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## Estimating individual total costs of domestic violence

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# Estimating individual total costs of domestic violence

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## Abstract

This paper estimates total individual costs of domestic violence. It draws on a cross-section survey that includes data on self-reported victimization variables, individual income and a self-reported life satisfaction variable. Using a life satisfaction approach, it estimates the variation in income needed to compensate for the presence of domestic violence, approximating the shadow price of domestic violence. It accounts for socio-demographic characteristics, relative bargaining power, local crime rates and personality. Results show that the valuation respondents place on violence depends both on income and on whether they are men and women. Men's valuation tends to be more significant for low income levels and for low vulnerability levels. Women's valuation and marginal utility of income does not seem to depend significantly on violence. As such, women's average valuation is estimated to be approximately £12500 and men's goes from roughly £1000 up to £25000.

*We do not believe that domestic violence is “simply cultural”. We believe it is simply criminal.*  
Hillary Clinton

# 1 Introduction

In 1996, the World Health Assembly declared violence a major public health issue. Six years later, the World Health Organization issued the first report on Violence and Health, which describes incidence rates, possible causes and consequences and political agenda on prevention of different types of violence. Domestic Violence has very high incidence rates in Latin American countries, but evidence suggests that this type of violence crosscuts all country development stages and income groups within a country (e.g. Morrison and Biehl (1999) and Krug, Dahlberg, Mercy, Zwi, and Lozano (2002)).

Recent years have seen an increased interest in the economic consequences of domestic violence and on its social or private costs. Bowlus and Seitz (2006) show that abused women are more likely to divorce and less likely to be employed. With a dynamic model, they also suggest that once violence has taken place, increasing women’s employment may in fact worsen violence. Morrison and Biehl (1999), in turn, show how children that have been exposed to domestic violence tend to underperform at school, making the economic effects of domestic violence intergenerational and thus long lasting. Pollak (2002) went one step further and modelled the propensity of tolerating and perpetrating violence as a function of previous exposure to violence. He concluded that violence does tend to stay in families previously exposed to it. On the other hand, the estimation of the costs of violence has mostly focussed on social costs as measured by public expenditure on policing, prevention, prosecution, courts and imprisonment charges, and by foregone productivity of the perpetrators and allocation of resources to unproductive or wasteful activities. Private costs have also been measured mainly as expenditure on combatting crime, e.g. fences and alarm setups, and as direct costs measured by a reduction in productivity of the victim and by property damage (see e.g. Becker (1993) and Buvinic and Morrison (2002)). It still remains as a difficult task to assess the private total costs of domestic violence, not only due to the lack of data in most surveys, but also due to its psychological nature and indirect repercussions in many other domains of life (see e.g. Nussbaum (2000) for a discussion of how essential a violence-free life is for human development).

The most obvious candidate to assess the total private value of an asset with such intangible impacts would be a cost-benefit analysis. Revealed preference methods have been used, for instance, in Rao, Gupta, Lokshin, and Jana (2003) to estimate the cost of safe sex. They use a natural experiment by which some prostitutes in the Calcutta red light district choose to have their clients wearing condoms, knowing that the clients will pay them less for this less satisfying service. As such, the cost of safe sex is estimated as the average difference in the price received by prostitutes who choose not to have safe sex and those who choose to. In the case of domestic violence, finding suitable natural experiments is not easy. Most data on domestic violence comes from very self-selected samples of women that have sought help or that have been reported by third parties. Moreover, and because domestic violence can hardly be conceived as a market good, or because its interaction with markets is so complex,

finding suitable alternative revealed preference settings may be a red herring. Stated preference methods have been applied to assess the value of different types of crime. Atkinson, Healey, and Mourato (2005) has estimated that different types of crime can cost each victim up to £36000 in the UK. However, direct questions on hypothetical scenarios of violence may deliver very biased responses because of the emotional and cognitive exercise that imagining such situations would entail.

As such, this paper follows a life satisfaction approach, whereby the tradeoff ratio between domestic violence and income is calculated from a utility regression equation. Other applications of this procedure include Carroll, Frijters, and Shields (2008) and van Praag and Baarsma (2001). Carroll, Frijters, and Shields (2008) use life satisfaction data and explore geographical differences together with variation in the timing of the interview to estimate the costs of droughts in Australia. van Praag and Baarsma (2001) estimate the costs of living close to the Amsterdam Schiphol airport. The main advantage of this procedure vis-à-vis a stated preference approach is the lack of incentive for strategic responses. The respondents are asked about their satisfaction with life as a whole after a comprehensive questionnaire on several dimensions has been carried out. They cannot anticipate how their responses to such life satisfaction questions will link to each and every other parameter of interest. As such, and as long as the impact of violence on well-being can be isolated, this paper identifies the true valuation respondents place on domestic violence.

Section 2 discusses some of the main economic models of domestic violence. Section 3 describes the data in detail, followed by a description of the methodology and results. Section ?? provides some refinements and robustness checks on the main methodology and section 7 concludes.

## 2 Theoretical Models of Domestic Violence

The occurrence of domestic violence casts doubt on the unitary model of intrahousehold decision making (see e.g. Chiappori, Haddad, Hoddinott, and Kanbur (1993) for such a discussion). Even though one can conceive an altruistic head for whom the utility derived from inflicting domestic violence is larger than the utility loss for the selfish spouse, modelling the occurrence of domestic violence solely on the grounds that it yields utility is not useful. Most of the initial modelling attempts of why domestic violence occurs have thus incorporated an instrumental reason for the occurrence of domestic violence, by which the perpetrator is able to control the victim's behaviour, and have resorted to bargaining models of intrahousehold decision-making. Tauchen, Witte, and Long (1991) assume that domestic violence has both an intrinsic, or expressive, and an instrumental value. They develop a Stackelberg game, whereby the potential victim moves first and knows that her behaviour will determine the level of violence that the perpetrator will inflict on her in the second stage. As long as the dominant partner's marginal utility of violence is higher when she behaves in a non-conformist way, then violence is a credible threat. This basically means that when the victim is at her reservation utility (which will happen for all low income families), domestic violence only serves an expressive purpose. Any increase in the victim's income will increase her utility and decrease violence, whereas an

