	0.199	1.169	0.242



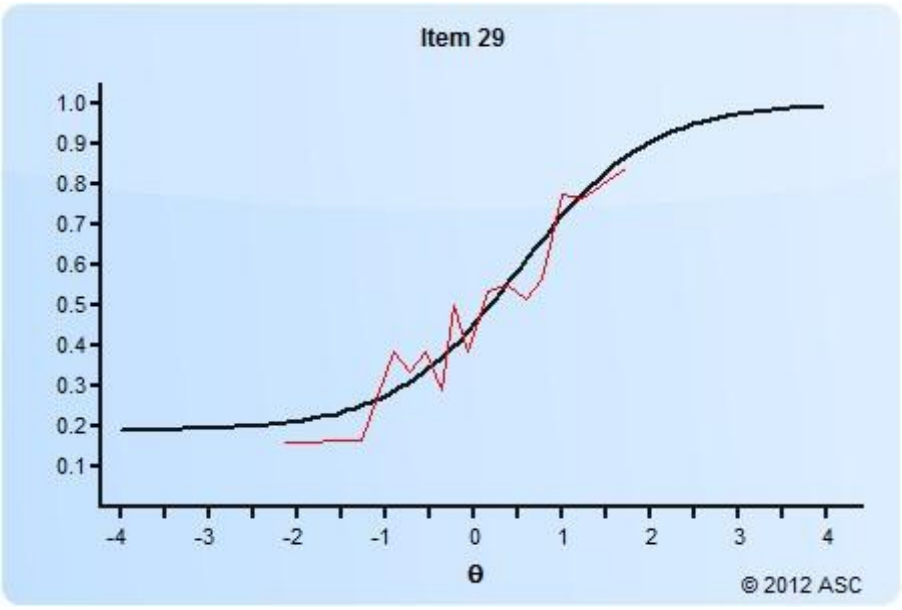
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.165	2.892	0.182	0.422	0.465	0.073	26.401	12	0.009	1.120	0.263



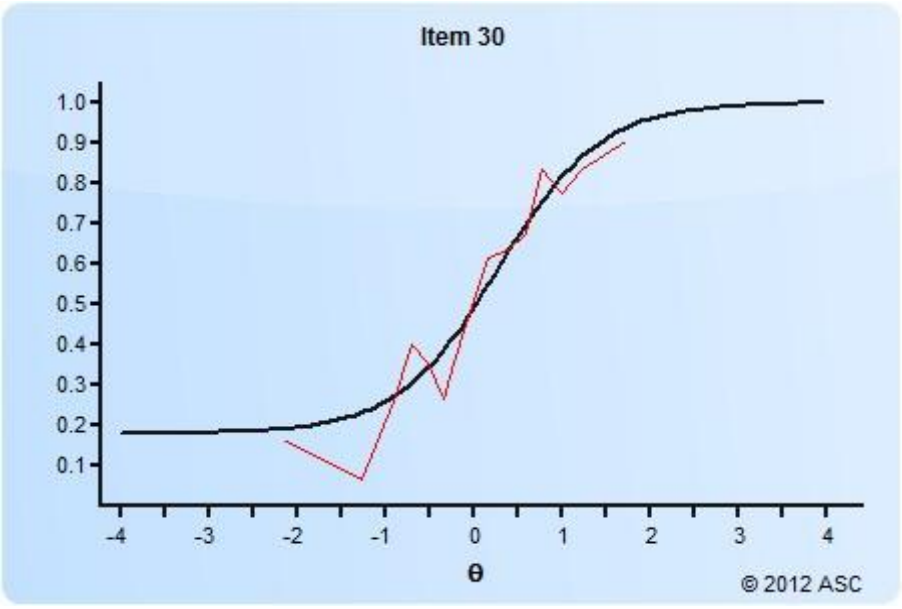
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.165	0.751	0.198	0.159	0.124	0.121	10.399	12	0.581	0.679	0.497



IRT parameters

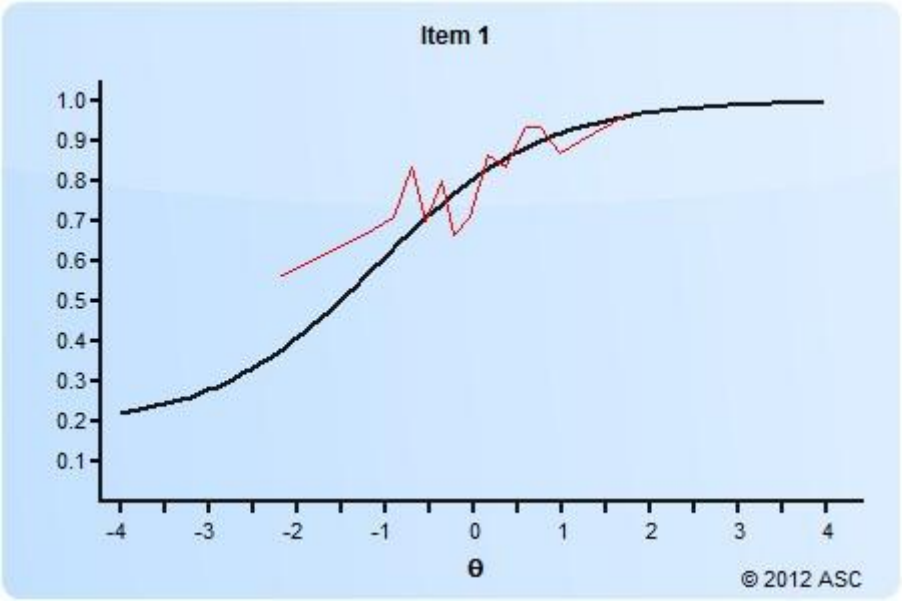
a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.355	0.613	0.189	0.151	0.107	0.120	8.944	12	0.708	0.230	0.818



IRT parameters

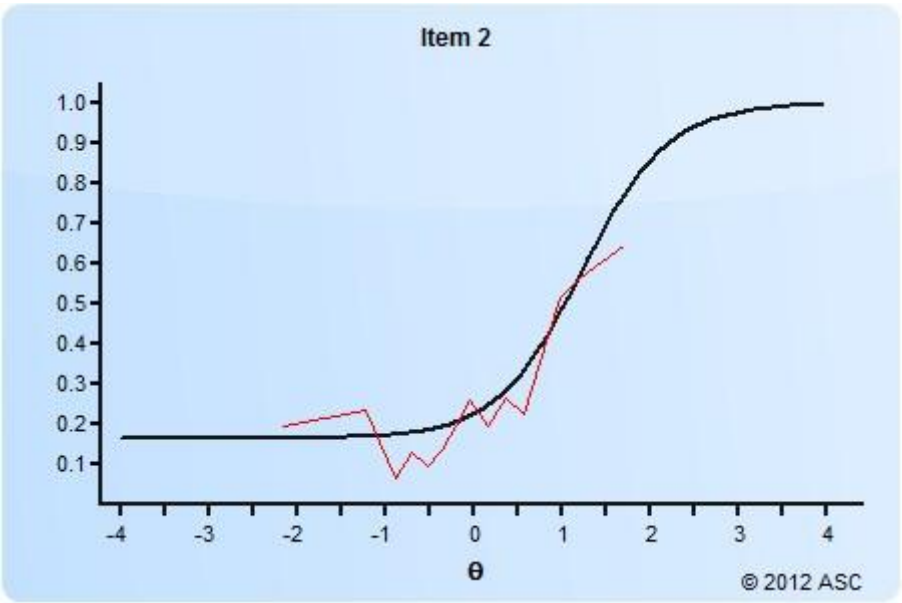
a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.706	0.360	0.180	0.134	0.086	0.122	11.130	12	0.518	0.632	0.527

APPENDIX M Item Characteristic Curves of 25 test items in pilot test



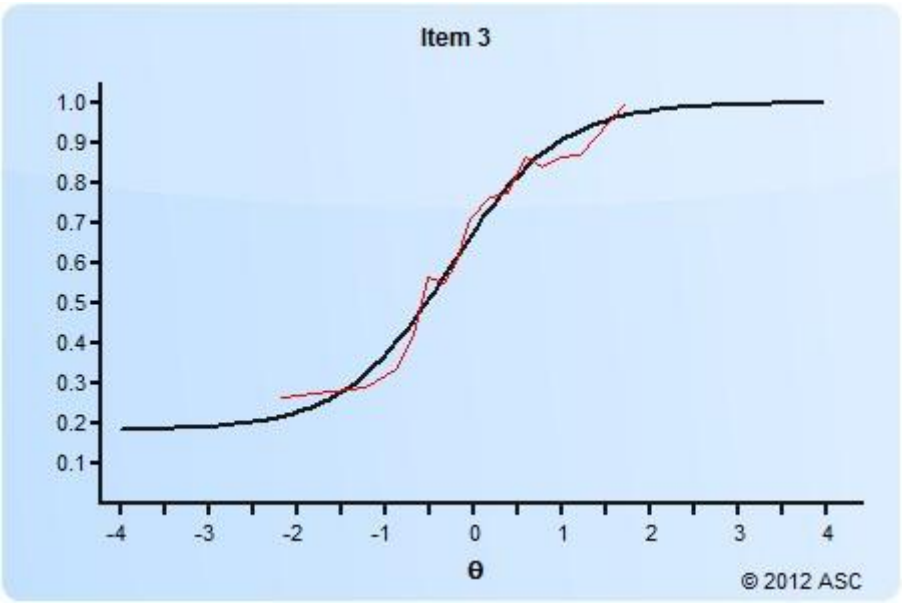
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.048	-1.035	0.186	0.110	0.126	0.214	17.610	12	0.128	0.806	0.420



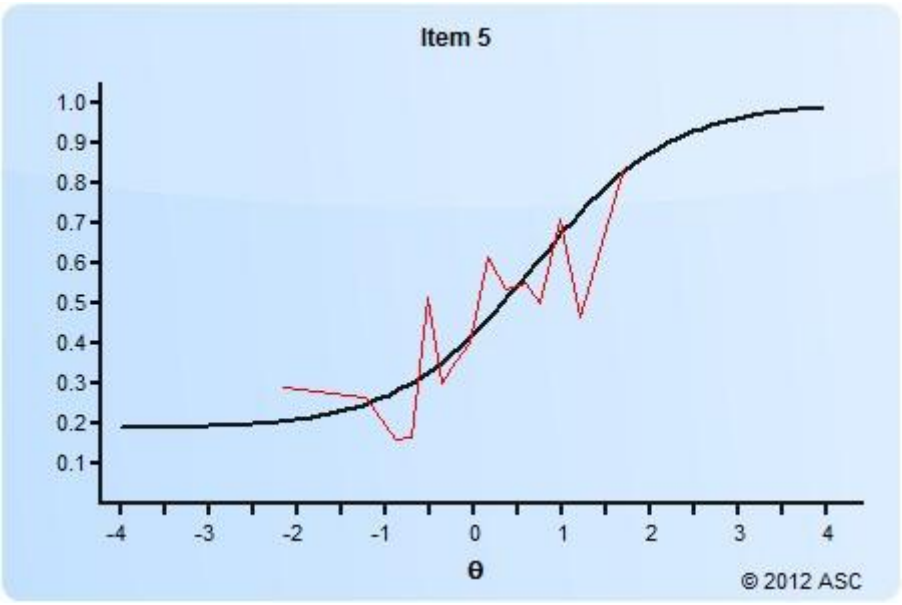
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.017	1.326	0.164	0.173	0.103	0.086	10.893	12	0.538	0.672	0.502



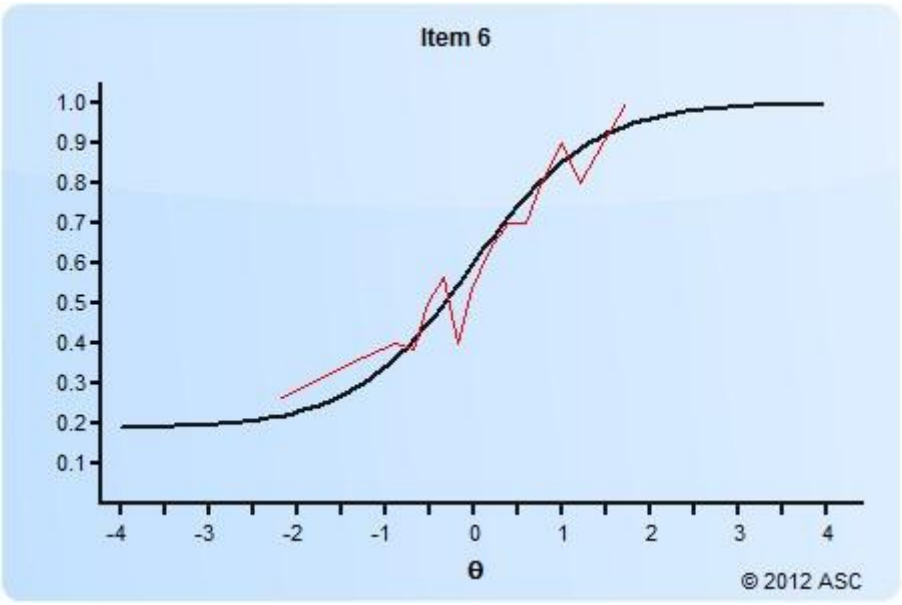
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.605	-0.198	0.183	0.123	0.086	0.155	5.669	12	0.932	0.561	0.574



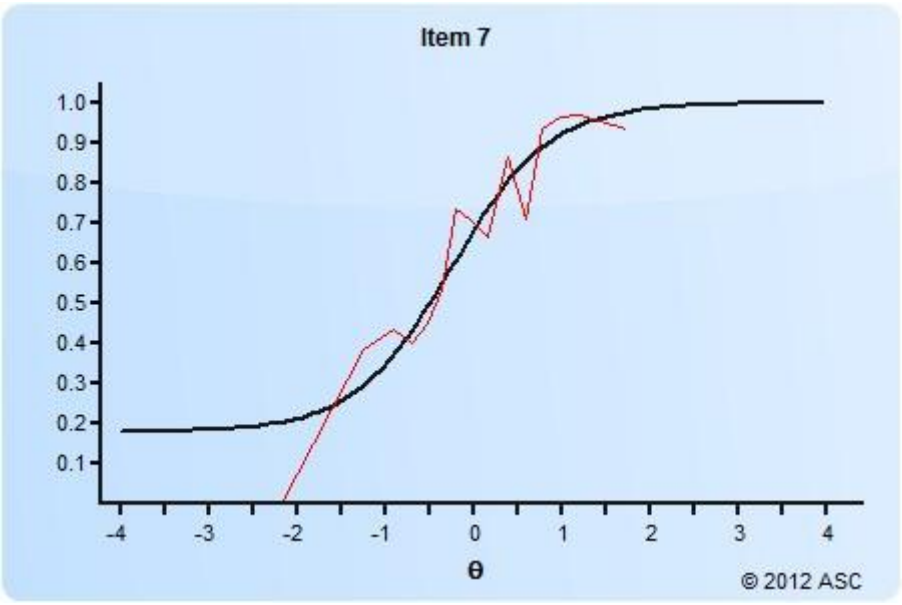
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.279	0.771	0.186	0.155	0.115	0.116	25.474	12	0.013	0.593	0.553



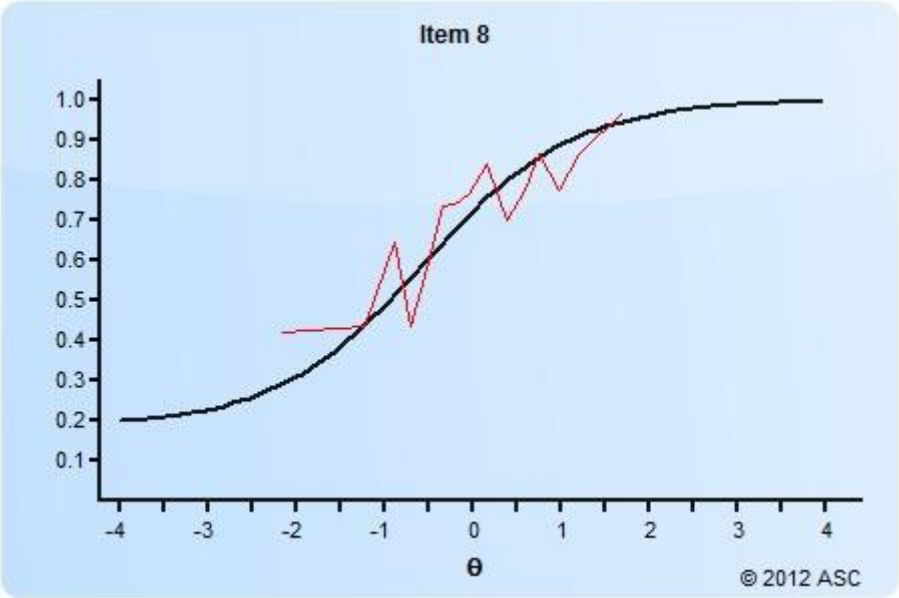
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.454	0.051	0.188	0.134	0.094	0.143	9.768	12	0.636	0.565	0.572



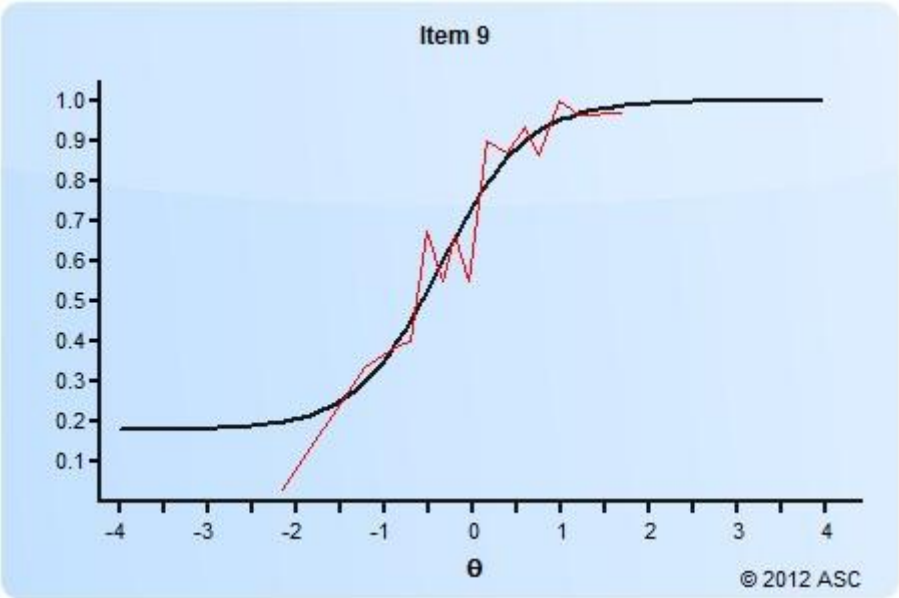
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.779	-0.187	0.179	0.120	0.080	0.151	22.968	12	0.028	0.694	0.488