increase in his income will have opposite effects. The dominant partner will transfer enough income to the victim to ensure she stays in the relationship even when violence increases. As the victim's income increases, the injurer's transfer decreases and so does violence. However, if both spouses gain from the relationship, the relationship between income and violence is not as straightforward. This is because the equilibrium transfers would change according to the change in relative incomes, and this could enhance or reduce violence depending on the parameters of the model. In particular, it will depend on how the injurer's marginal utility of violence changes with his and her consumption of market goods. This model cannot however explain why relationships may break down in the presence of domestic violence, let alone why women return to violent relationships. Aizer and Bó (2007) model the possibility of women returning to violent relationships by assuming time inconsistent preferences. With time inconsistent preferences, women will more likely resort to commitment mechanisms, such as no-drop policies, to ensure that they will not as likely return to violent relationships. However, even though this model is able to explain some empirical cyclical patterns of victims of domestic violence, it is not testable as it relies on assumptions on preferences. Aizer (2007) develops a cooperative model of domestic violence, and assuming homothetic preferences, finds that the higher the relative income of women, the less likely they will be victims of domestic violence. This is a variation of a model proposed in Farmer and Tiefenthaler (1997), where the men had all the bargaining power, but the same finding subsists. All in all, most of these models try to explain violence as a function of economic factors such as employment and individual income and overall find that the more favourable these distribution factors are to women, the less likely they will be victims of domestic violence. In empirical work, estimating a causal impact of income on violence has proven difficult, but this will however be discussed later. When the models attempt to relate violence to the preference for controlling behaviour (such as Tauchen, Witte, and Long (1991)) or for sustaining social norms (see Conrad and Sethi (2008)), the predictions are however less clear. However, these models are more suitable in explaining how violence has been evolving over time as a function of socio-demographic variables. This paper does provide some empirical insights on the impact of social norms and relative bargaining power on domestic violence.

### 3 Data

The main dataset this paper draws upon was developed and discussed in Anand, Hunter, Carter, Dowding, Guala, and Hees (2005). Originally, it was designed to defy the notion that capabilities cannot be measured and it contains 65 capability indicators that relate directly to Nussbaum's (2000)'s list of the capabilities that are essential for a flourishing human life. The survey instrument was delivered to a subsample of the YouGov database and administered online.

In particular, this dataset includes a question on whether the individual has ever been a victim of domestic violence and a question on how vulnerable they feel to future domestic violence. The actual wording is as follows.

1. Have you ever been a victim of domestic violence (yes=1/no=0) DV

2. Please indicate how vulnerable you feel to domestic violence (7 point scale: 7=completely vulnerable) VDV

We choose to use the vulnerability to domestic violence question as our measure of violence for several reasons. Firstly, this dataset does not include questions on how long the events took place or on how often they occur. Nor does it include information on the spouse of the respondent, or even on whether the respondent is still in a violent relationship. Hence the binary variable would not reflect the degree to which violence is a real threat and present in the respondent's life. Second, the shadow price of violence is best approximated with a continuous measure. The vulnerability to domestic violence question does have an underlying continuum of degrees of violence and makes our estimates of the shadow price more meaningful. Thirdly, and because of the limiting information about the degree of exposure to violence this binary measure entails, Anand and Santos (2007) show that the impact on utility of vulnerability to domestic violence is much more expressive than the impact of the experience of domestic violence per se. However, given the evidence that the willingness to pay for a violent-free environment can be substantially different from the willingness to accept it, the vulnerability question is interacted with the binary experienced violence variable (see e.g. Knetsch (2000) and Pearce, Atkinson, and Mourato (2006) for discussions on willingness to pay and willingness to accept.).

The dataset also contains a self-reported measure of life satisfaction. Specifically, it asks "How satisfied or dissatisfied are you with your life as a whole?". This question is asked both at the beginning and at the end of the survey. This paper uses the second measure on the grounds that it should be less vulnerable to idiosyncracies because it comes after the respondents had to reflect on several relevant areas of their lives. This will be our measure of utility. There is currently a vast literature on the economics of happiness that hinges on similar questions. Despite the philosophical considerations undermining this variable as a measure of utility, or of what really matters for well-being in an eudaemonic sense, findings seem to be robust and helpful in shaping economic policy at different levels (see e.g. Clark, Frijters, and Shields (2006), Ferrer-i-Carbonell and Frijters (2004) and Frey and Stutzer (2002) for accounts of the main empirical findings and contributions).

The income variable included in this dataset to measure the value of domestic violence is individual income. This is assuming that the individual only has control over their share of income, and not the other members'. It stems from the following question: "Gross personal income is an individual's total income received from all sources, including earnings, salaries, or rents and BEFORE tax and contributions to national insurance are deducted. What is your gross personal income?". Respondents had then to choose an income band presented either in terms of annual income or the weekly equivalent, e.g. "£1 to £9999 per year (£1 to £199 per week app)". Again, we would need a continuous measure of income for our exercise to be reliable. To tackle this problem, Layard, Mayraz, and Nickell (2007) uses the midpoint of each interval, then the second tercile of the lowest band and the first tercile of the highest, uncensored band. We will use this procedure but compare it with an imputation exercise we now describe. This dataset is from 2005 and it includes a rich set of socio-demographic variables, together with the respondents 3-digit home address postcode. The British Household Panel Survey includes similar variables, together with a self-reported satisfaction variable. We then estimate

an earnings equation with a rich set of regressors to predict the income each respondent from our main dataset would have, for each income band. We used BHPS data from 2000 until 2004, the closest available data. Out of approximately 1000 observations, only 20 individuals end up with a predicted income outside their reported income band<sup>1</sup>. For completeness, we then computed the mean value of each band and, not surprisingly given the negative skewness of the income distribution, these differ substantially from Layard, Mayraz, and Nickell's (2007)<sup>2</sup>. All three measures of income will be used in the estimation procedure. Figure 1 clearly shows how skewness is larger for the continuous measure and lowest for Layard's measure.

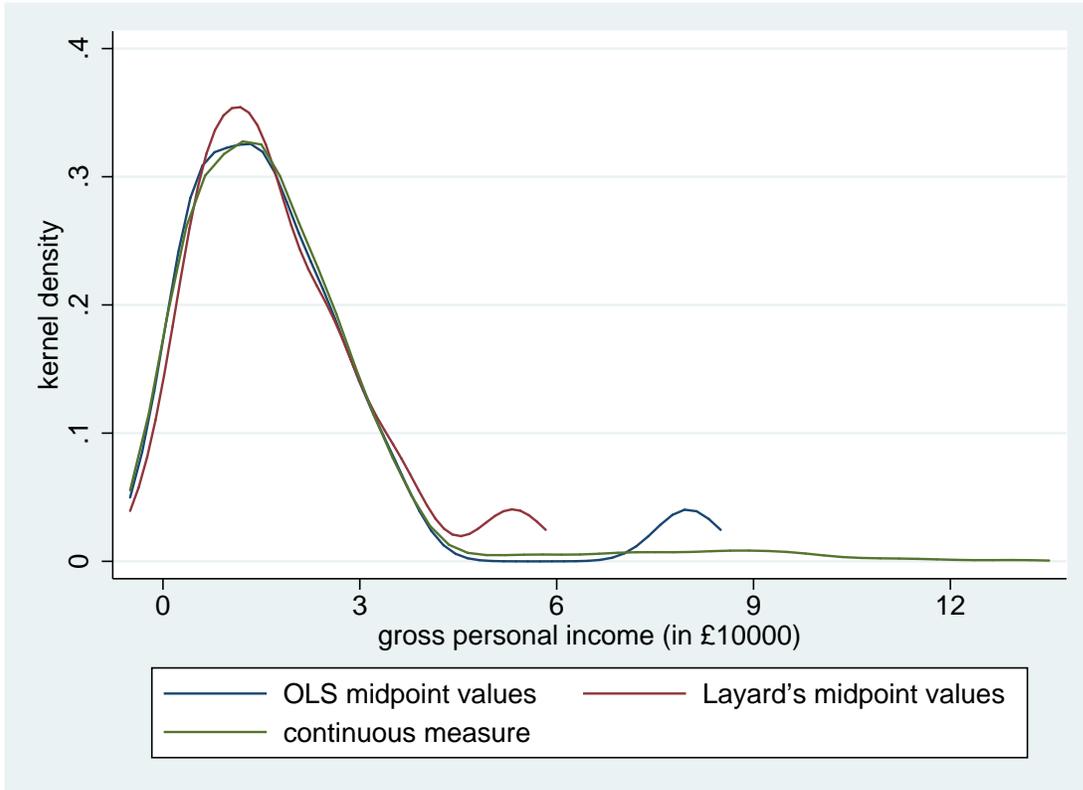


Figure 1: Income Distribution of the 3 measures of personal income used

Table 1 shows a crude description of the incidence of domestic violence impacts on the distribution of several socio-demographic and economic factors. We have used the binary measure for presentational issues<sup>3</sup>. It shows that individuals who have been victims of domestic

<sup>1</sup>The variables used were: UK fine regional data, gender, age, schooling, employment status, marital status, gross household income, number of dependents, ethnicity, religion, calendar year and life satisfaction.

<sup>2</sup>The second tercile of the first interval is £6666 whereas the mean value is £5513; similar, for the remaining intervals: £15000 vs. £14942; £25000 vs. £24268; £35000 vs. £33430; and finally £53333 vs. £80000.

<sup>3</sup>Results with the vulnerability measure available upon request.

violence are both less happy and earn a lower income. Similarly, they come disproportionately from non-White British background, they are not working, are separated and have dependents. Ethnicity, despite reflecting differences in labour market outcomes and wealth, can reflect differences in tolerance to and social acceptance of domestic violence. Marital status is important first because living with someone increases the costs of leaving such a relationship, and second because separated respondents may well have been in a violent relationship and need to be distinguished from singles. Distributions end up not being significantly different, even though the proportion of separated respondents that have been victims of domestic violence is substantially higher. Having dependents also increases the costs of leaving a relationship and this table shows that the incidence of domestic violence on respondents with dependents is larger than on those without dependents. This is in line with Agarwal (2006), which claims that the number of children deter women more from leaving a violent relationship. Incidence of domestic violence also tends to fall more heavily on poorer households, but the proportions of respondents affected by it are significant at all levels of income. Bargaining models would predict that having a strong outside option makes the household decision-making outcome more favourable. Indeed, these crude results do show that higher personal income and being employed decreases the likelihood of violence, even though we are not claiming causality. We have developed a measure of individual relative income to characterize bargaining power within the household. We have assumed that there were never more than 2 earners in the household, including the respondent (in the UK, these account for over 92% of all households, according to the 2005 Expenditure and Food Survey). As such, and using the interval data on both personal and household income, we were able to infer whether the respondent was earning relatively more or less than the other potential earner for most of the cases. An example is when the household income is said to be in the [ $\pounds 30000$ ,  $\pounds 40000$ [ bracket and individual income is said to be in the [ $\pounds 20000$ ,  $\pounds 30000$ [ bracket. The only way in which the spouse could be earning the same as the respondent is when the respondent earns  $\pounds 20000$ , the lowest value in the reported bracket, yielding a total of  $\pounds 40000$ , the highest possible value in the reported household income value. In this case, given that this has probability zero, we classified these cases as cases where the respondent has a relatively higher income. The situations where we could not draw any conclusion due to the width of the intervals, we classified the relative power as equal.