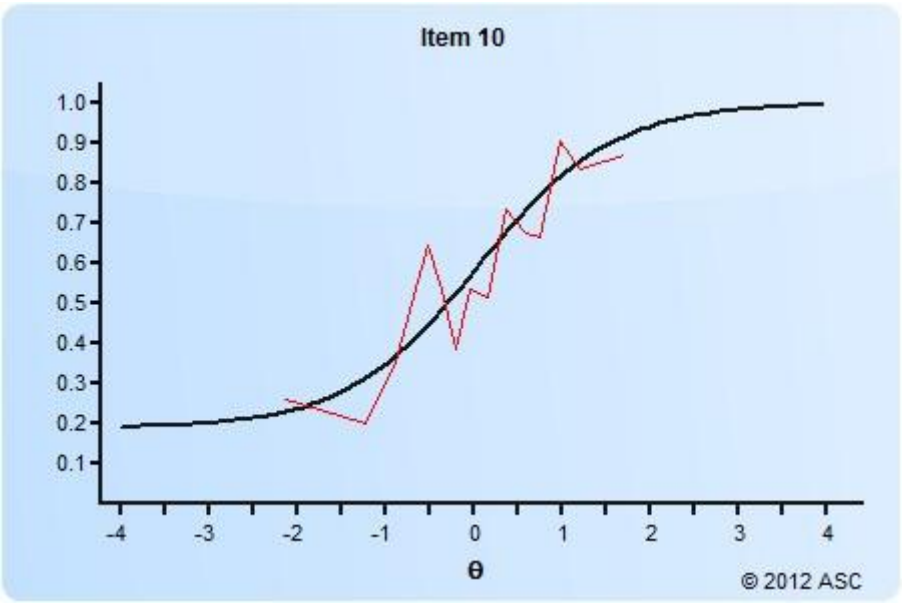
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.163	-0.490	0.185	0.126	0.111	0.179	16.827	12	0.156	0.610	0.542



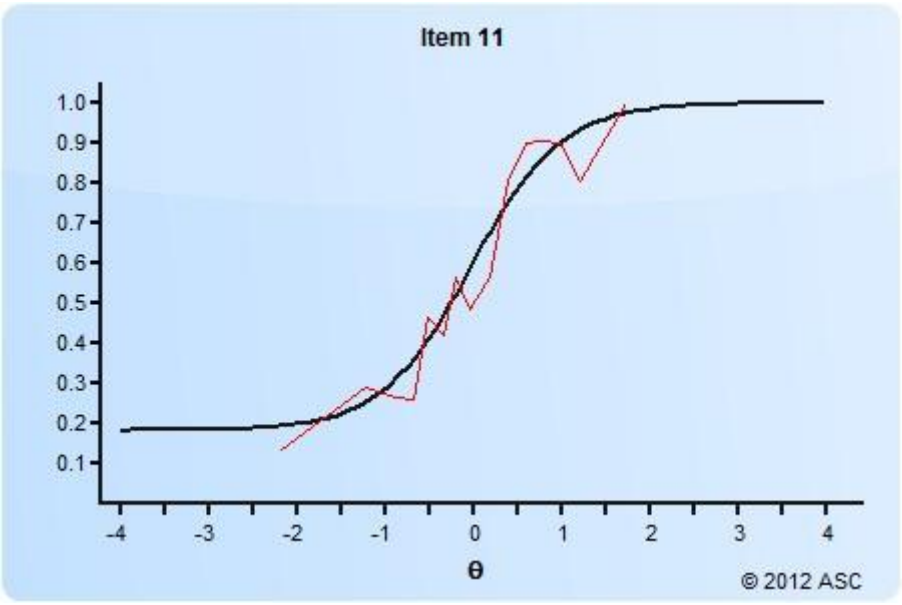
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.015	-0.299	0.179	0.115	0.073	0.155	20.545	12	0.057	1.279	0.201



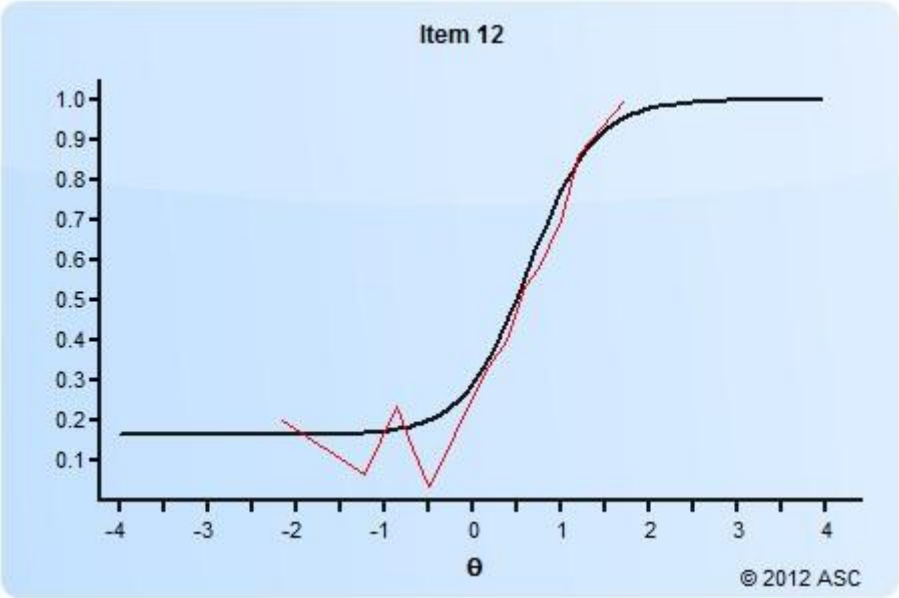
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.301	0.127	0.188	0.142	0.103	0.142	16.990	12	0.150	0.490	0.624



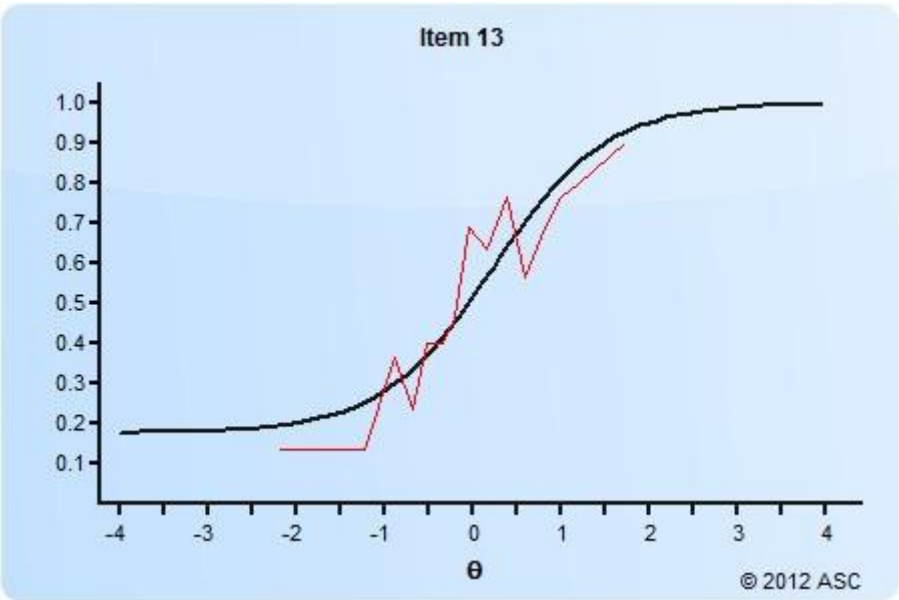
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.927	0.038	0.182	0.123	0.076	0.136	16.302	12	0.178	0.973	0.330



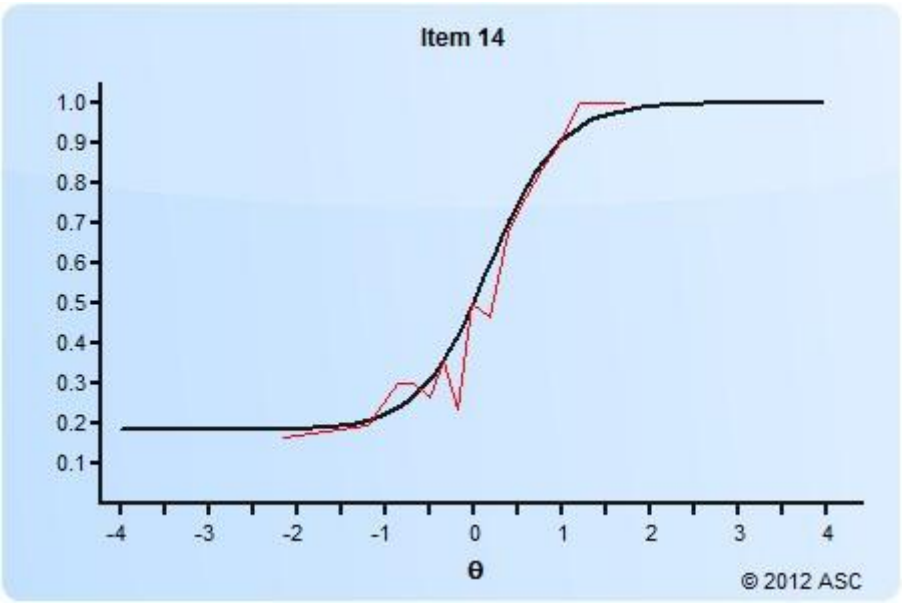
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.623	0.723	0.163	0.150	0.069	0.095	14.563	12	0.266	1.302	0.193



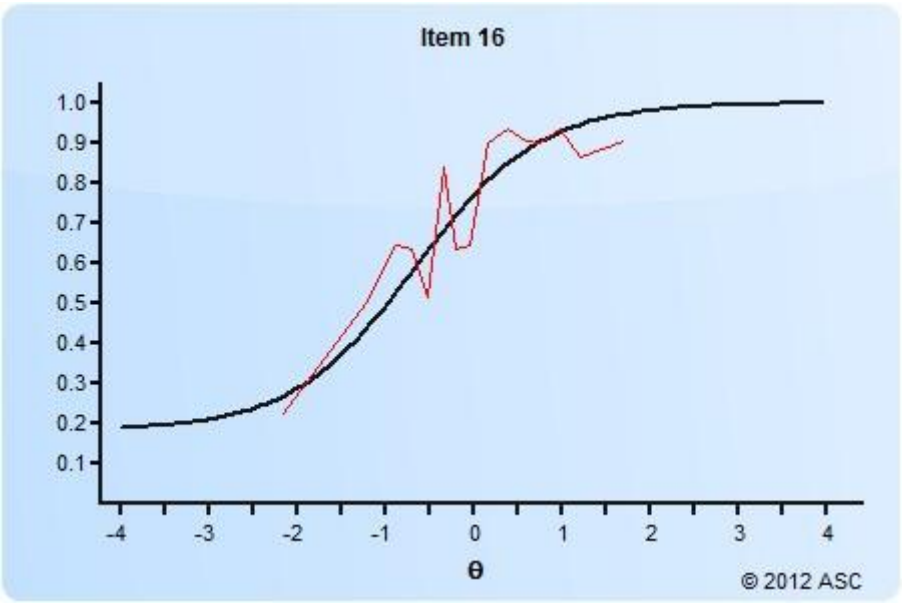
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.531	0.304	0.176	0.137	0.091	0.128	16.682	12	0.162	0.686	0.493



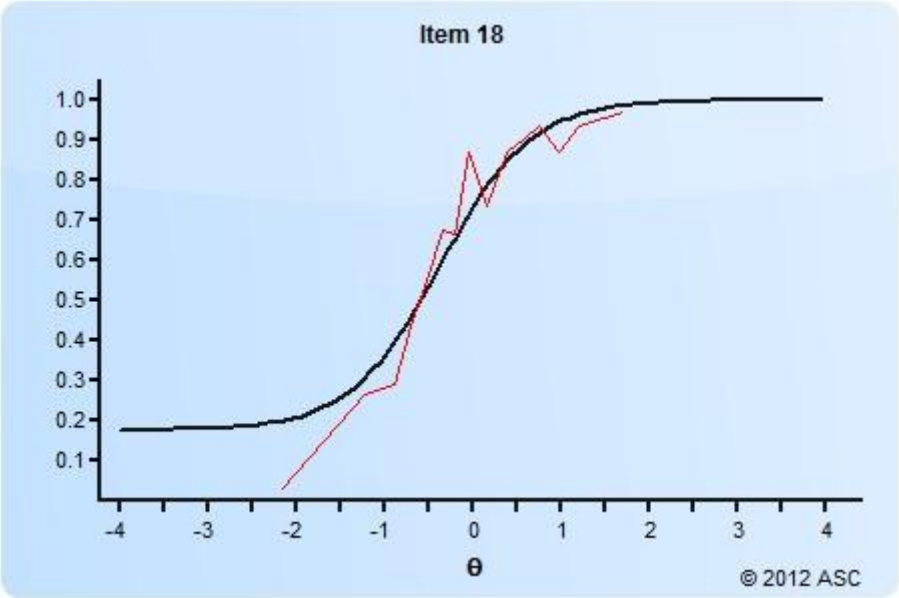
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.448	0.253	0.183	0.126	0.067	0.118	8.793	12	0.720	0.439	0.661



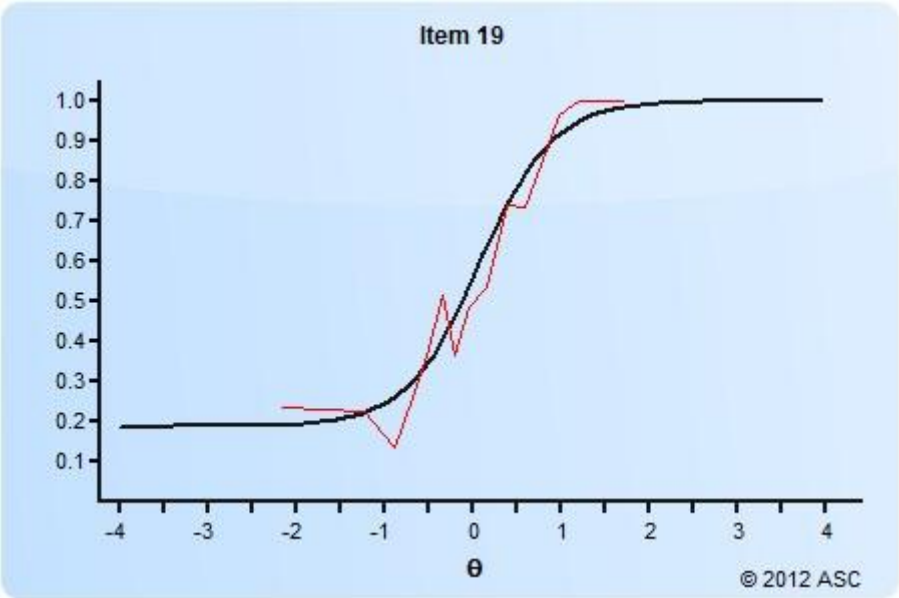
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.395	-0.600	0.182	0.115	0.097	0.184	23.867	12	0.021	0.872	0.383



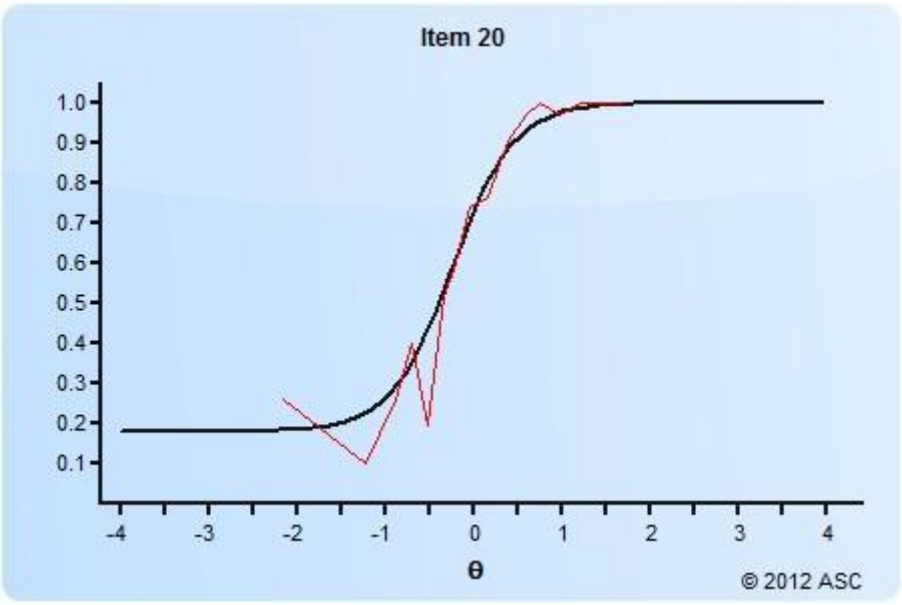
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.918	-0.304	0.175	0.116	0.075	0.156	16.985	12	0.150	1.203	0.229



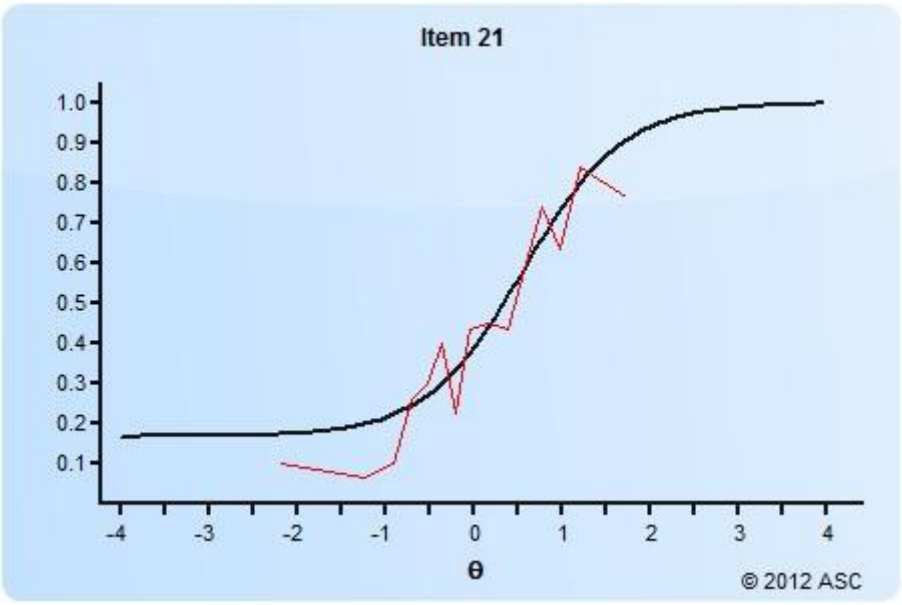
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.354	0.149	0.187	0.124	0.068	0.125	11.454	12	0.490	1.492	0.136



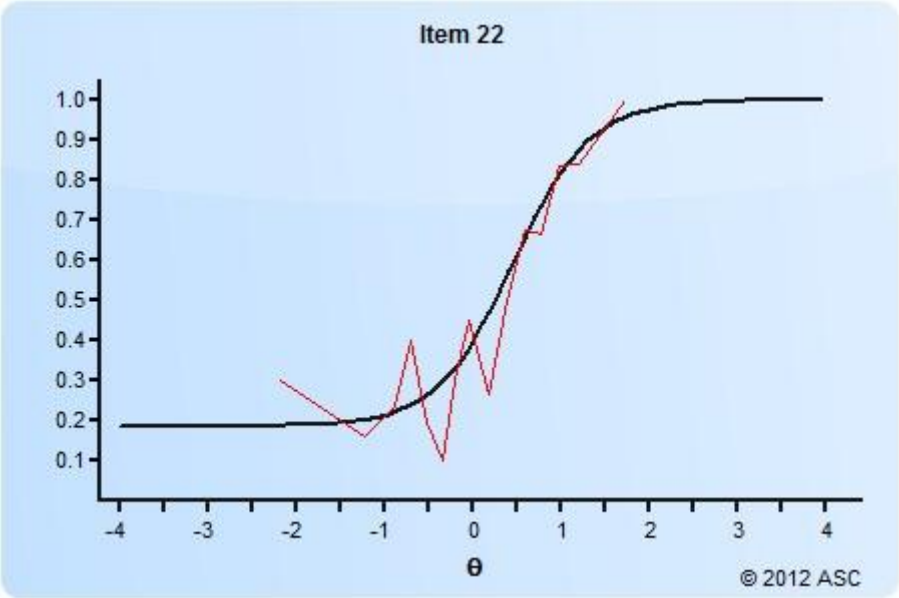
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.813	-0.174	0.180	0.118	0.059	0.138	14.725	12	0.257	0.446	0.656