To isolate the impact of domestic violence on satisfaction, this paper further includes a measure of personality following Gosling, Rentfrow, and Jr. (2003). This is important to distinguish cultural factors from individual heterogeneity. Also, and because exposure to violence as a child also influences personality, these variables also aim to account for unobserved previous exposure to violence as a child. The dataset includes questions on several personality traits as follows:

1. I see myself as extraverted, enthusiastic (7 point scale: 1=agree strongly 7=disagree strongly)
2. I see myself as reserved, quiet (7 point scale: 1=agree strongly 7=disagree strongly)
3. I see myself as sympathetic, warm (7 point scale: 1=agree strongly 7=disagree strongly)

Table 1: Incidence of domestic violence across several socio-demographic and economic variables

	Victim of Domestic Violence		Total
	Yes	No	
Individual Personal Income <sup>a)</sup>			
No income	3.82	5.14	4.91
£1 up to £9,999 a year	39.49	27.54	29.59
£10,000 up to £19,999	34.39	31.23	31.77
£20,000 up to £29,999	15.29	20.55	19.65
£30,000 up to £39,999	5.10	9.75	8.95
£40,000 or more a year	1.91	5.80	5.13
N	157	759	916
<sup>a)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.001.			
Life Satisfaction <sup>b)</sup>			
Completely Satisfied	2.30	4.89	4.45
Very Satisfied	18.97	26.43	25.17
Fairly Satisfied	37.36	43.66	42.59
Neither Satisfied nor Dissatisfied	9.77	9.31	9.39
Fairly Dissatisfied	18.97	10.48	11.91
Very Dissatisfied	11.49	4.07	5.32
Completely Dissatisfied	1.15	1.16	1.16
N	174	859	1033
<sup>b)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.000.			
Ethnicity <sup>c)</sup>			
White British	86.47	91.12	90.33
Non-White British	13.53	8.88	9.67
N	170	833	1003
<sup>c)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.0619.			
Marital Status <sup>d)</sup>			
Married or co-habiting	59.77	67.17	65.92
Separated	18.97	6.52	8.62
Other living alone	21.26	26.31	25.46
N	174	859	1003
<sup>d)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.3433.			
Number of Dependents <sup>e)</sup>			
None	61.49	70.47	68.93
At least one dependent	38.51	29.53	31.07
N	174	859	1003
<sup>e)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.0203.			
Work Status <sup>f)</sup>			
Working	52.87	58.91	57.89
Not working	47.13	41.09	42.11
N	174	859	1003
<sup>f)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.1419.			
Gross Household Income <sup>g)</sup>			
£0 up to £9,999 a year	22.30	11.76	13.57
£10,000 up to £19,999	31.76	22.69	24.25
£20,000 up to £29,999	15.54	24.23	22.74
≥ £30,000 or more a year	30.41	41.32	39.44
N	148	714	862
<sup>g)</sup> Wilcoxon rank-sum test of the equality of distributions returned a $p$ -value of 0.0001.			

4. I see myself as critical, quarrelsome (7 point scale: 1=agree strongly 7=disagree strongly)
5. I see myself as dependable, self-disciplined (7 point scale: 1=agree strongly 7=disagree strongly)
6. I see myself as disorganised, careless (7 point scale: 1=agree strongly 7=disagree strongly)
7. I see myself as calm, emotionally stable (7 point scale: 1=agree strongly 7=disagree strongly)
8. I see myself as anxious, easily upset (7 point scale: 1=agree strongly 7=disagree strongly)
9. I see myself as open to new experience, complex (7 point scale: 1=agree strongly 7=disagree strongly)
10. I see myself as conventional, uncreative (7 point scale: 1=agree strongly 7=disagree strongly)

These 10 traits give rise to 5 personality dimensions. Extraversion is the combination of the first two polarized traits, i.e. extraverted and reserved. The negative trait is given a negative sign and the two are averaged to yield extraversion. The remaining 4 dimensions result from a similar averaging of two opposite traits, and yield agreeableness, conscientiousness, emotional stability and openness respectively. Therefore, each personality variable takes values from -6 to 6. The inclusion of these variables aims to reduce idiosyncratic differences between respondents in the interpretation of both violence and vulnerability, and satisfaction questions.

This paper tries to account for neighborhood characteristics. However, because there are only 1000 observations for the whole of the UK, conditioning on the postcode information would not be feasible. As such, we merge this dataset with an objective measure of criminal activity within the local area. The underlying assumption is that neighbourhoods with similar crime rates are similar in all respects related to domestic violence in the household. As suggested in Morrison and Biehl (1999), higher violence crime rates lowers inhibitions against violent conduct, both via a demonstration effect (emulation of violent behaviour) and via erosion of social norms that regulate interpersonal relations. As such, local crime rates will also capture differences in the strength of the being violent norm. This variable measures the number of all reported crime offences per 1000 individuals and was retrieved for all of the 376 Crime and Disorder Reduction Partnerships (CDRP) throughout England and Wales for the first quarter of 2004. It combines police records with the British Crime Survey self-reported questionnaire of individual experiences. The combination allows police records to be updated or checked against individual experiences thereby improving the reliability of the data. This rate includes all types of assault and not just the bodily harm offences and was chosen simply because it would be hard to argue that any of the subcategories of assault do not contribute to overall safety.

The next section presents a brief description of the estimation process and parameter of interest before we turn to the results in section 5.

## 4 Methodology

Using a life satisfaction approach, this paper estimates the variation in income needed to compensate for the presence of domestic violence. As such, and given a general utility function  $U$  that depends negatively on domestic violence  $DV$  and positively on personal income  $y$ , the total individual cost of domestic violence is  $|\Delta y|$ , such that  $U_0(y_0, DV_0) = U_1(y_0 + \Delta y, DV_1)$ .

The basic utility function chosen is:

$$h_i = \alpha_0 + \alpha_1 VDV_i + \alpha_2 \text{income}_i + \alpha_3 VDV * \text{income}_i + \alpha_4 DV * VDV_i + \alpha' X \quad (1)$$

where  $X$  includes a quadratic function in age, marital status, ethnicity, number of dependents, education, employment status, the 5 personality variables, relative income and local crime rates. To analyse the extent to which vulnerability increases with experience of domestic violence, we interact these two variables. Also, and because the value and nature of violence may depend on the income the individual has access to, we interact the violence variable with income.

The parameter of interest is the amount of annual gross personal income the respondent would, on average, be given to compensate for the presence of domestic violence. As such, and given eq. 1, we are interested in  $\frac{\alpha_1 + \alpha_3 \text{income} + \alpha_4 DV}{\alpha_2 + \alpha_3 VDV}$ .