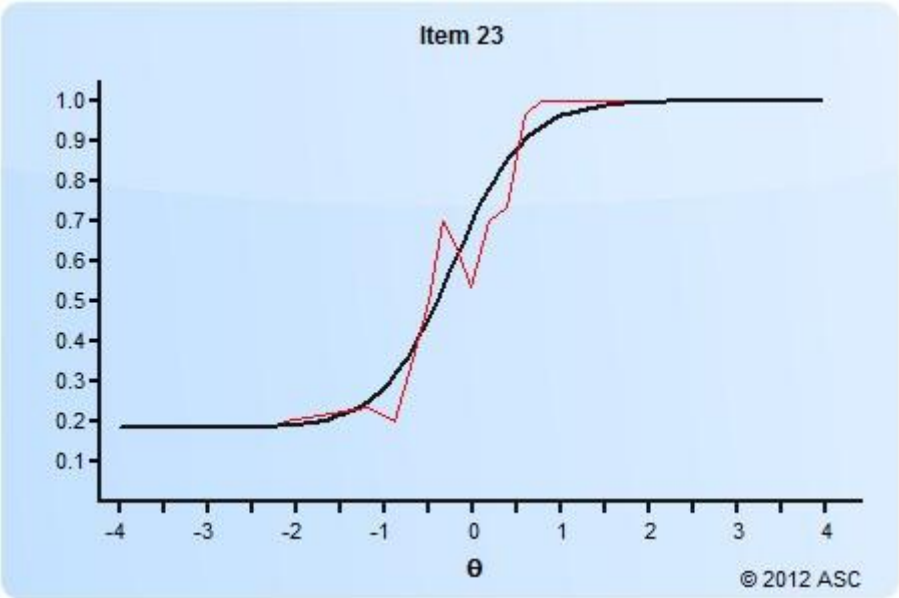
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.759	0.650	0.167	0.143	0.088	0.108	20.152	12	0.064	0.730	0.465



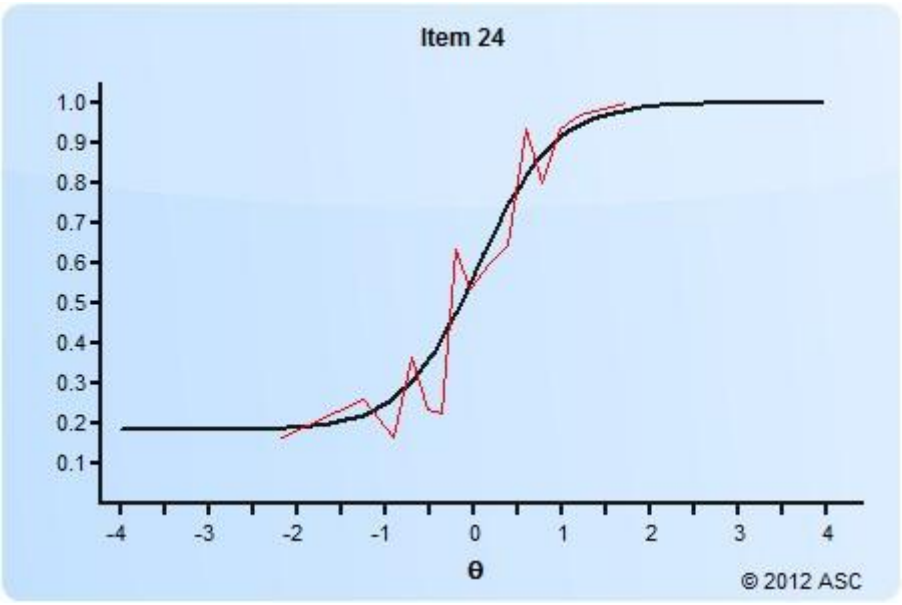
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.257	0.537	0.186	0.141	0.074	0.108	20.740	12	0.054	0.944	0.345



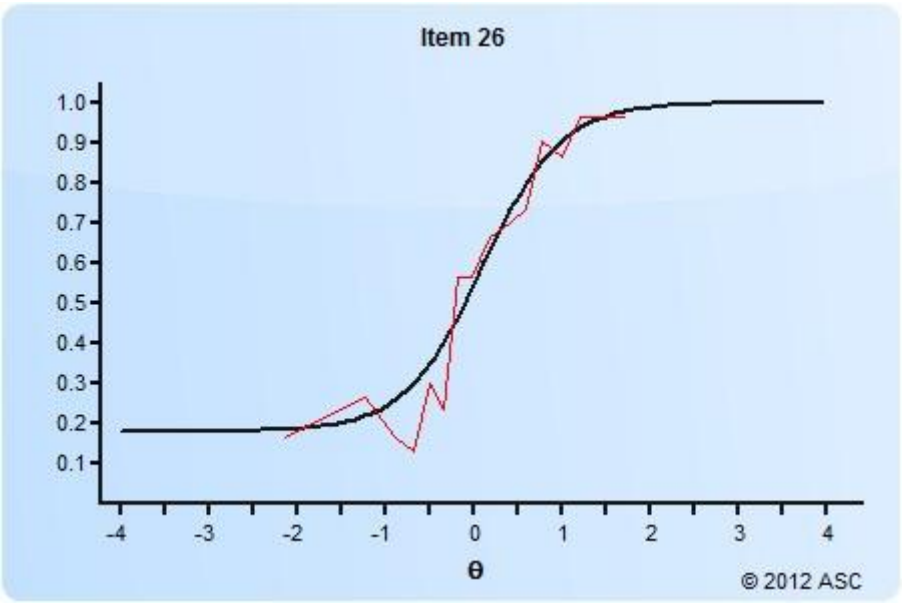
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.432	-0.154	0.183	0.117	0.065	0.141	18.355	12	0.105	0.664	0.507



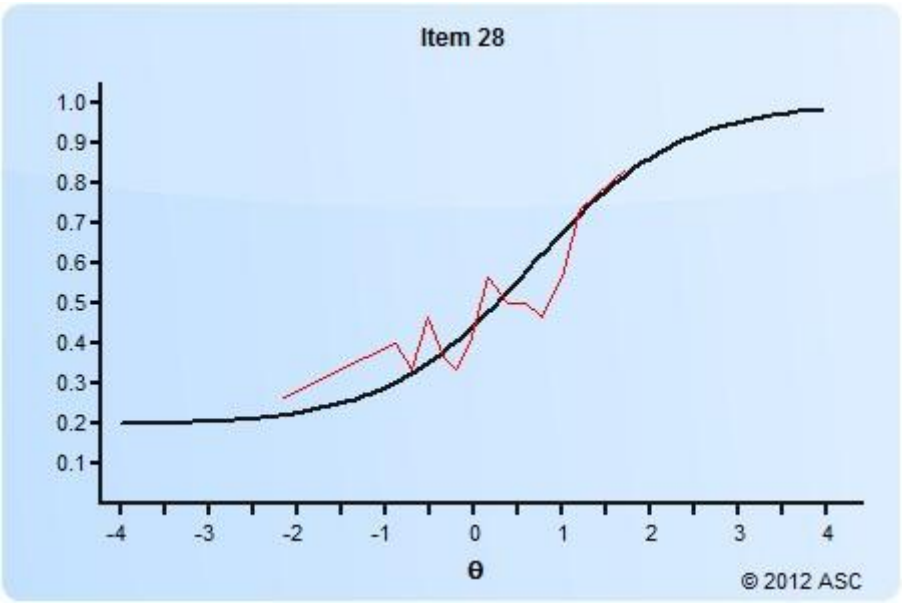
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.257	0.122	0.182	0.123	0.070	0.127	18.001	12	0.116	0.370	0.711



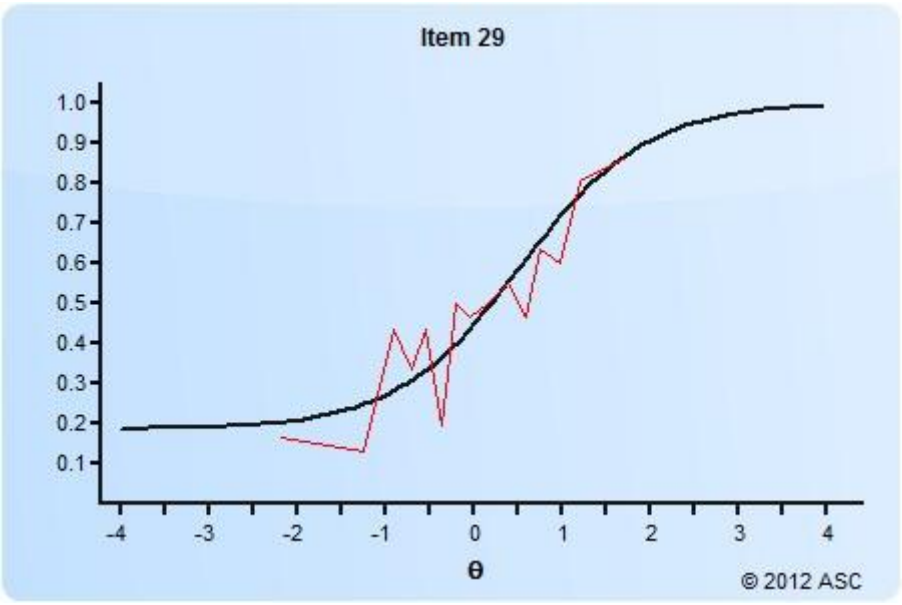
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.216	0.172	0.180	0.124	0.071	0.124	13.879	12	0.309	1.166	0.243



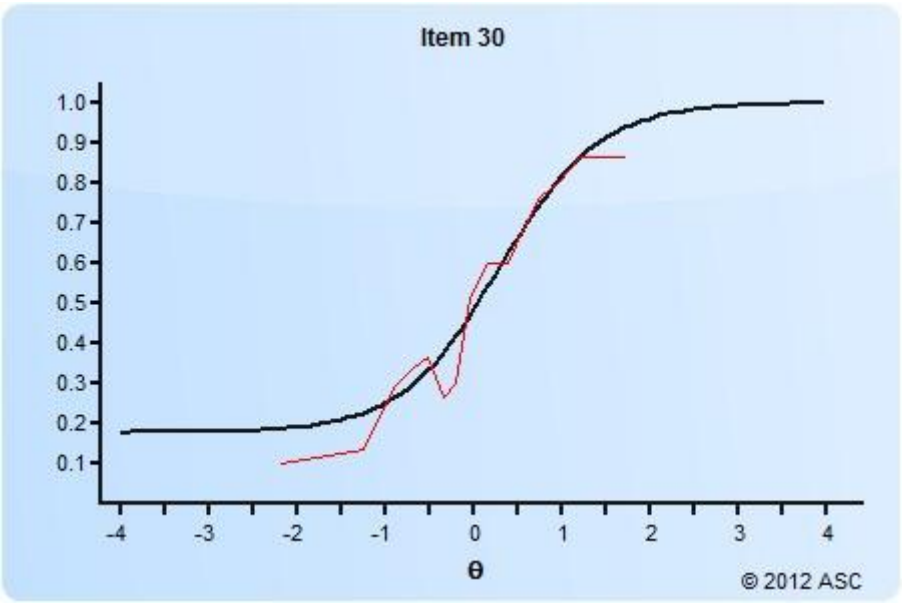
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.173	0.757	0.195	0.159	0.123	0.121	11.428	12	0.493	0.718	0.473



IRT parameters

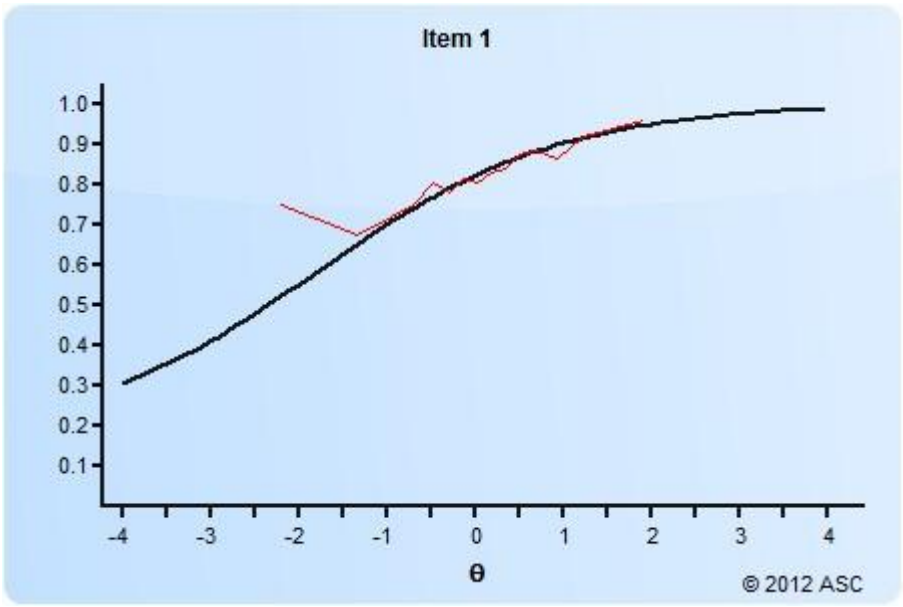
a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.372	0.616	0.185	0.151	0.106	0.120	17.201	12	0.142	0.290	0.772



IRT parameters

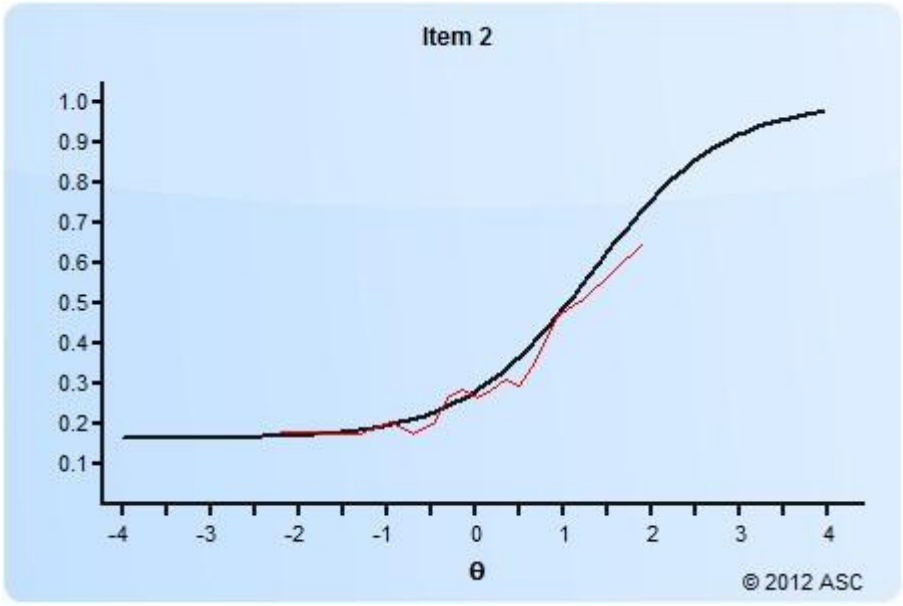
a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.747	0.369	0.177	0.135	0.084	0.121	9.831	12	0.631	0.581	0.561

Appendix N Item Characteristic Curves (main study)



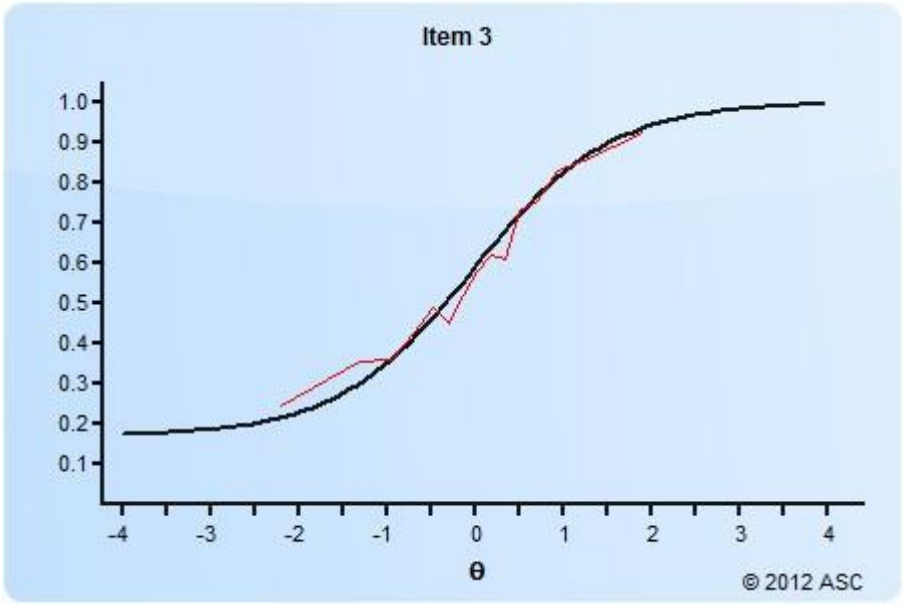
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.718	-1.752	0.168	0.040	0.070	0.103	49.540	12	0.000	0.592	0.554



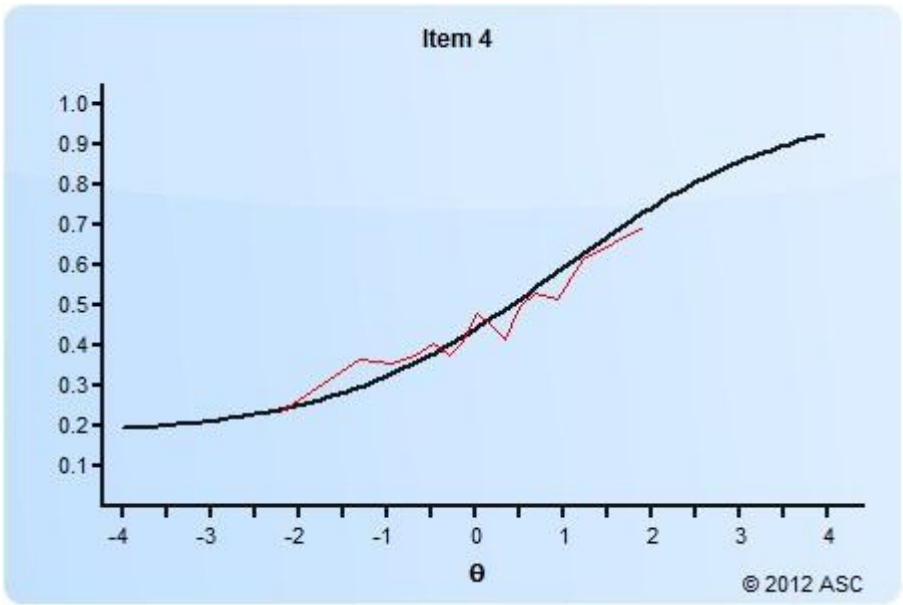
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.328	1.431	0.162	0.056	0.053	0.037	14.146	12	0.291	0.411	0.681