## 5 Results

Table 2 presents the estimation of the utility functions using the three alternative measures of income discussed above. The first three columns present the results using both men and women, the next three present the results for women only and the last three for men only. Column **I** uses the income measure proposed in Layard, Mayraz, and Nickell (2007). Column **II** uses the imputed values but only uses the cell means and would be the closest to Layard, Mayraz, and Nickell (2007), once the whole distribution is known. Column **III** uses the exact imputed values we estimate using the BHPS dataset. All income variables have been divided by 10000.

Due to the relative small sample size, and to try and treat the categorical variables as such, categorical variables have had some categories collapsed for the purpose of estimation. Employment status becomes a binary variable where the relevant factor is the amount of time spent at home, under the assumption that the longer one stays at home, the more vulnerable to domestic violence s/he is. Hence, it takes the value 1 if the person works less than 8 hours (this includes retired, unemployed, students, not-working for another reason and the very short hours PT workers) and 0 otherwise. Marital status was divided into 3 categories: individuals with a partner (married or not), separated (after having had a partner, whether the separation is a divorce or not) and those that never had a partner or the partner no longer exists (widowed individuals). We took the view that isolating separated individuals is important because there is evidence that some of the most serious cases of domestic violence have been inflicted by ex-spouses. The number of dependents collapses to having none or at least one dependent. The

personality questions are still treated as continuous variables, mainly because they take too many values and given its abstract nature, interval data could be too arbitrary.

Table 2: Estimating the Utility Function

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	0.005 (0.195)	0.006 (0.195)	0.061 (0.200)	0.137 (0.238)	0.131 (0.238)	0.190 (0.243)	-0.148 (0.361)	-0.137 (0.364)	-0.084 (0.373)
VDV	-0.273* (0.096)	-0.277* (0.091)	-0.242* (0.093)	-0.059 (0.130)	-0.095 (0.122)	-0.034 (0.127)	-0.547* (0.153)	-0.522* (0.146)	-0.482* (0.147)
DV × VDV	-0.129 (0.089)	-0.128 (0.089)	-0.141 (0.091)	-0.207* (0.112)	-0.200* (0.112)	-0.224* (0.113)	-0.046 (0.155)	-0.056 (0.156)	-0.039 (0.159)
Layard	0.084 (0.070)			0.197* (0.110)			-0.025 (0.100)		
Layard × VDV	0.084* (0.043)			-0.023 (0.060)			0.208* (0.067)		
interval mean		0.009 (0.055)			0.121 (0.088)			-0.106 (0.080)	
interval mean × VDV		0.088* (0.039)			0.000 (0.054)			0.198* (0.063)	
imputed values			0.043 (0.058)			0.182* (0.108)			-0.046 (0.078)
imputed values × VDV			0.070* (0.041)			-0.029 (0.060)			0.156* (0.060)
female	0.224* (0.093)	0.198* (0.092)	0.255* (0.097)						
age	-0.118* (0.022)	-0.118* (0.022)	-0.129* (0.023)	-0.129* (0.031)	-0.128* (0.031)	-0.140* (0.032)	-0.119* (0.034)	-0.118* (0.035)	-0.137* (0.037)
age <sup>2</sup>	0.001* (0.000)	0.001* (0.000)	0.001* (0.000)	0.002* (0.000)	0.002* (0.000)	0.002* (0.000)	0.001* (0.000)	0.001* (0.000)	0.002* (0.000)
separated	-0.264 (0.165)	-0.272* (0.165)	-0.262 (0.169)	-0.442* (0.216)	-0.440* (0.216)	-0.470* (0.221)	-0.261 (0.273)	-0.255 (0.275)	-0.224 (0.281)
no partner	-0.599* (0.119)	-0.605* (0.120)	-0.629* (0.125)	-0.763* (0.164)	-0.754* (0.164)	-0.783* (0.170)	-0.555* (0.190)	-0.558* (0.191)	-0.621* (0.203)
non-White British	-0.132 (0.153)	-0.135 (0.154)	-0.104 (0.157)	-0.103 (0.214)	-0.092 (0.214)	-0.041 (0.217)	-0.149 (0.231)	-0.179 (0.232)	-0.155 (0.240)
at least one child	0.189* (0.067)	0.190* (0.067)	0.175 (0.067)	0.280* (0.067)	0.272* (0.067)	0.255* (0.067)	0.077 (0.067)	0.093 (0.067)	0.062 (0.067)

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.108)	(0.108)	(0.113)	(0.149)	(0.149)	(0.154)	(0.166)	(0.167)	(0.176)
vocational diploma	0.046	0.060	0.051	0.248	0.247	0.229	-0.240	-0.215	-0.227
	(0.160)	(0.161)	(0.171)	(0.229)	(0.230)	(0.247)	(0.232)	(0.233)	(0.246)
CSE A levels	0.007	0.009	0.000	0.150	0.145	0.142	-0.153	-0.139	-0.161
	(0.159)	(0.159)	(0.168)	(0.222)	(0.222)	(0.238)	(0.234)	(0.236)	(0.246)
graduate	0.040	0.060	0.046	0.208	0.213	0.217	-0.170	-0.130	-0.185
	(0.164)	(0.164)	(0.175)	(0.232)	(0.232)	(0.250)	(0.240)	(0.241)	(0.256)
not employed	-0.172	-0.220*	-0.248*	-0.313*	-0.333*	-0.339*	0.027	-0.049	-0.117
	(0.110)	(0.108)	(0.112)	(0.144)	(0.141)	(0.151)	(0.185)	(0.182)	(0.189)
extraversion	0.291*	0.287*	0.282*	0.276*	0.275*	0.263*	0.339*	0.324*	0.314*
	(0.057)	(0.057)	(0.059)	(0.079)	(0.079)	(0.081)	(0.085)	(0.085)	(0.089)
agreeableness	-0.068	-0.069	-0.094*	-0.059	-0.060	-0.095	-0.089	-0.095	-0.106
	(0.049)	(0.049)	(0.052)	(0.069)	(0.069)	(0.073)	(0.070)	(0.071)	(0.075)
conscientiousness	0.053	0.051	0.051	0.113	0.113	0.114	-0.005	-0.004	-0.006
	(0.051)	(0.051)	(0.053)	(0.072)	(0.072)	(0.073)	(0.076)	(0.076)	(0.079)
emotional stability	0.000	0.000	-0.018	-0.051	-0.052	-0.063	0.051	0.063	0.048
	(0.052)	(0.052)	(0.054)	(0.072)	(0.072)	(0.074)	(0.080)	(0.080)	(0.084)
openness	0.016	0.021	0.034	0.082	0.084	0.095	-0.075	-0.066	-0.065
	(0.050)	(0.050)	(0.051)	(0.068)	(0.068)	(0.069)	(0.075)	(0.075)	(0.078)
similar rel. income	-0.161	-0.111	-0.179	-0.221	-0.197	-0.317*	0.229	0.297	0.339
	(0.147)	(0.146)	(0.151)	(0.179)	(0.177)	(0.184)	(0.305)	(0.306)	(0.318)
higher rel. income	-0.214	-0.164	-0.225	-0.077	-0.060	-0.112	0.055	0.114	0.098
	(0.154)	(0.153)	(0.157)	(0.200)	(0.197)	(0.203)	(0.306)	(0.306)	(0.319)
crime	0.004	0.004	0.005	0.003	0.003	0.004	0.005	0.005	0.005
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.006)	(0.003)	(0.004)	(0.004)
Constant	7.125*	7.230*	7.505*	7.213*	7.293*	7.598*	7.390*	7.463*	7.858*
	(0.542)	(0.541)	(0.565)	(0.759)	(0.758)	(0.783)	(0.799)	(0.802)	(0.857)
R <sup>2</sup>	0.179	0.175	0.174	0.172	0.171	0.165	0.186	0.174	0.182
N	767	767	722	419	419	396	348	348	326