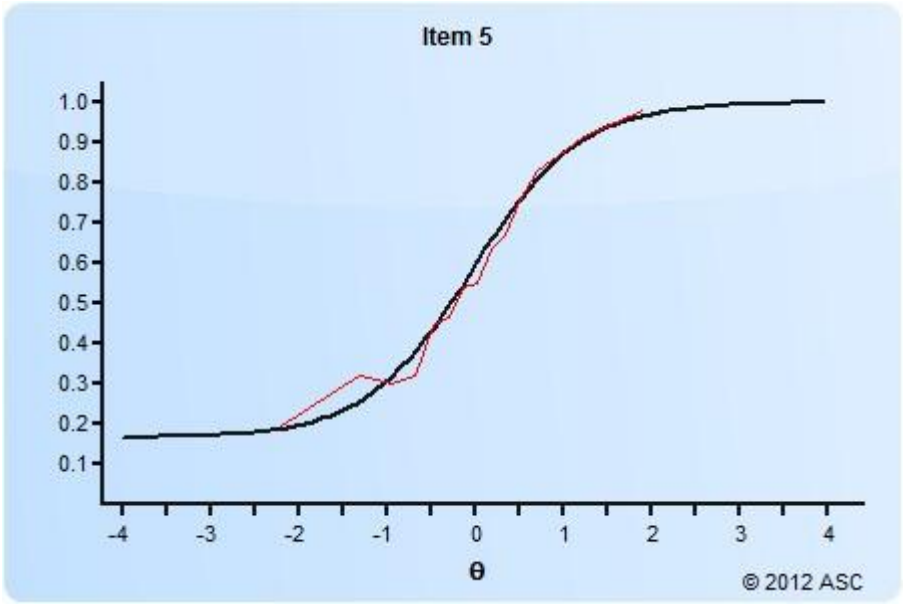
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.267	0.049	0.169	0.055	0.040	0.058	13.344	12	0.345	0.623	0.533



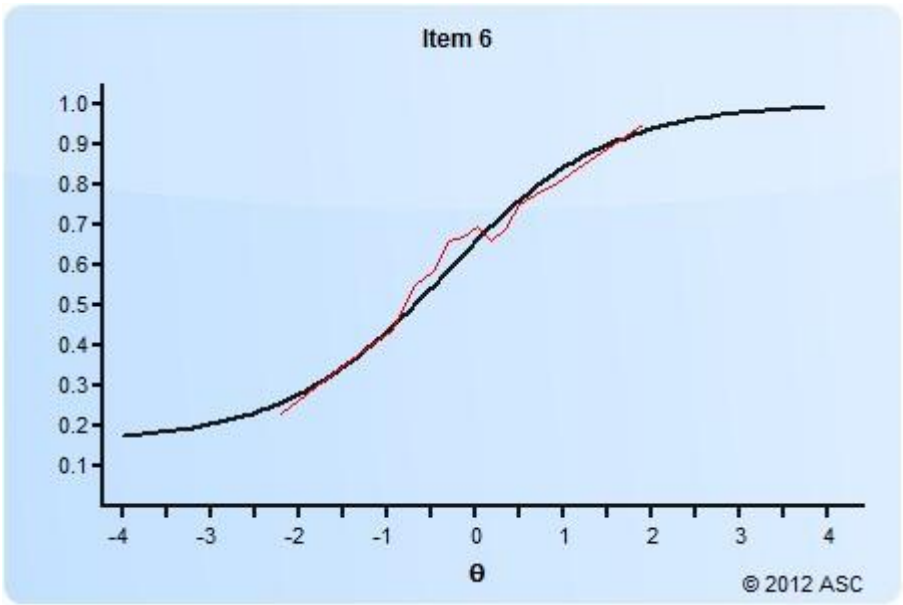
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.755	1.058	0.175	0.063	0.069	0.049	16.038	12	0.189	0.787	0.431



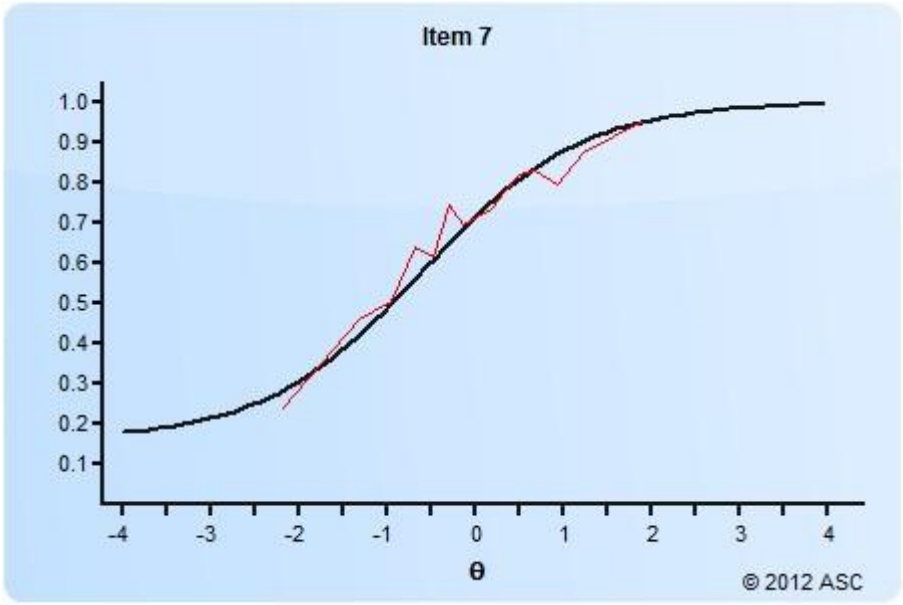
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.613	0.035	0.165	0.051	0.033	0.055	14.059	12	0.297	0.410	0.682



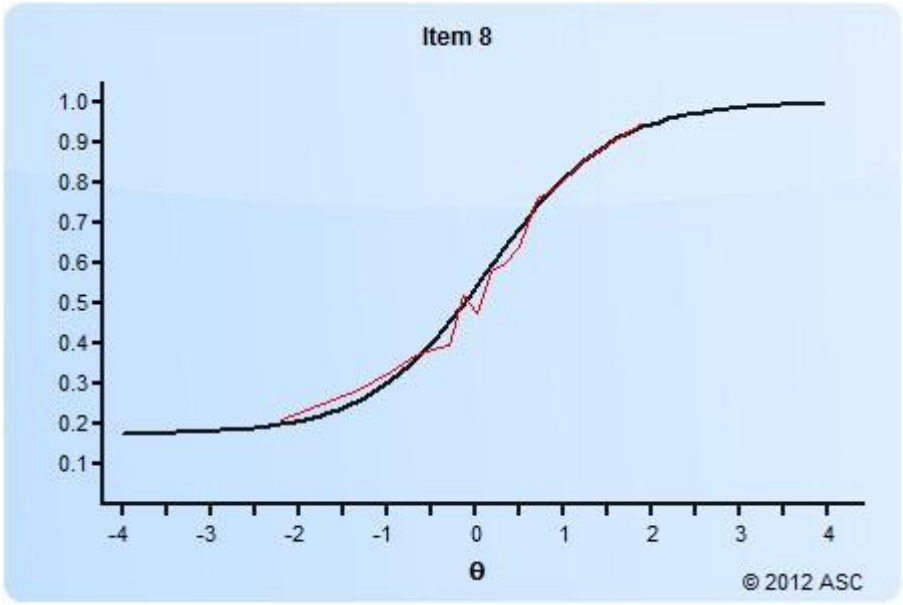
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.067	-0.276	0.160	0.054	0.045	0.067	18.883	12	0.091	0.999	0.318



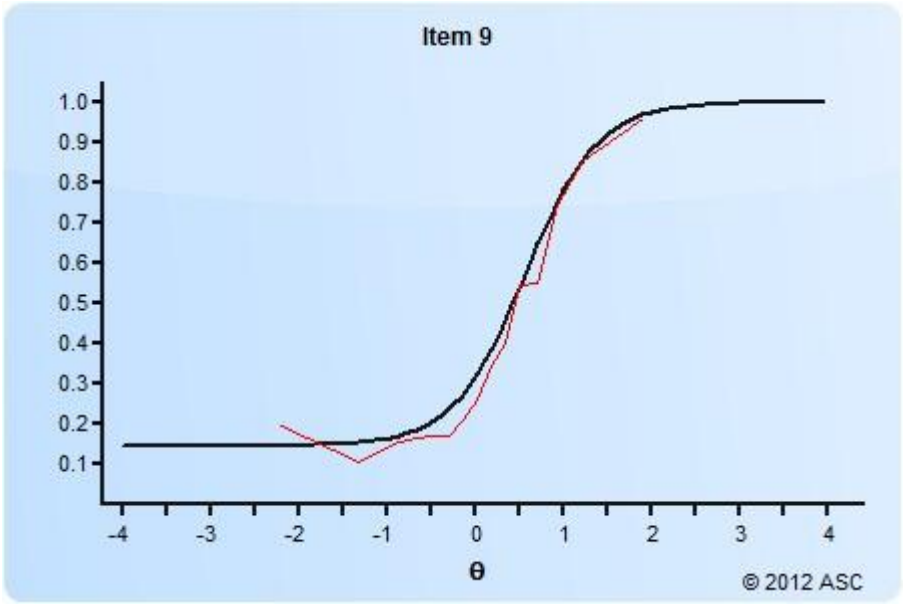
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.091	-0.541	0.159	0.048	0.044	0.073	29.068	12	0.004	1.063	0.288



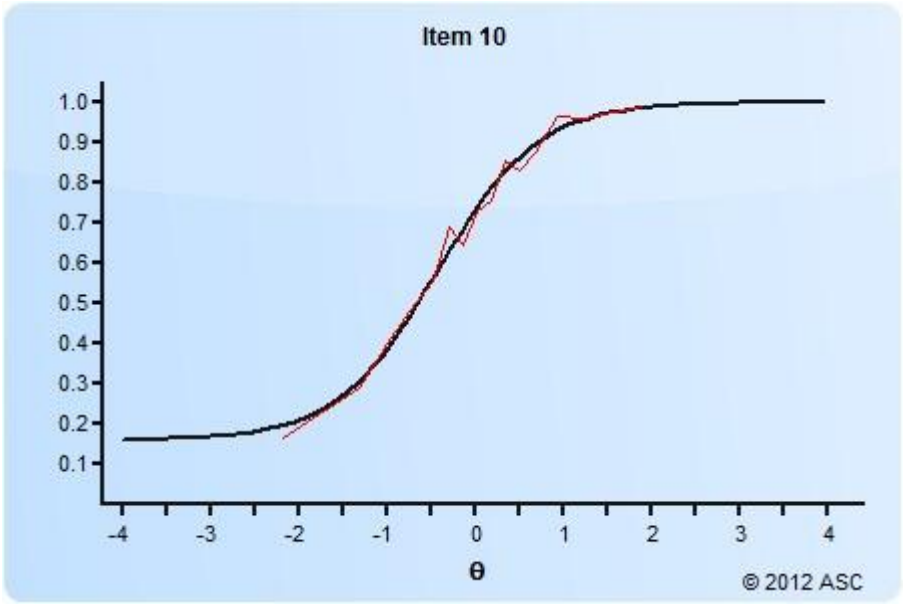
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.426	0.241	0.173	0.056	0.037	0.053	11.052	12	0.524	0.639	0.523



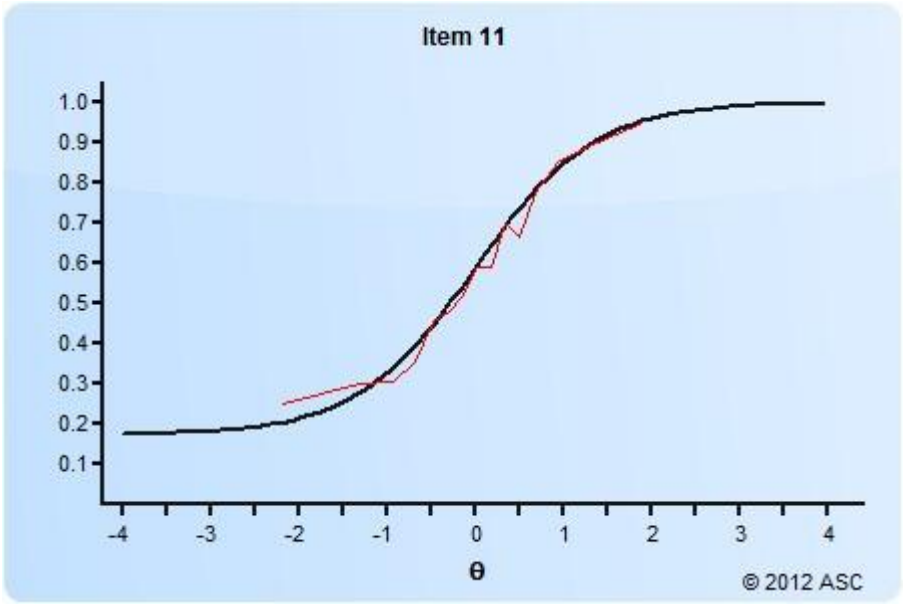
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
2.399	0.652	0.146	0.055	0.027	0.038	25.146	12	0.014	0.599	0.549



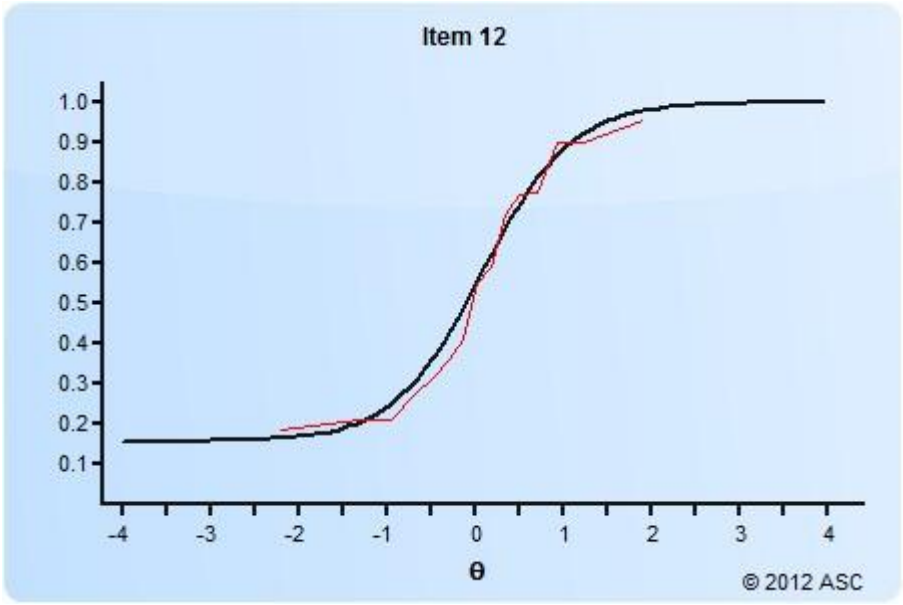
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.724	-0.372	0.159	0.044	0.031	0.065	17.414	12	0.135	0.550	0.582



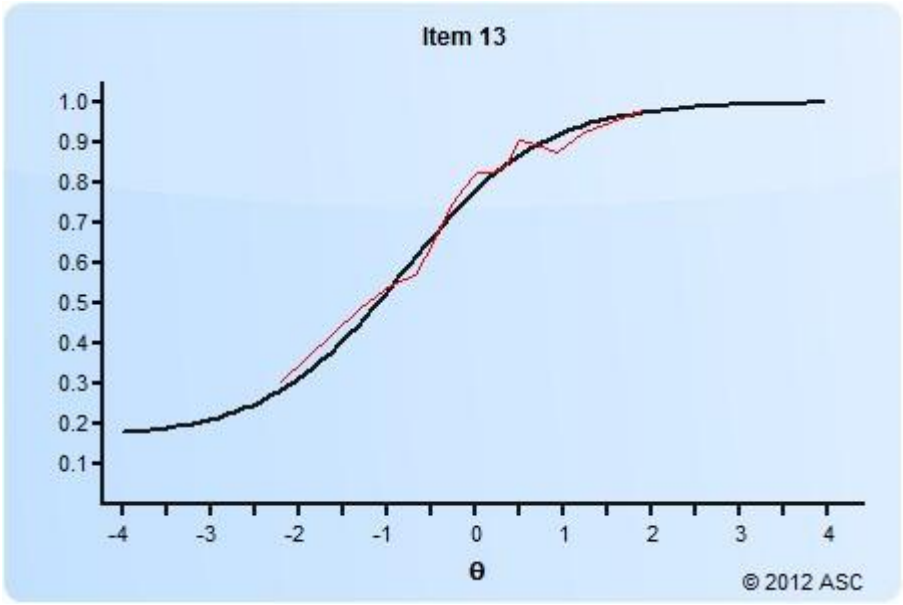
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.452	0.064	0.173	0.053	0.036	0.056	11.666	12	0.473	0.472	0.637



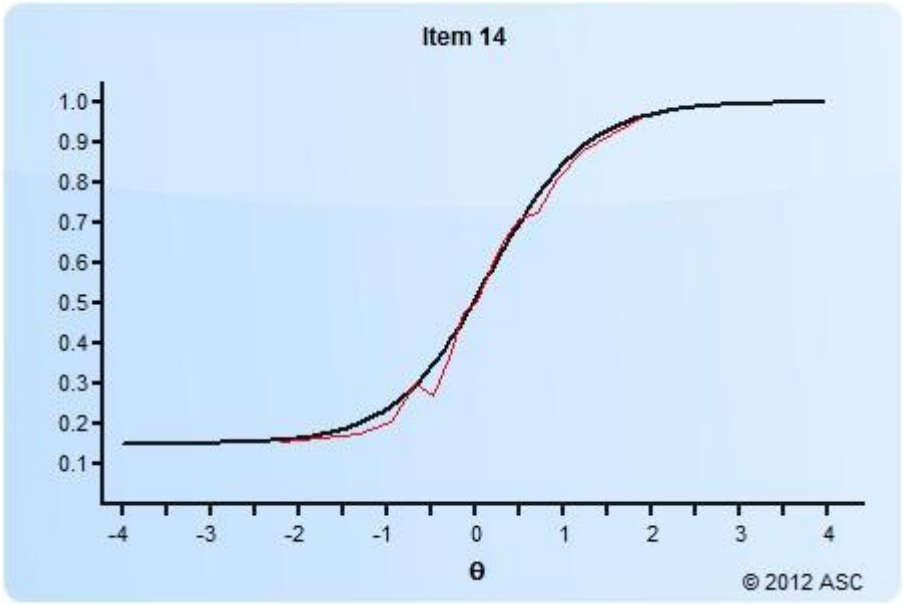
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.961	0.156	0.156	0.050	0.028	0.049	20.966	12	0.051	0.470	0.639