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Vulnerability to domestic violence has a major impact both for men and for women, even though for women this is only the case when combined with its past experience. Past experience of violence does not have any impact on utility, once we condition on vulnerability. The income variables per se are only significant for women but overall, the marginal utility of income is positive. For men however, this is due to a positive and significant impact of the  $\text{income} \times \text{VDV}$  variable on utility. This means that an additional unit of income yields more utility to men who feel vulnerable to violence, whereas for women the impact is independent of vulnerability.

The analysis was run for different quantiles of either the household or the personal income distribution. Overall, and due to very small sample sizes, significance of coefficients decreased, even if some magnitudes became notoriously larger. Tables 6, 7, 8 and 9 show the result for different brackets of the household gross income distribution and tables 10, 11, 12 and 13 present the results for different quartiles of the gross personal income, as measured by the OLS imputed values explained above.

Table 3 shows the point estimates derived for both men and women, for different levels of violence and personal income. It shows how men value violence more highly and how their valuation decreases with the level of violence and with income. For women, the valuation does not depend on income nor level of violence because the interaction terms were not significant. As such, it remains at £12308 whereas average male valuation goes from £975 for the richest and more vulnerable group, up to £24724 for the poorest and least vulnerable group.

Table 3: Point estimates of the individual total economic value of violence by vulnerability and personal gross income quartiles

	All			Women			Men		
	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile
Vulnerability*									
Not vulnerable	2.84	1.97	1.05	1.23	1.23	1.23	2.47	1.60	0.68
2	1.42	0.98	0.52	1.23	1.23	1.23	1.24	0.80	0.34
3	0.95	0.66	0.35	1.23	1.23	1.23	0.82	0.53	0.23
4	0.71	0.49	0.26	1.23	1.23	1.23	0.62	0.40	0.17
5	0.57	0.39	0.21	1.23	1.23	1.23	0.49	0.32	0.14
6	0.47	0.33	0.17	1.23	1.23	1.23	0.41	0.27	0.11
Very vulnerable	0.41	0.28	0.15	1.23	1.23	1.23	0.35	0.23	0.10

\* The middle categories are not specified in the questionnaire

A few more comments on the remaining regressors are warranted. Being a woman has a positive impact on utility, which is in line with previous studies (e.g. Frey and Stutzer (2002)). This finding has been interpreted as cultural or in terms of women being more similar to their reference group than men. Whichever the reasons, this finding can, in the context of this paper, also be interpreted as women’s higher tolerance for violence or even, society’s higher tolerance for violence against women than against men. We estimated a U-shape age profile of utility for all groups, which is in line with the literature. However, and as pointed out in Santos (2007), accounting for cohort effects can matter greatly in estimating the true profile. Unfortunately, with a cross-section only, this is not possible here. Marital status variables show that being separated is only significantly worse for women, and not having a partner at all, which is most likely driven by widowhood, is the worst state, as previous studies have found (Ferrer-i-Carbonell and Frijters (2004)). Having dependents has a positive impact on utility, conditional on violence and socio-demographic status. However, being at home considerably worsens women’s utility. Neither bargaining power nor crime rates impact on utility.

## 6 Refining the income imputed values - the impact of violence on income

The estimation results from the previous section hinge on an income variable that was created from an imputation exercise using the BHPS. However, the BHPS does not contain any information on victimization status. The correlation between income and violence has been shown in several reports and studies, however, the nature of this relationship is still not well-established. Angelucci (2007) characterizes the impact of violence on income. Other studies (e.g. Anand and Santos (2007)) show that the most vulnerable groups to violence tend to be the lower income groups. Similarly, the Krug, Dahlberg, Mercy, Zwi, and Lozano’s (2002) report on violence also shows that countries with higher crime rates, inside and outside the home, tend to be lower income countries too. This implies that the values imputed to respondents who have been victims of domestic violence may well be overestimated and this makes it important to assess the degree to which violence diminishes income. Aizer (2007) uses the fact that some industries are more populated with women and others with men and explores wage differentials to instrument for wages. However, the gender composition of industries and wage differentials may themselves reflect changes in circumstances that make violence less likely. As such, the assumption that these wage differential changes are solely due to economic pressures may be too stringent.