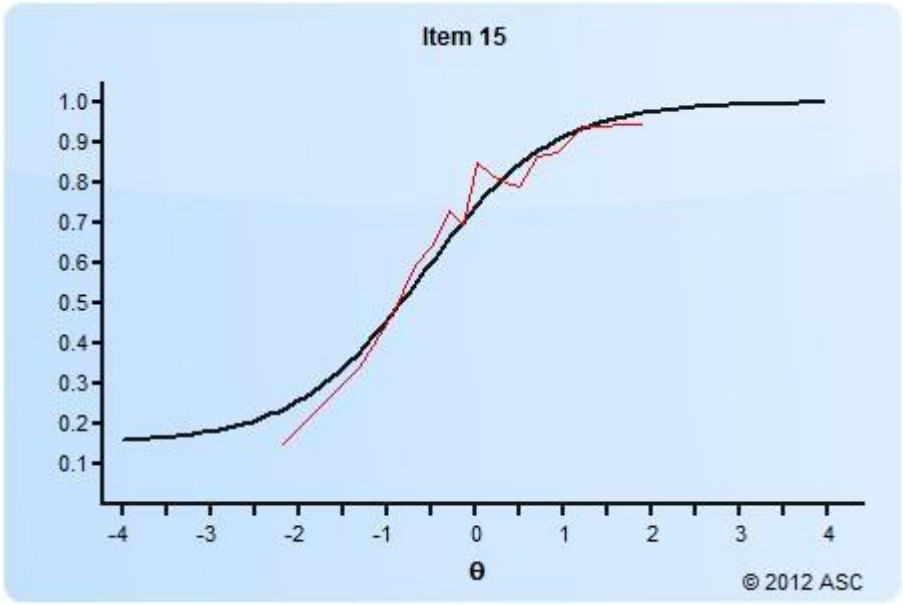
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.259	-0.748	0.164	0.043	0.041	0.079	18.444	12	0.103	0.660	0.509



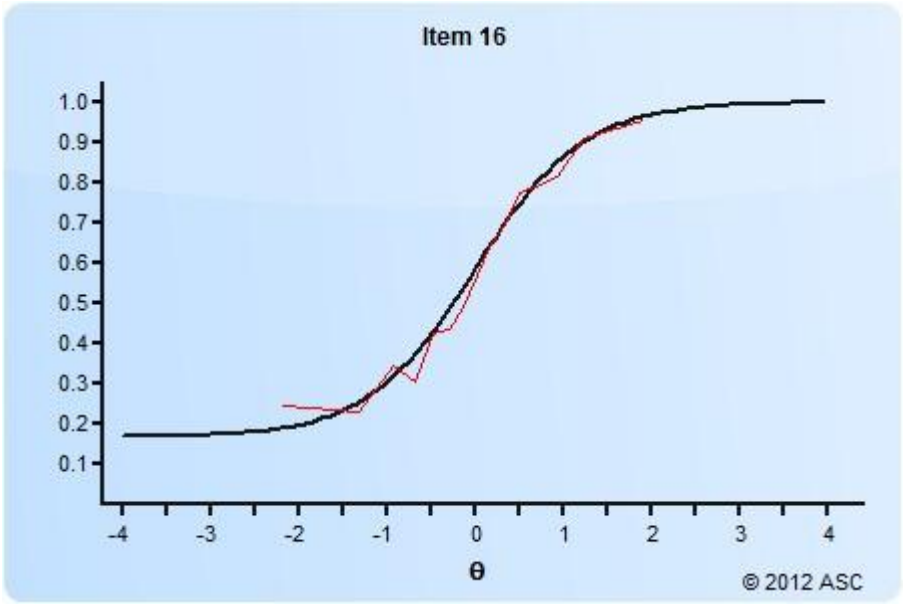
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.802	0.244	0.150	0.051	0.030	0.048	10.612	12	0.562	0.485	0.628



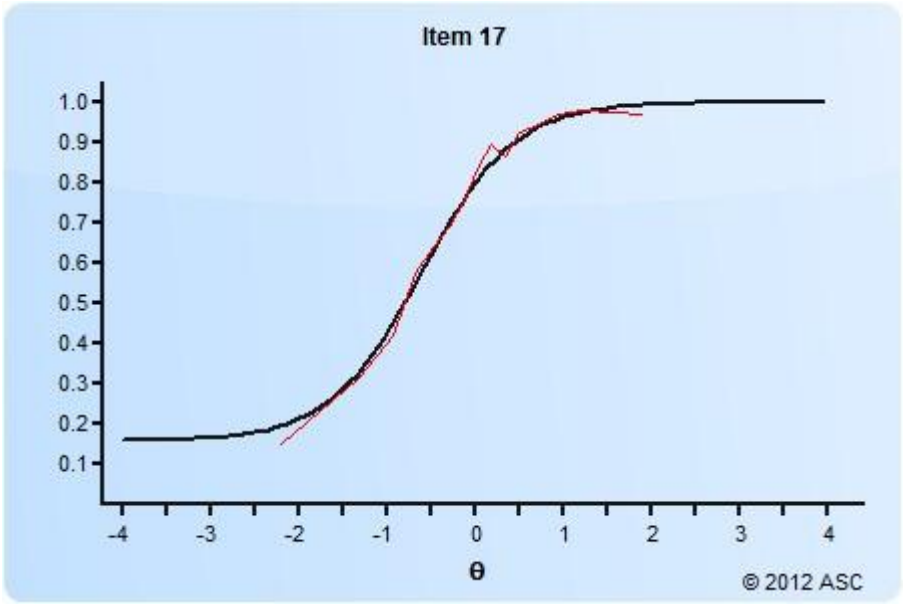
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.353	-0.524	0.152	0.045	0.037	0.071	46.465	12	0.000	1.359	0.174



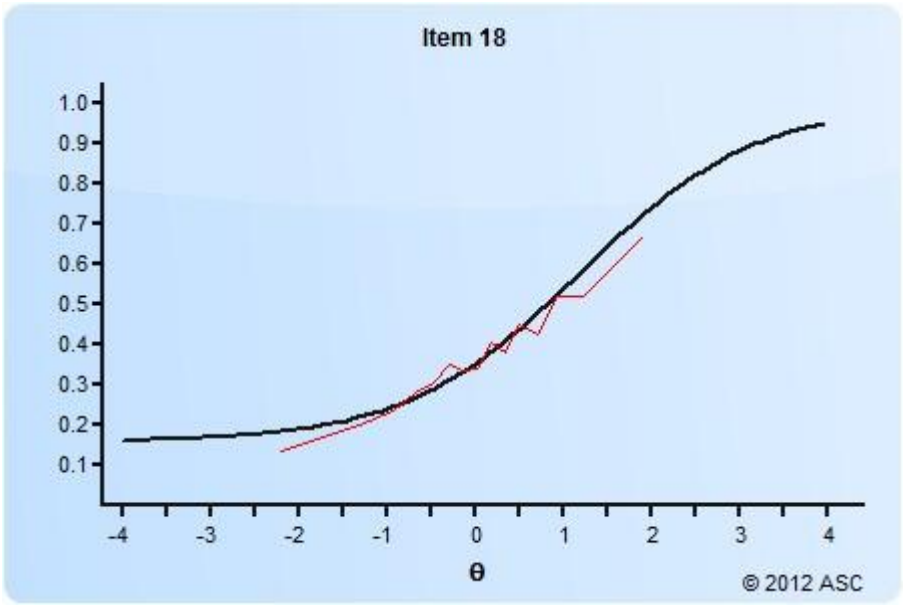
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.601	0.063	0.166	0.051	0.033	0.055	15.244	12	0.228	0.384	0.701



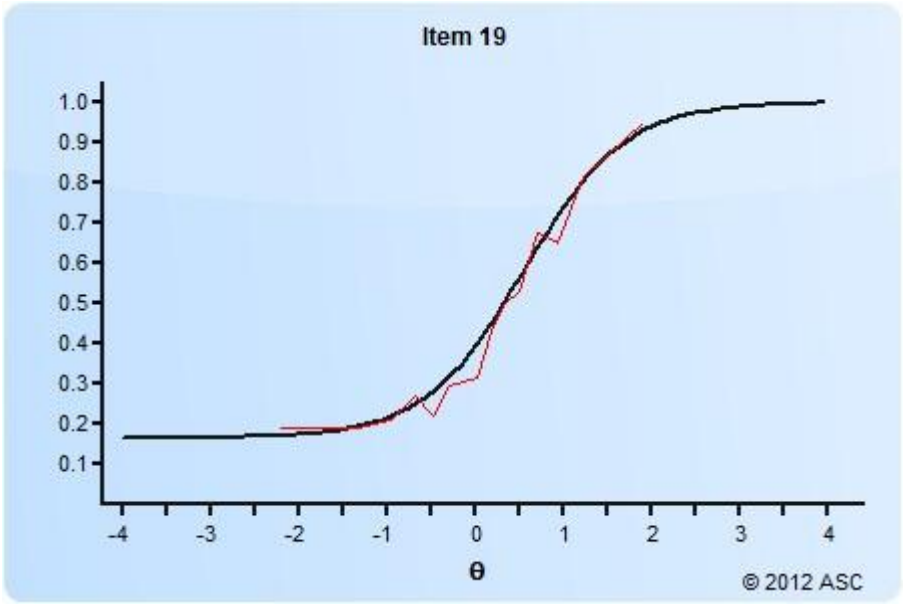
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.877	-0.546	0.157	0.042	0.030	0.069	29.066	12	0.004	0.568	0.570



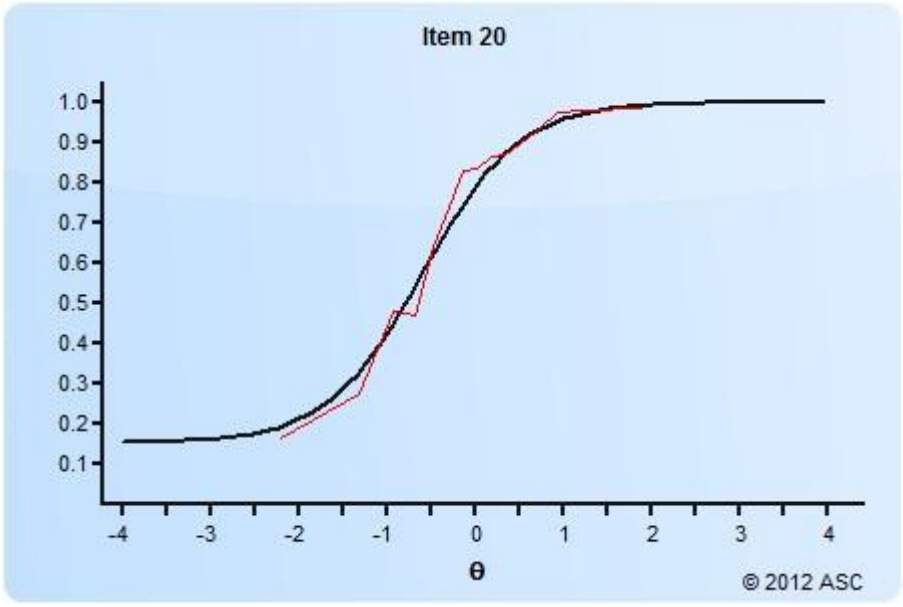
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.986	1.286	0.157	0.055	0.059	0.042	12.666	12	0.394	0.625	0.532



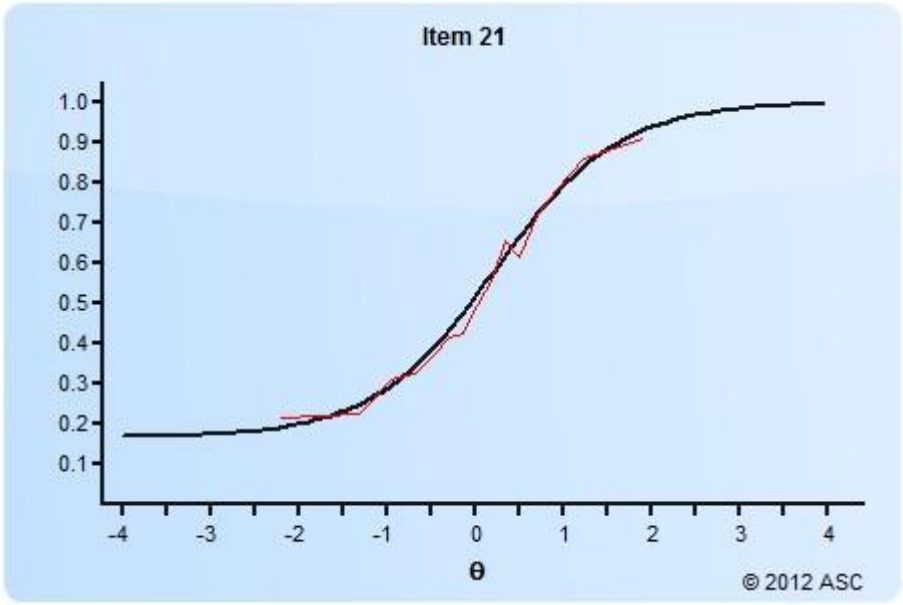
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.734	0.634	0.165	0.056	0.034	0.043	18.625	12	0.098	0.530	0.596



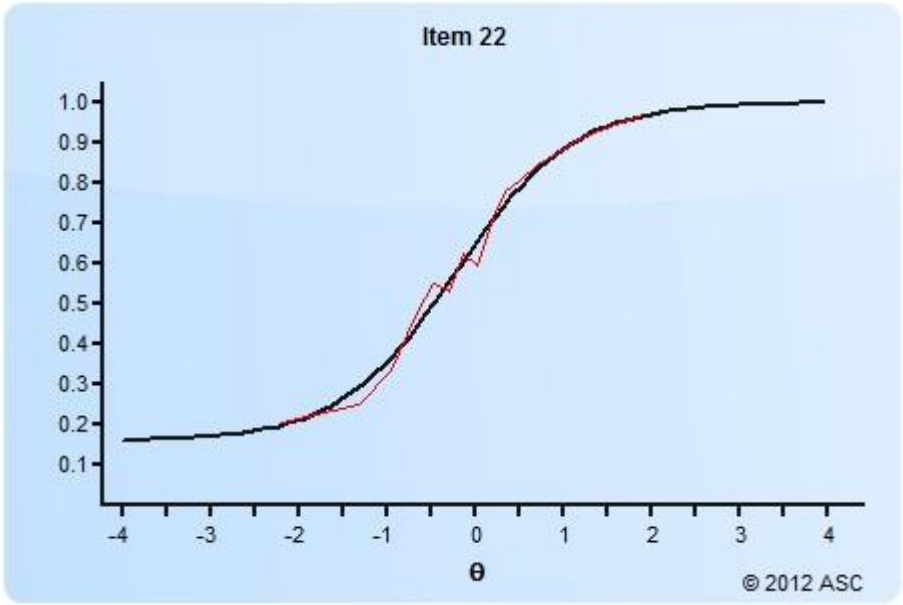
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.811	-0.535	0.152	0.042	0.030	0.069	32.345	12	0.001	0.661	0.509



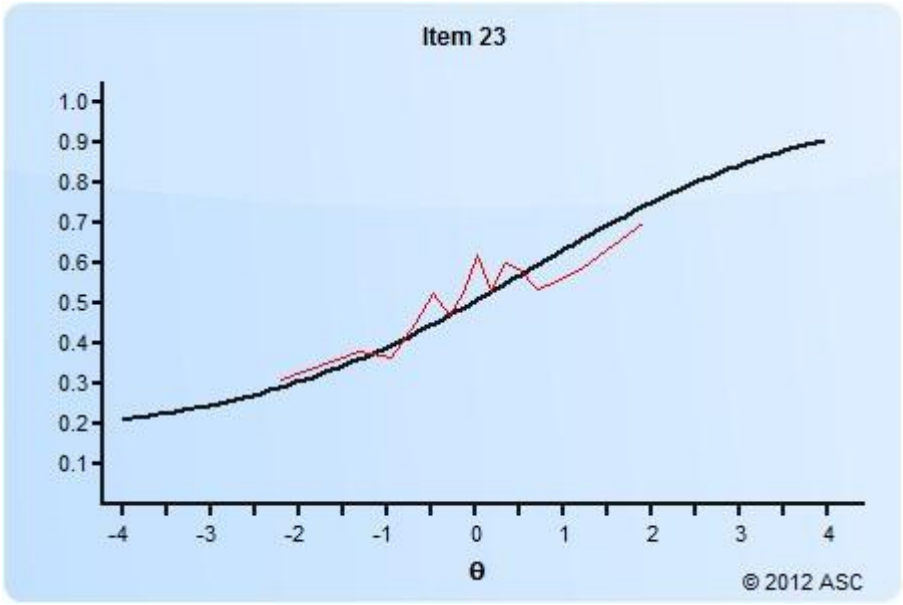
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.404	0.304	0.166	0.056	0.037	0.051	9.135	12	0.691	0.354	0.723



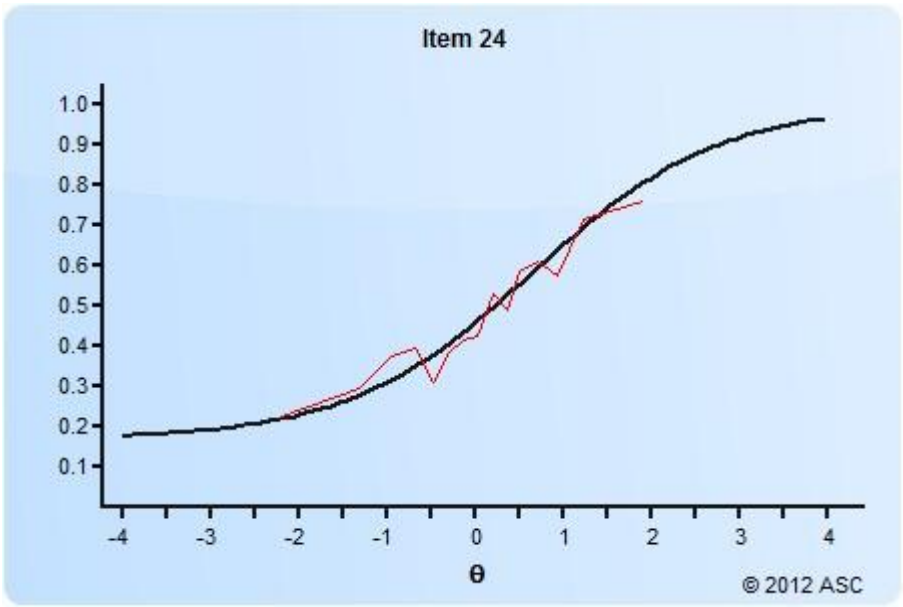
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.482	-0.152	0.159	0.049	0.034	0.060	14.119	12	0.293	0.228	0.819



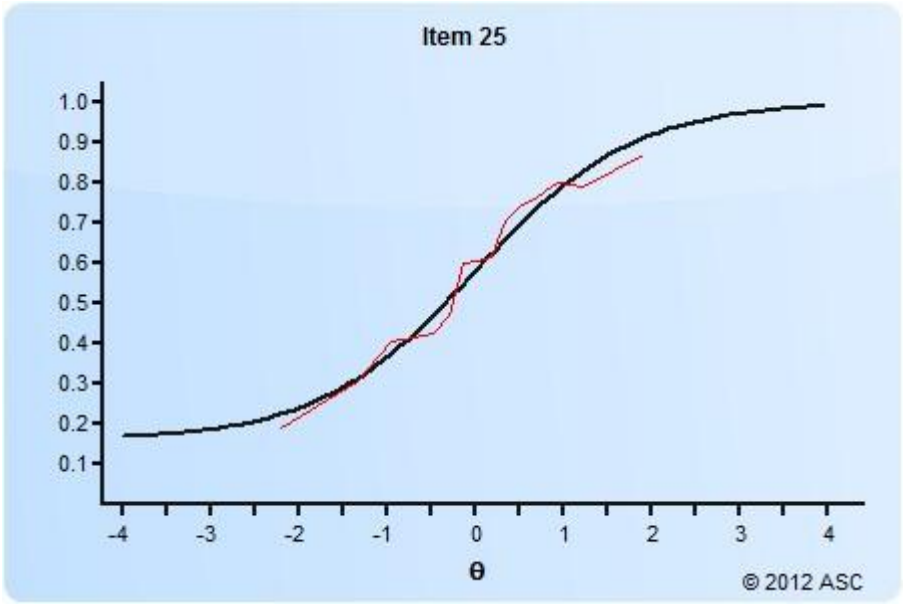
IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.603	0.688	0.165	0.077	0.078	0.056	32.822	12	0.001	1.156	0.248