This paper attempts to find the degree to which income is further diminished by violence using an instrument for violence. The dataset has information on whether individuals have sufficient opportunities to satisfy their sexual needs and desires. The exact question is “Do you have sufficient opportunities to satisfy your sexual needs and desires? (0 = Yes 1 = No)”. The proportion of respondents dissatisfied with their sexual life is 0.166 among non-victims and 0.222 among victims of domestic violence. This difference is statistically significant at the 5% significance level. The identification assumption is that, conditional on being a victim of

domestic violence, satisfaction with one’s sexual life does not have an impact on income. One can argue that those individuals who are working long hours and devoting too much time to their professional lives may be earning higher income, undermining this identification strategy. To circumvent this issue, the analysis is conditioned on the degree to which the individual feels under strain. The exact wording is: “Have you recently felt constantly under strain? (1 = Not at all up to 4 = Much more than usual)”. For the sake of the analysis, we collapse the 4 categories into “more or much more than usual” and “not more than usual and not at all”. Because the income values have been imputed, we conduct a two-stage LAD estimator, according to Amemiya (1982). Standard errors are bootstrapped in order to take into account the fact that the regressor related to violence, in the second stage, is already an estimate. As such, the results should be less sensitive to the actual values imputed. Once the impact of violence on income is estimated, the estimates are deducted to the imputed values of income using linear interpolation between quantiles. With the new income values for victims of domestic violence, the estimation from section ?? is repeated.

## 6.1 Impact of violence on income - 2SLAD results

This section presents the results from a two-stage LAD, correcting the standard errors via bootstrapping. If one does not want to make distributional assumptions on the error terms, the asymptotic variance-covariance matrix is not known (Amemiya (1982)). For this reason, and despite the remark in Horowitz (2001) about the lack of reliability of the bootstrapping method of standard errors under weak instruments - which seems to be the case here, table 4 shows the results of this exercise using the whole sample and simultaneously estimating the coefficients at the 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and the 90<sup>th</sup> percentiles.

Table 4: Estimating impact of violence on income: 2-stage LAD

	1 <sup>st</sup> decile	1 <sup>st</sup> quartile	median	3 <sup>rd</sup> quartile	9 <sup>th</sup> decile
predicted violence	0.197 (0.486)	-0.017 (0.387)	-0.716 (0.449)	-2.331 * (0.670)	-3.908 * (1.322)
under strain	-0.040 (0.111)	0.001 (0.091)	0.147 (0.101)	0.440* (0.133)	0.814* (0.297)
female	-0.351 * (0.127)	-0.207 * (0.121)	-0.433 * (0.132)	-0.024 (0.179)	-0.173 (0.388)
age	0.002 (0.024)	0.007 (0.021)	0.002 (0.018)	-0.075 * (0.036)	-0.097 (0.065)
age <sup>2</sup>	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001* (0.000)	0.001 (0.001)
separated	-0.127 (0.238)	-0.068 (0.199)	0.098 (0.239)	0.668* (0.351)	1.019 (0.897)
no partner	-0.038 (0.113)	-0.022 (0.116)	-0.210 * (0.099)	-0.110 (0.161)	-0.382 (0.328)
non-White British	-0.141 (0.186)	0.024 (0.138)	0.069 (0.124)	0.001 (0.202)	-0.140 (0.592)

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Table 4 – continued from previous page

	1 <sup>st</sup> decile	1 <sup>st</sup> quartile	median	3 <sup>rd</sup> quartile	9 <sup>th</sup> decile
at least one child	0.008 (0.113)	0.048 (0.076)	0.000 (0.097)	0.407* (0.158)	0.575 (0.354)
vocational diploma	0.294* (0.125)	0.241* (0.099)	0.201 (0.133)	0.224 (0.153)	0.443 (0.336)
CSE A levels	-0.003 (0.145)	0.087 (0.094)	0.017 (0.113)	-0.185 (0.165)	-0.032 (0.347)
graduate	0.164 (0.156)	0.309* (0.142)	0.428* (0.153)	0.320 (0.205)	0.398 (0.481)
not employed	-0.651 * (0.088)	-0.902 * (0.073)	-1.009 * (0.074)	-1.233 * (0.109)	-1.293 * (0.268)
extraversion	0.019 (0.053)	-0.036 (0.042)	-0.039 (0.037)	-0.038 (0.056)	-0.057 (0.109)
agreeableness	-0.097 (0.059)	-0.010 (0.050)	0.095 (0.067)	0.253* (0.083)	0.385* (0.159)
conscientiousness	0.016 (0.053)	-0.006 (0.048)	-0.110 * (0.055)	-0.218 * (0.077)	-0.213 (0.162)
emotional stability	0.002 (0.057)	-0.002 (0.039)	-0.091 * (0.055)	-0.216 * (0.066)	-0.106 (0.130)
openness	-0.022 (0.044)	0.032 (0.041)	0.113* (0.049)	0.225* (0.085)	0.303* (0.152)
similar rel. income	0.297* (0.098)	0.566* (0.103)	0.557* (0.101)	0.883* (0.125)	0.984* (0.288)
higher rel. income	0.491* (0.105)	0.613* (0.103)	0.780* (0.111)	1.191* (0.156)	2.032* (0.416)
crime	0.000 (0.003)	0.000 (0.002)	0.000 (0.002)	0.002 (0.004)	0.011 (0.009)
Constant	0.517 (0.927)	0.645 (0.746)	2.155* (0.748)	5.491* (1.331)	7.714* (2.625)
Pseudo R <sup>2</sup>	0.221	0.278	0.270	0.240	0.237
N	650	650	650	650	650

Significance levels : \* : 10%

Standard errors in parentheses. 200 replications.

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Results show that not only the impact, but also the significance of the impact of violence on income increases with income. As such, at the median, violence is marginally significant with a moderate impact on income (on average of £7165) and this increases substantially in the 4<sup>th</sup> quartile and even more so in the 10<sup>th</sup> decile. We will use the smallest value in the 95% confidence interval to correct the imputed income distribution for those who are subject to violence, via linear interpolation. To avoid loss of observations, we will assume that for all income larger than the 10<sup>th</sup> decile, the correction remains unchanged. For values lower than the median, we will assume no correction. We will use previous exposure to domestic violence as our violence variable to avoid arbitrary decisions in terms of cutoffs of the vulnerability question. Table 5 shows the average total economic value for men and women, at different levels of personal income and vulnerability. Low significance rendered the estimates for the pooled sample undefined. Otherwise, these estimates do replicate the previous ones in the

percentiles of the income distribution where the corrections were not made or were relatively small. For higher income respondents however, their overall valuation increases, particularly for lower levels of vulnerability.