IRT parameters

a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
0.933	0.738	0.167	0.063	0.055	0.050	20.331	12	0.061	0.439	0.661

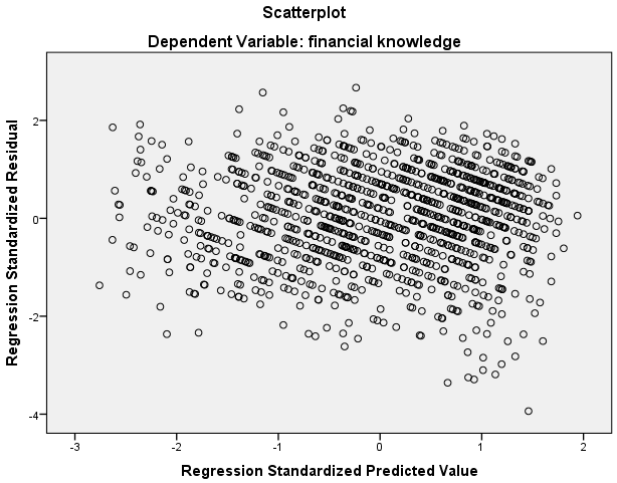


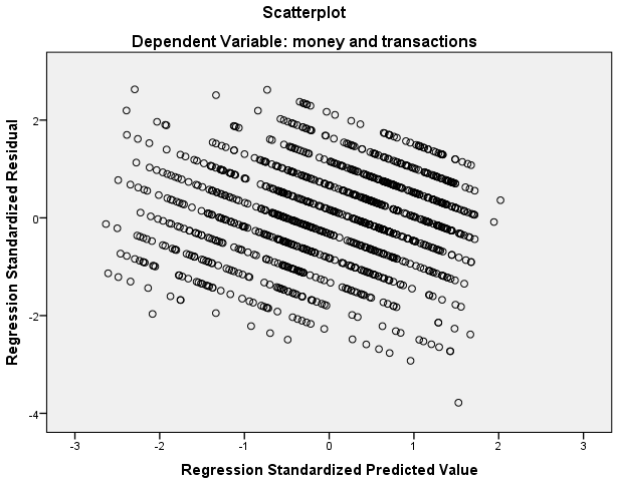
IRT parameters

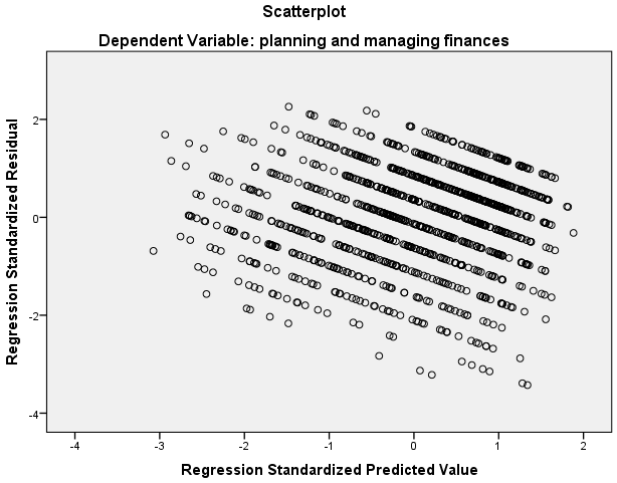
a	*b*	*c*	*a SE*	*b SE*	*c SE*	*Chi-sq*	*df*	*p*	*z Resid*	*p*
1.097	0.068	0.158	0.058	0.044	0.059	21.079	12	0.049	0.692	0.489

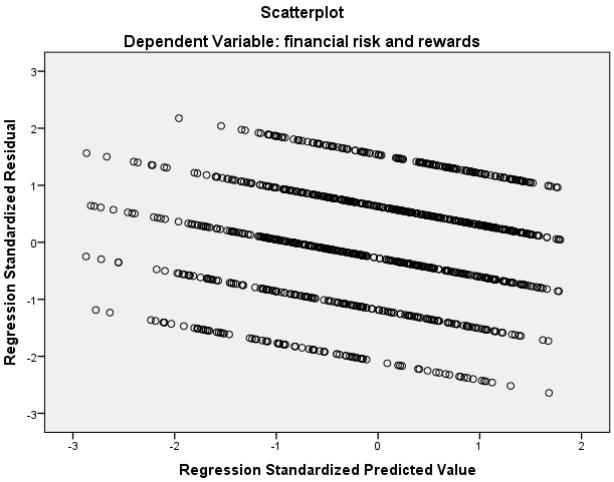
Appendix P Assumptions of multiple linear regressions (financial knowledge and skills)

Evidence of homoscedasticity

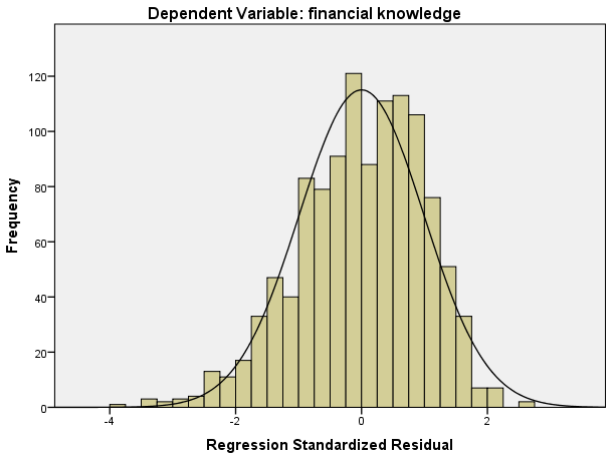


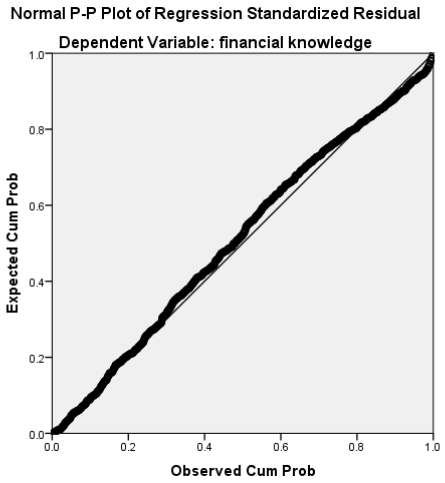


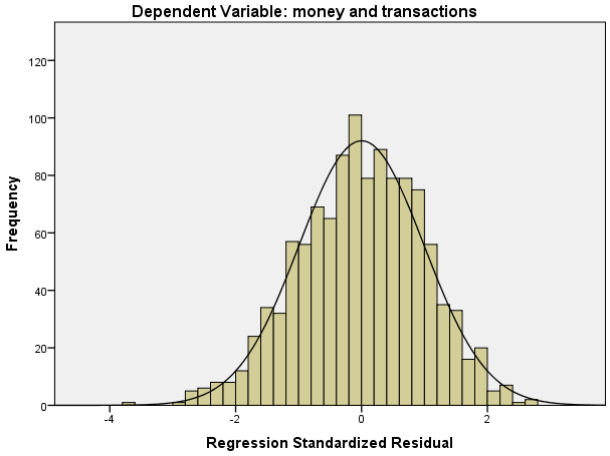


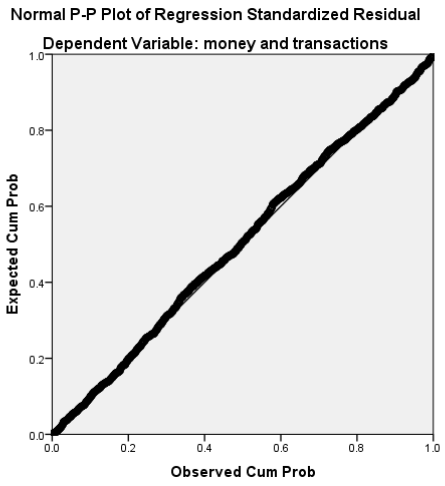

Scatterplot
Dependent Variable: financial risk and rewards
Regression Standardized Residual
Regression Standardized Predicted Value
3
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2

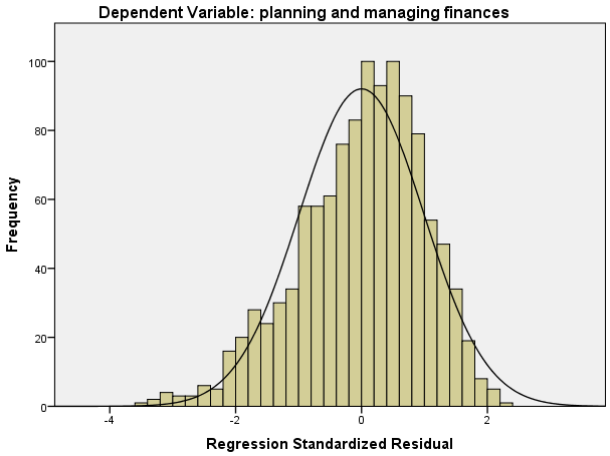
Plots showing the distribution of standardised residuals

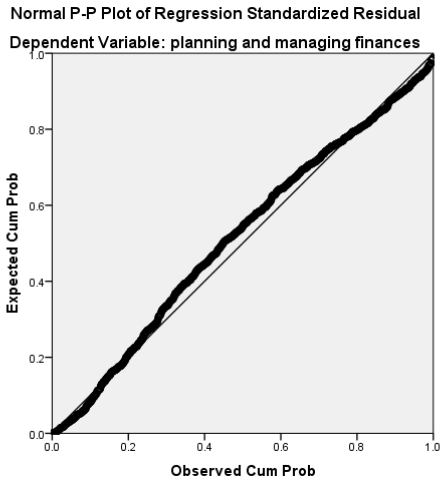


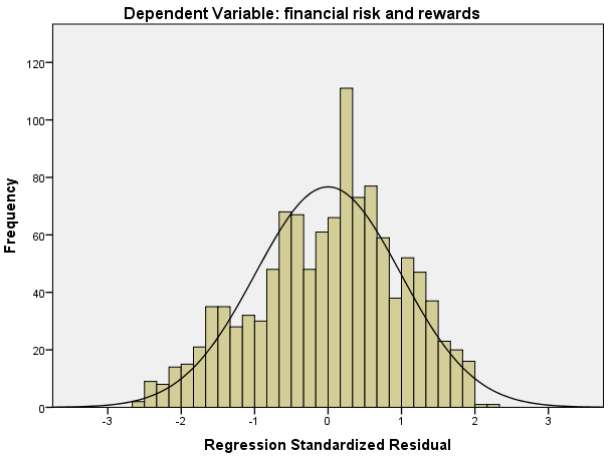


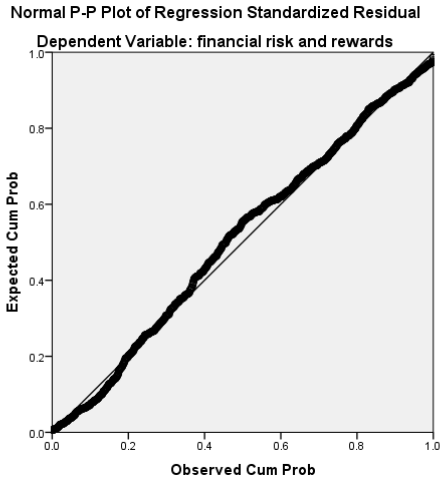



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: money and transactions
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Dependent Variable: planning and managing finances
Frequency
Regression Standardized Residual
0
20
40
60
80
100
-4
-2
0
2

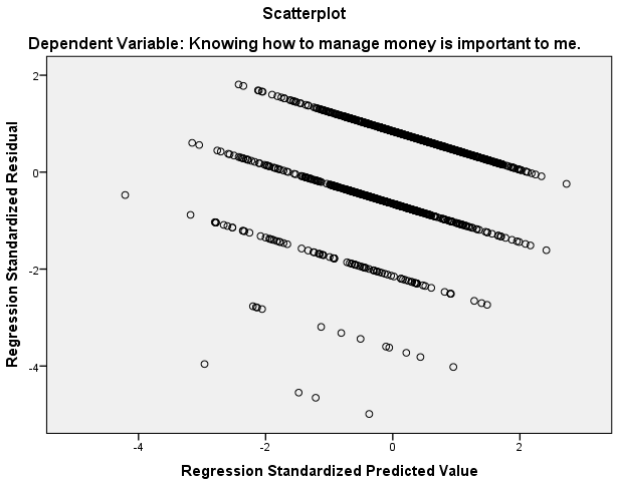

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: planning and managing finances
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

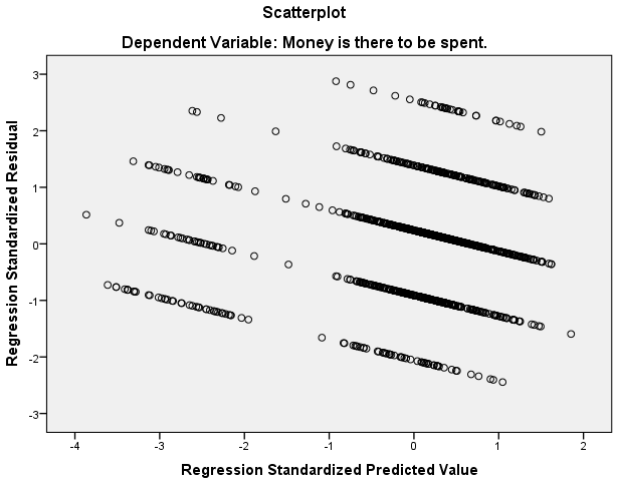

Dependent Variable: financial risk and rewards
Frequency
Regression Standardized Residual

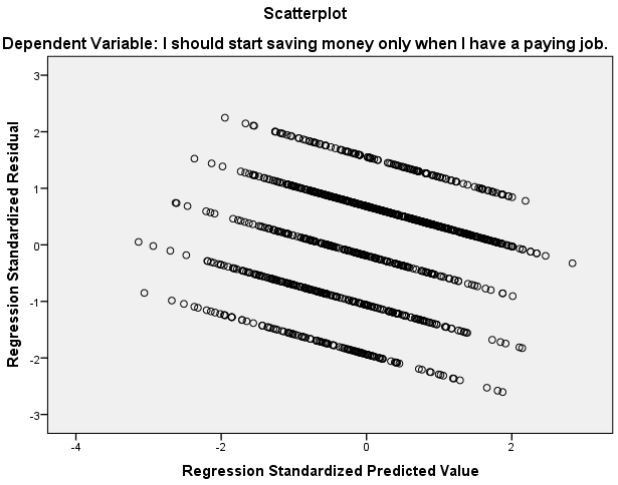

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: financial risk and rewards
Expected Cum Prob
Observed Cum Prob

Appendix Q Assumptions of multiple linear regressions (financial attitudes)

Evidence of homoscedasticity

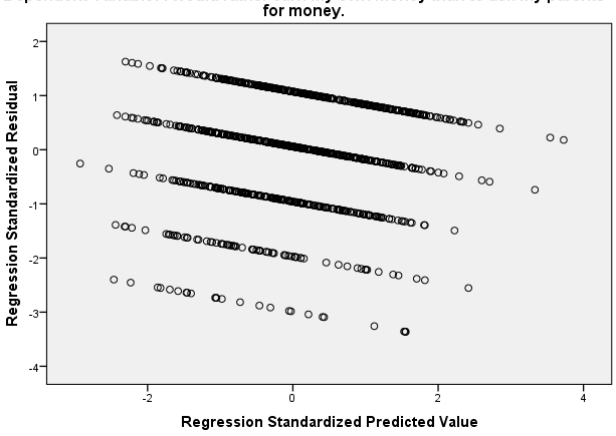






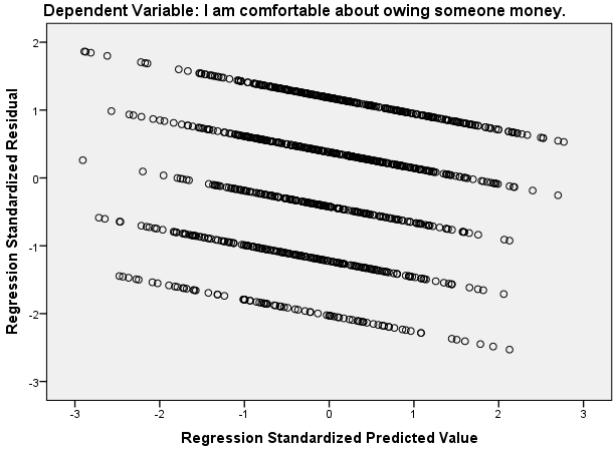
Scatterplot

Dependent Variable: I would rather earn my own money than to ask my parents for money.



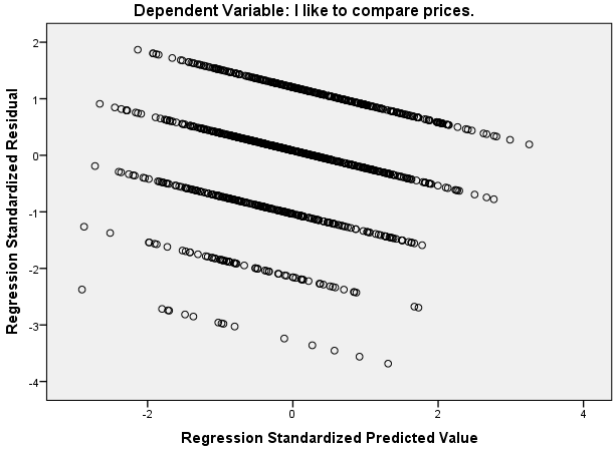
Scatterplot

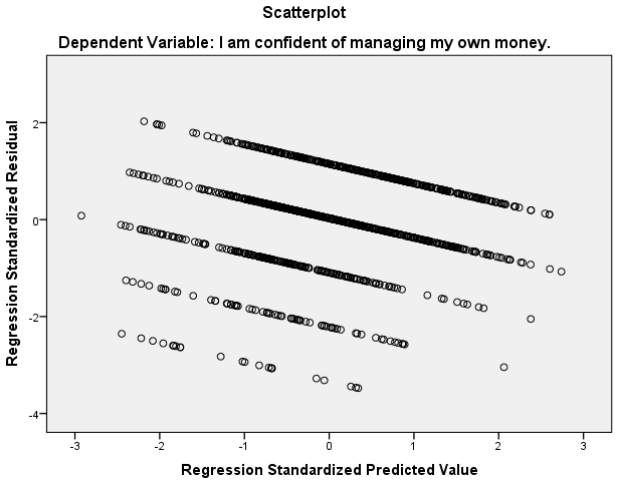
Dependent Variable: I am comfortable about owing someone money.



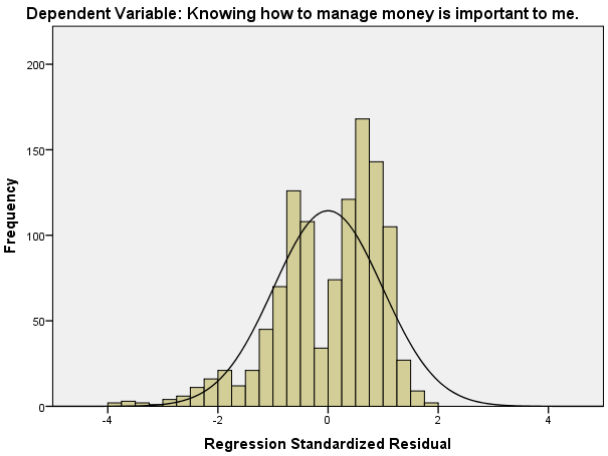
Scatterplot

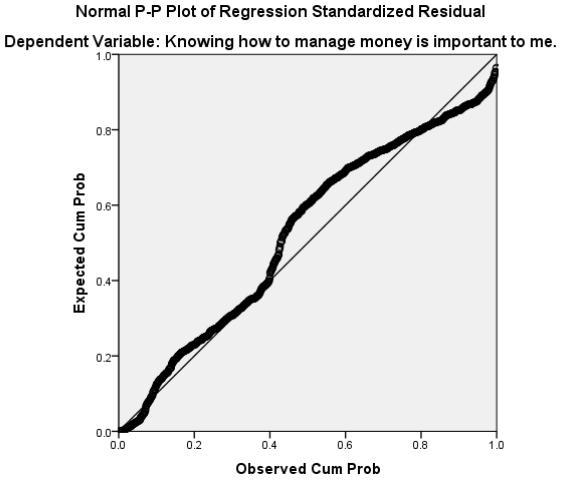
Dependent Variable: I like to compare prices.

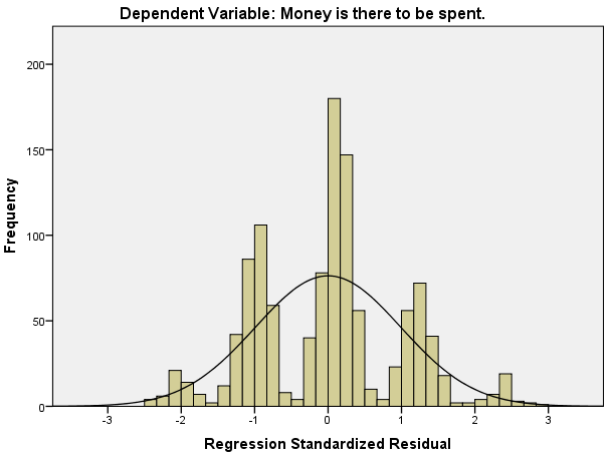



Scatterplot
Dependent Variable: I am confident of managing my own money.
Regression Standardized Residual
Regression Standardized Predicted Value
2
0
-2
-4
-3
-2
-1
0
1
2
3

Plots showing the distribution of standardised residuals

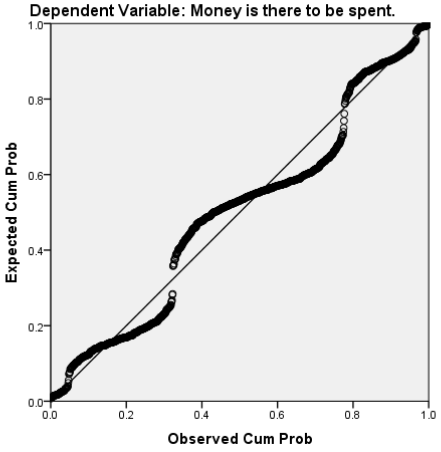




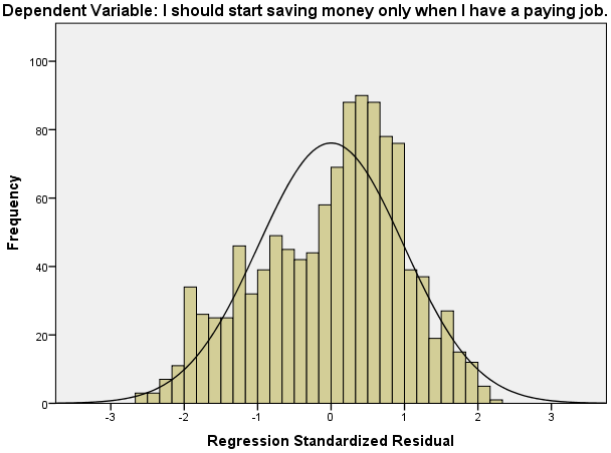


Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Money is there to be spent.

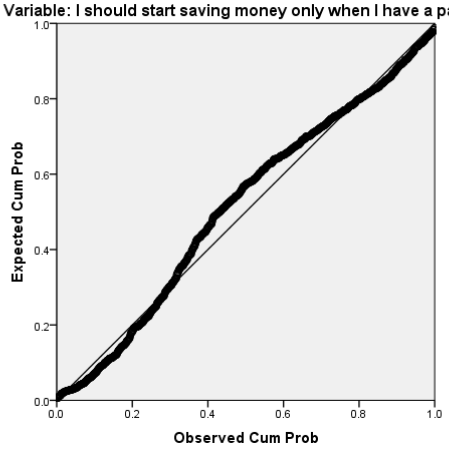


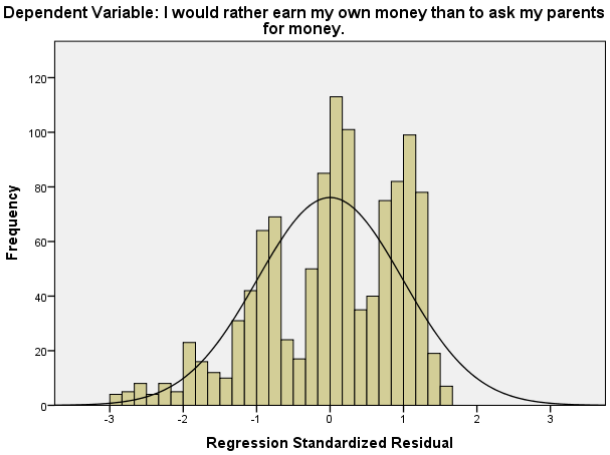
Dependent Variable: I should start saving money only when I have a paying job.

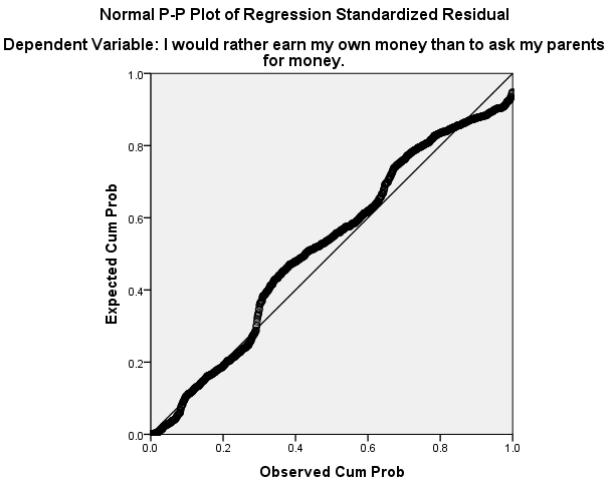


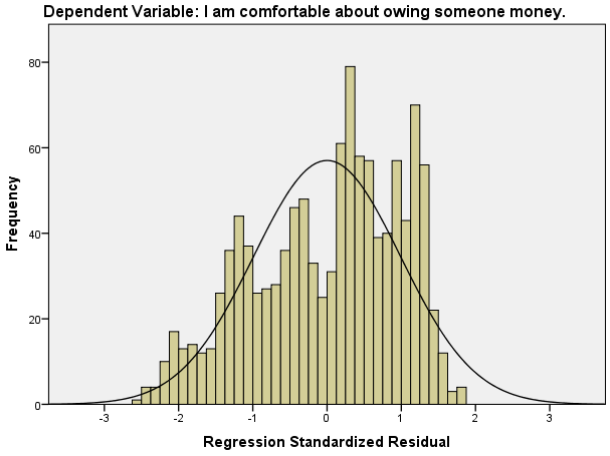
Normal P-P Plot of Regression Standardized Residual

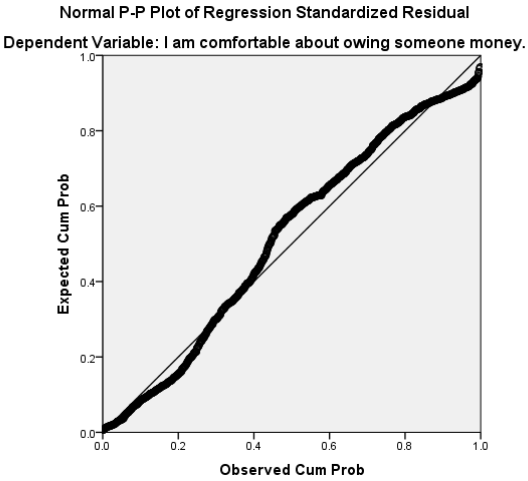
Dependent Variable: I should start saving money only when I have a paying job.

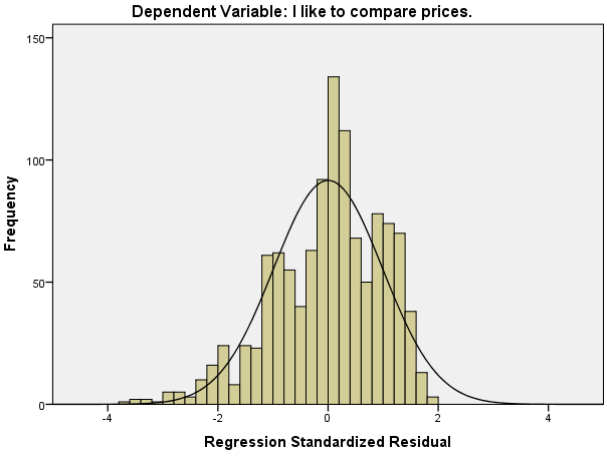


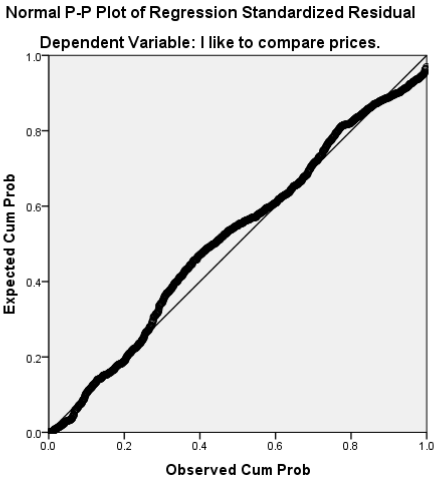

Dependent Variable: I would rather earn my own money than to ask my parents for money.
Frequency
Regression Standardized Residual

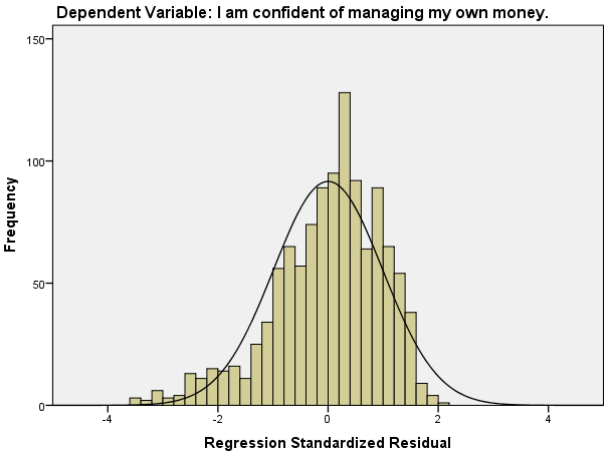

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I would rather earn my own money than to ask my parents for money.
Expected Cum Prob
Observed Cum Prob

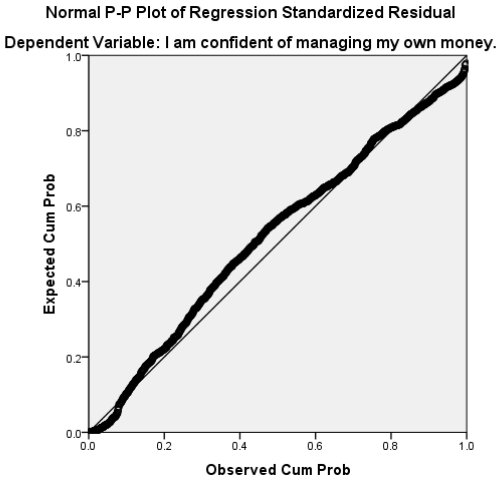

Dependent Variable: I am comfortable about owing someone money.
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I am comfortable about owing someone money.
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Dependent Variable: I like to compare prices.
Frequency
Regression Standardized Residual
0
50
100
150
-4
-2
0
2
4


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I like to compare prices.
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Dependent Variable: I am confident of managing my own money.
Frequency
150
100
50
0
-4
-2
0
2
4
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: I am confident of managing my own money.
Expected Cum Prob
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob

Appendix R Means of financial knowledge and skills (whole sample)

Table 61 Mean percentage scores for financial knowledge and skills by independent variables

	n	Financial knowledge and skills (%)	SD
Gender			
Male	945	57.68	20.62
Females	1853	56.22	19.65
Ethnicity			
White	1273	57.66	20.52
Mixed	259	54.51	21.51
Asian	712	57.51	19.27
Black	511	54.25	19.81
Other	137	52.26	19.20
Financial Behaviour Type			
Saver	806	57.40	20.39
Spender	309	50.76	19.94
Mixed Saver/Spender	1748	56.30	19.94
Entrepreneur	203	57.30	21.90
Business Studies Student			
No	2162	55.59	20.25
Yes	909	57.36	20.17
English level			
Level 1 to 4	97	41.32	20.21
Level 5	330	47.59	18.28
Level 6	739	56.90	18.58
Level 7	583	65.05	18.31
Level 8	204	68.29	18.52
Maths Level			
Level 1 to 4	144	39.17	16.58
Level 5	289	45.52	16.31
Level 6	635	54.43	17.56
Level 7	575	65.45	17.77
Level 8	333	72.59	17.49
Receives free school meals			
No	2488	57.34	20.09
Yes	358	50.49	19.24
Number of books			
0 to 20	414	49.10	19.19
21 to 50	616	54.12	19.19
51 to 100	674	57.56	19.54
more than 100	981	61.37	19.96
Highest education level of one parent			
Lower than A levels	468	54.07	20.19
A Levels	438	57.86	19.79
University education	1276	58.69	20.26

Table 62 Mean percentage scores of "Money and Transactions" by independent variables (full sample)

	n	Money and Transactions (%)	SD
Gender			
Male	945	57.86	22.51
Females	1853	55.74	22.06
Ethnicity			
White	1273	56.94	22.21
Mixed	259	54.58	24.48
Asian	712	57.38	21.68
Black	511	54.69	23.13
Other	137	54.01	21.08
Financial Behaviour Type			
Saver	806	57.41	22.57
Spender	309	51.22	22.30
Mixed Saver/Spender	1748	55.84	22.22
Entrepreneur	203	58.08	24.05
Business Studies Student			
No	2162	55.68	22.39
Yes	909	56.78	22.68
English level			
Level 1 to 4	97	41.23	22.32
Level 5	330	47.36	20.42
Level 6	739	56.74	21.36
Level 7	583	65.04	20.78
Level 8	204	68.09	19.92
Maths Level			
Level 1 to 4	144	38.26	18.59
Level 5	289	43.41	18.36
Level 6	635	54.60	20.26
Level 7	575	65.41	19.59
Level 8	333	74.01	18.55
Receives free school meals			
No	2488	57.11	22.37
Yes	358	50.71	22.02
Number of books			
0 to 20	414	49.12	21.91
21 to 50	616	54.14	21.99
51 to 100	674	56.97	22.19
more than 100	981	61.38	21.97
Highest education level of one parent			
Lower than A levels	468	53.59	22.36
A Levels	438	58.26	22.45
University education	1276	59.06	22.29

Table 63 Mean percentage scores of PMF by independent variables (full sample)

	n	Planning and managing finances (%)	SD
Gender			
Male	945	59.05	25.46
Females	1853	57.72	24.28
Ethnicity			
White	1273	59.39	25.25
Mixed	259	56.56	25.69
Asian	712	58.64	24.11
Black	511	55.34	23.74
Other	137	51.90	24.84
Financial Behaviour Type			
Saver	806	58.70	24.84
Spender	309	51.17	24.17
Mixed Saver/Spender	1748	57.90	24.78
Entrepreneur	203	58.18	25.80
Business Studies Student			
No	2162	56.72	25.02
Yes	909	59.12	24.49
English level			
Level 1 to 4	97	41.44	23.89
Level 5	330	47.73	23.13
Level 6	739	58.17	23.44
Level 7	583	66.90	23.14
Level 8	204	70.39	22.17
Maths Level			
Level 1 to 4	144	39.51	21.03
Level 5	289	46.23	21.73
Level 6	635	55.61	22.59
Level 7	575	67.50	22.85
Level 8	333	73.88	21.73
Receives free school meals			
No	2488	58.78	24.77
Yes	358	51.15	23.62
Number of books			
0 to 20	414	49.69	23.46
21 to 50	616	54.61	24.16
51 to 100	674	59.14	24.31
more than 100	981	63.37	24.28
Highest education level of one parent			
Lower than A levels	468	55.50	24.94
A Levels	438	59.04	24.38
University education	1276	59.92	25.00

Table 64 Mean percentage scores of FRR by independent variables (full sample)

	n	Financial risk and reward (%)	SD
Gender			
Male	945	53.73	30.36
Females	1853	53.76	29.17
Ethnicity			
White	1273	55.30	29.36
Mixed	259	49.23	30.81
Asian	712	55.02	29.38
Black	511	50.29	29.91
Other	137	48.36	27.98
Financial Behaviour Type			
Saver	806	54.16	29.48
Spender	309	48.46	29.12
Mixed Saver/Spender	1748	53.56	29.58
Entrepreneur	203	52.96	31.42
Business Studies Student			
No	2162	52.54	29.77
Yes	909	54.59	29.71
English level			
Level 1 to 4	97	41.23	30.63
Level 5	330	47.88	28.77
Level 6	739	54.19	29.18
Level 7	583	60.46	27.22
Level 8	204	63.60	29.29
Maths Level			
Level 1 to 4	144	40.80	28.93
Level 5	289	49.57	29.42
Level 6	635	50.98	28.54
Level 7	575	60.48	28.00
Level 8	333	65.47	28.60
Receives free school meals			
No	2488	54.36	29.62
Yes	358	48.25	29.21
Number of books			
0 to 20	414	47.58	29.32
21 to 50	616	52.84	29.63
51 to 100	674	55.23	28.97
more than 100	981	56.37	29.37
Highest education level of one parent			
Lower than A levels	468	51.81	28.70
A Levels	438	53.82	29.07
University education	1276	54.58	30.07

Appendix S Means of financial attitudes (whole sample)

Table 65 Mean scores of attitude statement "Knowing how to manage money is important to me" by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	933	4.48	.67
Females	1843	4.31	.74
Ethnicity			
White	1265	4.25	.75
Mixed	258	4.34	.76
Asian	706	4.51	.66
Black	502	4.47	.69
Other	137	4.50	.73
Financial Behaviour Type			
Saver	800	4.57	.63
Spender	302	3.91	.96
Mixed Saver/Spender	1739	4.31	.70
Aspirer	200	4.65	.76
Business Studies Student			
No	2143	4.31	.76
Yes	903	4.46	.68
English level			
Level 1 to 4	95	4.27	.82
Level 5	327	4.31	.79
Level 6	733	4.41	.75
Level 7	581	4.46	.70
Level 8	202	4.39	.80
Maths Level			
Level 1 to 4	143	4.09	.88
Level 5	288	4.36	.76
Level 6	628	4.40	.74
Level 7	573	4.45	.68
Level 8	332	4.49	.76
Receives free school meals			
No	2465	4.37	.73
Yes	356	4.36	.77
Number of books			
0 to 20	411	4.25	.79
21 to 50	613	4.34	.73
51 to 100	668	4.42	.64
more than 100	975	4.37	.77
Highest education level of one parent			
Lower than A levels	465	4.31	.80
A Levels	434	4.34	.73
University education	1267	4.42	.70

Table 66 Mean scores of attitude statement “Money is there to be spent”by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	931	2.65	.92
Females	1837	2.80	.88
Ethnicity			
White	1261	2.77	.89
Mixed	255	2.71	.94
Asian	705	2.73	.91
Black	502	2.68	.93
Other	137	2.66	.84
Financial Behaviour Type			
Saver	794	3.01	.89
Spender	302	1.98	.92
Mixed Saver/Spender	1738	2.73	.82
Entrepreneur	199	2.76	1.06
Business Studies Student			
No	2134	2.73	.90
Yes	905	2.71	.94
English level			
Level 1 to 4	95	2.53	1.04
Level 5	326	2.69	.97
Level 6	733	2.75	.93
Level 7	581	2.77	.88
Level 8	203	2.70	.95
Maths Level			
Level 1 to 4	142	2.52	1.00
Level 5	287	2.71	.91
Level 6	628	2.70	.93
Level 7	573	2.78	.90
Level 8	333	2.82	.91
Receives free school meals			
No	2459	2.75	.90
Yes	355	2.67	.90
Number of books			
0 to 20	408	2.59	.91
21 to 50	612	2.75	.87
51 to 100	666	2.81	.87
more than 100	972	2.76	.92
Highest education level of one parent			
Lower than A levels	465	2.77	.94
A Levels	432	2.78	.89
University education	1263	2.74	.92

Table 67 Mean scores of attitude statement "I should start saving money only when I have a paying job" by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	933	3.14	1.23
Females	1839	3.16	1.17
Ethnicity			
White	1260	3.16	1.14
Mixed	258	3.31	1.19
Asian	707	3.06	1.20
Black	502	3.19	1.32
Other	136	2.94	1.22
Financial Behaviour Type			
Saver	796	3.47	1.20
Spender	303	2.65	1.22
Mixed Saver/Spender	1738	3.07	1.15
Entrepreneur	199	3.19	1.28
Business Studies Student			
No	2137	3.12	1.20
Yes	905	3.16	1.22
English level			
Level 1 to 4	96	2.81	1.32
Level 5	325	2.95	1.25
Level 6	732	3.05	1.22
Level 7	580	3.29	1.19
Level 8	203	3.47	1.18
Maths Level			
Level 1 to 4	144	2.77	1.26
Level 5	285	2.85	1.21
Level 6	628	3.00	1.25
Level 7	573	3.30	1.21
Level 8	332	3.56	1.06
Receives free school meals			
No	2461	3.17	1.19
Yes	355	3.08	1.25
Number of books			
0 to 20	410	2.83	1.21
21 to 50	613	3.11	1.16
51 to 100	663	3.19	1.19
more than 100	975	3.36	1.18
Highest education level of one parent			
Lower than A levels	463	3.05	1.22
A Levels	432	3.22	1.16
University education	1267	3.23	1.20

Table 68 Mean scores of attitude statement "I would rather earn my own money than to ask my parents for money" by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	934	3.96	1.00
Females	1837	3.85	1.02
Ethnicity			
White	1259	3.84	1.01
Mixed	258	3.77	1.08
Asian	707	3.98	1.01
Black	502	3.87	1.05
Other	136	4.07	.99
Financial Behaviour Type			
Saver	797	4.07	.90
Spender	301	3.53	1.24
Mixed Saver/Spender	1737	3.82	1.00
Entrepreneur	199	4.00	1.23
Business Studies Student			
No	2140	3.86	1.04
Yes	901	3.91	1.01
English level			
Level 1 to 4	94	3.83	1.15
Level 5	325	3.90	1.03
Level 6	733	3.90	1.02
Level 7	581	3.89	1.01
Level 8	202	3.99	1.07
Maths Level			
Level 1 to 4	143	3.94	1.03
Level 5	288	3.91	1.02
Level 6	627	3.88	1.04
Level 7	571	3.95	1.02
Level 8	332	3.89	1.00
Receives free school meals			
No	2459	3.89	1.02
Yes	357	3.83	1.07
Number of books			
0 to 20	408	3.82	1.11
21 to 50	612	3.91	.98
51 to 100	665	3.88	.98
more than 100	974	3.91	1.05
Highest education level of one parent			
Lower than A levels	464	3.91	1.04
A Levels	432	3.91	1.00
University education	1267	3.87	1.05

Table 69 Mean scores of the attitude statement "I am comfortable about owing someone money"by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	933	3.34	1.27
Females	1836	3.57	1.22
Ethnicity			
White	1262	3.42	1.20
Mixed	258	3.50	1.26
Asian	703	3.37	1.30
Black	500	3.71	1.28
Other	136	3.59	1.24
Financial Behaviour Type			
Saver	795	3.47	1.27
Spender	302	3.33	1.34
Mixed Saver/Spender	1734	3.49	1.21
Entrepreneur	200	3.45	1.44
Business Studies Student			
No	2137	3.48	1.24
Yes	899	3.44	1.29
English level			
Level 1 to 4	93	3.10	1.49
Level 5	326	3.40	1.30
Level 6	733	3.38	1.27
Level 7	579	3.57	1.22
Level 8	203	3.73	1.23
Maths Level			
Level 1 to 4	144	3.19	1.44
Level 5	285	3.42	1.29
Level 6	627	3.39	1.28
Level 7	572	3.51	1.25
Level 8	332	3.71	1.19
Receives free school meals			
No			
Yes			
Number of books			
0 to 20	407	3.43	1.23
21 to 50	612	3.38	1.24
51 to 100	663	3.51	1.25
more than 100	976	3.52	1.27
Highest education level of one parent			
Lower than A levels	464	3.44	1.28
A Levels	433	3.57	1.23
University education	1264	3.50	1.25

Table 70 Mean scores of the attitude statement "I like to compare prices" by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	934	3.84	.98
Females	1837	3.78	.97
Ethnicity			
White	1264	3.69	.96
Mixed	258	3.72	1.03
Asian	705	3.85	.94
Black	499	4.02	.98
Other	136	3.82	.98
Financial Behaviour Type			
Saver	795	3.95	.94
Spender	303	3.46	1.16
Mixed Saver/Spender	1735	3.75	.95
Entrepreneur	200	3.98	1.03
Business Studies Student			
No	2137	3.73	1.00
Yes	903	3.93	.94
English level			
Level 1 to 4	96	3.52	1.16
Level 5	326	3.73	1.03
Level 6	732	3.86	.96
Level 7	580	3.99	.87
Level 8	203	3.94	.93
Maths Level			
Level 1 to 4	143	3.49	1.11
Level 5	286	3.77	.97
Level 6	630	3.84	.94
Level 7	571	3.94	.92
Level 8	333	4.06	.88
Receives free school meals			
No	2462	3.80	.97
Yes	354	3.76	1.06
Number of books			
0 to 20	410	3.53	1.11
21 to 50	611	3.74	.96
51 to 100	665	3.87	.91
more than 100	975	3.93	.95
Highest education level of one parent			
Lower than A levels	464	3.75	1.02
A Levels	433	3.82	.93
University education	1267	3.88	.97

Table 71 Mean scores of the attitude statement "I am confident of managing my own money"by independent variables (whole sample)

	n	mean scores (min=1, max=5)	SD
Gender			
Male	935	4.19	.84
Females	1839	3.80	.92
Ethnicity			
White	1264	3.84	.93
Mixed	258	4.08	.92
Asian	705	3.99	.83
Black	503	4.01	.93
Other	135	4.01	.96
Financial Behaviour Type			
Saver	798	4.16	.80
Spender	302	3.60	1.19
Mixed Saver/Spender	1738	3.86	.87
Entrepreneur	199	4.32	.93
Business Studies Student			
No	2140	3.88	.93
Yes	902	4.07	.86
English level			
Level 1 to 4	96	4.04	.93
Level 5	326	3.98	.87
Level 6	735	3.99	.96
Level 7	580	3.96	.91
Level 8	203	3.86	1.02
Maths Level			
Level 1 to 4	143	3.80	1.05
Level 5	288	3.96	.92
Level 6	630	3.99	.91
Level 7	572	3.98	.93
Level 8	333	3.99	.93
Receives free school meals			
No	2462	3.93	.91
Yes	356	3.95	.93
Number of books			
0 to 20	410	3.89	.91
21 to 50	612	3.91	.90
51 to 100	665	3.99	.86
more than 100	976	3.93	.96
Highest education level of one parent			
Lower than A levels	464	3.90	.95
A Levels	434	3.91	.92
University education	1267	3.98	.92

Table 72 Mean scores proactive attitudes by independent variables (whole sample)

	n	mean scores (min=1, max=20)	SD
Gender			
Male	928	15.74	2.26
Females	1826	16.49	2.17
Ethnicity			
White	1256	15.62	2.29
Mixed	258	15.9	2.47
Asian	700	16.34	2.06
Black	495	16.37	2.23
Other	134	16.39	2.30
Financial Behaviour Type			
Saver	792	16.74	2.00
Spender	296	14.49	2.87
Mixed Saver/Spender	1728	15.74	2.08
Entrepreneur	198	16.94	2.77
Business Studies Student			
No	2127	15.79	2.33
Yes	896	16.37	2.17
English level			
Level 1 to 4	93	15.70	2.61
Level 5	324	15.95	2.31
Level 6	729	16.15	2.34
Level 7	580	16.31	2.16
Level 8	201	16.18	2.52
Maths Level			
Level 1 to 4	141	15.36	2.49
Level 5	286	16.00	2.31
Level 6	625	16.12	2.21
Level 7	570	16.31	2.24
Level 8	331	16.44	2.38
Receives free school meals			
No	2448	15.98	2.26
Yes	351	15.90	2.43
Number of books			
0 to 20	407	15.48	2.59
21 to 50	609	15.90	2.22
51 to 100	662	16.16	2.09
more than 100			
Highest education level of one parent			
Lower than A levels	462	15.86	2.49
A Levels	431	15.97	2.20
University education	1260	16.15	2.24

Table 73 Mean scores reactive attitudes by independent variables (whole sample)

	n	mean scores (min=1, max=15)	SD
Gender			
Male	927	9.13	2.23
Females	1823	9.53	2.16
Ethnicity			
White	1253	9.36	2.16
Mixed	255	9.51	2.27
Asian	700	9.15	2.18
Black	496	9.59	2.41
Other	135	9.21	2.09
Financial Behaviour Type			
Saver	786	9.94	2.21
Spender	298	7.95	2.14
Mixed Saver/Spender	1729	9.29	2.07
Entrepreneur	198	9.42	2.67
Business Studies Student			
No	2119	9.33	2.20
Yes	899	9.33	2.29
English level			
Level 1 to 4	92	8.38	2.73
Level 5	324	9.05	2.22
Level 6	728	9.19	2.21
Level 7	578	9.63	2.16
Level 8	203	9.90	2.29
Maths Level			
Level 1 to 4	142	8.49	2.40
Level 5	282	8.99	2.09
Level 6	623	9.08	2.19
Level 7	572	9.59	2.30
Level 8	331	10.09	2.12
Receives free school meals			
No	2444	9.39	2.17
Yes	352	9.21	2.24
Number of books			
0 to 20	404	8.83	2.09
21 to 50	611	9.24	2.10
51 to 100	658	9.52	2.14
more than 100	969	9.65	2.28
Highest education level of one parent			
Lower than A levels	462	9.26	2.25
A Levels	429	9.59	2.20
University education	1255	9.47	2.24

Appendix T Means of financial attitudes (partial sample)

Table 74 Mean attitude scores by independent sample (n=1142)

	n	Importance of personal finance	SD	Attitude towards spending	SD	Attitude towards saving	SD	Attitude towards financial independence	SD
Gender									
Male	377	4.58	.62	2.71	.97	3.26	1.23	4.06	.97
Females	765	4.36	.75	2.83	.89	3.20	1.19	3.89	1.01
Ethnicity									
White	508	4.29	.74	2.82	.89	3.22	1.16	3.89	.99
Mixed	98	4.49	.68	2.83	.87	3.45	1.12	3.88	.99
Asian	255	4.58	.65	2.79	.93	3.15	1.21	4.04	.99
Black	212	4.54	.71	2.75	1.01	3.25	1.30	3.92	1.03
Other	69	4.54	.66	2.68	.87	3.03	1.27	4.07	1.06
Financial Behaviour Type									
Saver	306	4.61	.62	3.04	.88	3.54	1.16	4.13	.86
Spender	106	3.96	.90	1.93	.88	2.67	1.27	3.62	1.24
Mixed Saver/Spender	646	4.39	.70	2.81	.86	3.13	1.18	3.87	.99
Entrepreneur	84	4.77	.50	2.85	.96	3.40	1.14	4.26	1.04
Business Studies student									
No	795	4.39	.73	2.82	.91	3.22	1.20	3.94	1.01
Yes	347	4.54	.65	2.72	.95	3.21	1.21	3.94	.99
English level									
Level 1 to 4	43	4.35	.72	2.70	1.01	2.70	1.28	3.83	1.12
Level 5	152	4.29	.87	2.76	1.02	3.10	1.25	4.00	.99
Level 6	429	4.41	.72	2.79	.94	3.04	1.21	3.92	1.01
Level 7	382	4.49	.66	2.80	.85	3.40	1.14	3.61	1.21
Level 8	136	4.54	.65	2.85	.90	3.56	1.13	4.09	.99
Maths Level									
Level 1 to 4	59	4.12	.87	2.54	1.04	2.63	1.33	4.14	1.02
Level 5	151	4.34	.82	2.75	.99	2.89	1.18	3.94	1.02
Level 6	353	4.41	.71	2.77	.89	3.06	1.25	3.91	1.01
Level 7	349	4.46	.66	2.82	.91	3.35	1.15	3.95	1.01
Level 8	230	4.58	.64	2.87	.89	3.63	1.04	3.94	.97
Receives free school meals									
No	1020	4.43	.72	2.79	.92	3.23	1.21	3.93	1.01
Yes	122	4.45	.68	2.82	.94	3.11	1.19	4.02	.94
Number of books									
0 to 20	137	4.38	.71	2.68	.96	2.94	1.25	3.87	1.13
21 to 50	234	4.35	.83	2.77	.92	3.09	1.19	3.90	1.00
51 to 100	291	4.49	.62	2.85	.92	3.15	1.23	3.89	1.00
more than 100	480	4.46	.71	2.80	.91	3.40	1.16	4.01	.97
Highest parents' education									
Lower than A levels	220	4.39	.71	2.88	.93	3.07	1.22	4.04	.99
A Levels	234	4.42	.76	2.87	.90	3.30	1.17	3.89	.96
University education	688	4.46	.70	2.74	.92	3.24	1.21	3.93	1.02

Table 75 Mean attitude scores by independent sample (n=1142)

	n	Attitude towards debt	SD	Attitude towards price comparison	SD	Confidence in managing money	SD
Gender							
Male	377	3.42	1.33	4.01	.94	4.29	.84
Females	765	3.58	1.23	3.88	.92	3.82	.97
Ethnicity							
White	508	3.48	1.21	3.79	.94	3.83	1.04
Mixed	98	3.40	1.28	3.77	.96	4.19	.83
Asian	255	3.36	1.35	4.00	.86	4.09	.80
Black	212	3.86	1.24	4.21	.86	4.05	.93
Other	69	3.69	1.27	4.00	1.03	4.04	.92
Financial Behaviour Type							
Saver	306	3.60	1.27	4.06	.90	4.24	.80
Spender	106	3.32	1.35	3.62	1.10	3.41	1.22
Mixed Saver/Spender	646	3.51	1.23	3.86	.90	3.87	.92
Entrepreneur	84	3.61	1.40	4.31	.82	4.51	.74
Business Studies student							
No	795	3.53	1.25	3.89	.93	3.92	.97
Yes	347	3.51	1.30	4.01	.90	4.09	.90
English level							
Level 1 to 4	43	3.10	1.51	3.58	1.07	4.05	.84
Level 5	152	3.54	1.29	3.84	1.02	4.06	.92
Level 6	429	3.40	1.28	3.88	.93	4.00	.97
Level 7	382	3.61	1.21	4.01	.88	3.92	.93
Level 8	136	3.81	1.21	4.04	.87	3.92	1.01
Maths Level							
Level 1 to 4	59	3.05	1.53	3.61	1.15	3.85	1.03
Level 5	151	3.55	1.32	3.79	.94	3.95	.98
Level 6	353	3.41	1.25	3.85	.94	3.98	.95
Level 7	349	3.60	1.23	3.97	.89	3.94	.94
Level 8	230	3.71	1.19	4.13	.85	4.07	.93
Receives free school meals							
No	1020	3.53	1.26	3.93	.92	3.96	.96
Yes	122	3.48	1.33	3.89	.98	4.11	.89
Number of books							
0 to 20	137	3.52	1.27	3.79	1.06	4.01	.96
21 to 50	234	3.34	1.30	3.89	.89	3.94	.94
51 to 100	291	3.57	1.26	3.93	.88	4.02	.92
more than 100	480	3.60	1.25	3.98	.93	3.95	.98
Highest parents' education							
Lower than A levels	220	3.52	1.33	3.98	.89	3.97	.99
A Levels	234	3.56	1.27	3.83	.93	3.94	.91
University education	688	3.52	1.25	3.94	.94	3.99	.95

Table 76 Mean attitude scores by independent sample (n=1142)

	n	Proactive attitudes (min 1, max 25)	SD	Reactive attitudes (min 1, max 15)	SD
Gender					
Male	377	16.95	2.09	9.40	2.27
Females	765	15.96	2.31	9.62	2.16
Ethnicity					
White	508	15.82	2.44	9.53	2.20
Mixed	98	16.33	2.08	9.67	2.26
Asian	255	16.72	1.94	9.30	2.04
Black	212	16.74	2.11	9.87	2.35
Other	69	16.65	2.51	9.43	2.10
Financial Behaviour Type					
Saver	306	17.04	2.04	10.19	2.08
Spender	106	14.61	2.81	7.79	2.12
Mixed Saver/Spender	646	15.99	2.10	9.46	2.11
Entrepreneur	84	17.86	1.84	9.87	2.35
Business Studies student					
No	795	16.14	2.30	9.59	2.20
Yes	347	16.60	2.23	9.45	2.20
English level					
Level 1 to 4	43	15.88	2.63	8.43	2.58
Level 5	152	16.19	2.51	9.41	2.25
Level 6	429	16.22	2.26	9.26	2.16
Level 7	382	16.33	2.22	9.81	2.10
Level 8	136	16.59	2.19	10.22	2.14
Maths Level					
Level 1 to 4	59	15.76	2.78	8.22	2.46
Level 5	151	16.02	2.43	9.23	2.08
Level 6	353	16.15	2.24	9.25	2.11
Level 7	349	16.32	2.15	9.77	2.21
Level 8	230	16.74	2.28	10.21	2.07
Receives free school meals					
No	1020	16.26	2.31	9.56	2.18
Yes	122	16.48	2.13	9.41	2.32
Number of books					
0 to 20	137	16.05	2.46	9.15	2.25
21 to 50	234	16.09	2.39	9.20	2.16
51 to 100	291	16.34	2.27	9.58	2.16
more than 100	480	16.41	2.19	9.81	2.19
Highest parents' education					
Lower than A levels	220	16.38	2.35	9.47	2.23
A Levels	234	16.08	2.22	9.75	2.18
University education	688	16.32	2.29	9.50	2.19