Table 5: Point estimates of the individual total economic value of violence by vulnerability and personal gross income quartiles

	All			Women			Men		
	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile	1 <sup>st</sup> income quartile	2 <sup>nd</sup> income quartile	3 <sup>rd</sup> income quartile
Vulnerability*									
Not vulnerable	und	und	und	1.26	1.26	1.26	2.45	1.67	1.59
2	und	und	und	1.26	1.26	1.26	1.23	0.83	0.79
3	und	und	und	1.26	1.26	1.26	0.82	0.56	0.53
4	und	und	und	1.26	1.26	1.26	0.61	0.42	0.40
5	und	und	und	1.26	1.26	1.26	0.49	0.33	0.32
6	und	und	und	1.26	1.26	1.26	0.41	0.28	0.26
Very vulnerable	und	und	und	1.26	1.26	1.26	0.35	0.24	0.23

\* The middle categories are not specified in the questionnaire

## 7 Conclusion

This paper estimates the total economic value respondents place on domestic violence using a life satisfaction approach. It draws on a survey that includes data on self-reported victimization and vulnerability variables, individual income and a self-reported general satisfaction variable. Using a linear earnings equation, it estimates the shadow price between violence and income, conditioning on socio-demographic characteristics, local crime rates, personality and bargaining power. The individual income data is only available in intervals. To overcome this discontinuity problem, income values were matched with individuals from the BHPS, based on a rich set of variables. However, because the BHPS does not include data on victimization, we have estimated the impact of violence on the income distribution using a 2-stage LAD estimator and corrected the imputed values accordingly. All in all, the valuation respondents place on violence depends both on income and on whether they are men and women. Men's valuation tends to be more significant for low income levels and for low vulnerability levels. Women's valuation and marginal utility of income does not seem to depend significantly on violence.

This procedure seems robust even though there are a few limitations with this dataset. First of all, knowing when the respondents had been a victim and whether they were still in a violent relationship would probably have made a difference; particularly for the higher income individuals who are more capable of leaving a violent relationship. Secondly, the sample size does not allow for more flexible specifications and estimation procedures. Also, knowing whether the victims grew in a violent household would also contribute to characterize their overall attitude towards violence, over and above the personality variables. Nevertheless, this paper still provides a measure of the value of violence which again points to the fact that this issue has hidden consequences for the victim that are seldom taken into account in well-being studies. This paper hopes to have partly filled this gap.

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Table 6: Estimating the Utility Function: household income  
 $\leq \pounds 10000$

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	-0.838 (0.556)	-0.838 (0.556)	-0.487 (0.568)	-0.947 (0.828)	-0.947 (0.828)	-0.256 (0.979)	0.732 (2.240)	0.732 (2.240)	4.070 (2.100)
VDV	-0.804* (0.255)	-0.804* (0.255)	-0.786* (0.230)	-1.623 (1.819)	-1.623 (1.819)	-1.165 (0.864)	-1.253* (0.639)	-1.253* (0.639)	-1.555* (0.367)
DV $\times$ VDV	0.207 (0.317)	0.207 (0.317)	0.131 (0.313)	0.598 (0.561)	0.598 (0.561)	0.310 (0.679)	-0.516 (0.867)	-0.516 (0.867)	-1.101 (0.798)
Layard	-2.711* (1.354)			-4.260 (4.011)			-3.588 (5.978)		
Layard $\times$ VDV	0.655 (0.571)			1.285 (2.851)			1.883 (1.103)		
interval mean		-3.278* (1.637)			-5.151 (4.850)			-4.339 (7.228)	
interval mean $\times$ VDV		0.792 (0.691)			1.554 (3.447)			2.276 (1.333)	
imputed values			-3.812* (1.375)			-4.450 (2.740)			-4.777 (3.585)
imputed values $\times$ VDV			0.888 (0.592)			1.178 (1.721)			2.810* (0.741)
female	0.348 (0.330)	0.348 (0.330)	0.178 (0.366)						
age	-0.106 (0.067)	-0.106 (0.067)	-0.136* (0.070)	-0.122 (0.093)	-0.122 (0.093)	-0.161 (0.103)	-0.151 (0.272)	-0.151 (0.272)	-0.322 (0.227)
age <sup>2</sup>	0.001* (0.001)	0.001* (0.001)	0.002* (0.001)	0.001 (0.001)	0.001 (0.001)	0.002 (0.001)	0.001 (0.003)	0.001 (0.003)	0.003 (0.002)
separated	0.014 (0.386)	0.014 (0.386)	0.157 (0.395)	0.116 (0.489)	0.116 (0.489)	0.130 (0.531)	-0.560 (1.488)	-0.560 (1.488)	-1.691 (0.941)
no partner	-0.114 (0.340)	-0.114 (0.340)	0.044 (0.369)	0.080 (0.464)	0.080 (0.464)	0.094 (0.527)	-1.734 (1.534)	-1.734 (1.534)	-3.441 (2.007)
non-White British	0.093	0.093	0.200	-0.574	-0.574	-0.724	1.015	1.015	0.454

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.486)	(0.486)	(0.509)	(0.716)	(0.716)	(0.791)	(2.083)	(2.083)	(1.243)
at least one child	0.191	0.191	0.587	0.010	0.010	0.463	-1.627	-1.627	-1.427
	(0.418)	(0.418)	(0.449)	(0.566)	(0.566)	(0.657)	(2.093)	(2.093)	(1.959)
vocational diploma	-0.427	-0.427	-0.186	-0.233	-0.233	0.363	-0.451	-0.451	-2.869*
	(0.455)	(0.455)	(0.491)	(0.636)	(0.636)	(0.713)	(1.216)	(1.216)	(1.050)
CSE A levels	-0.005	-0.005	0.251	0.318	0.318	0.518	-0.414	-0.414	-0.429
	(0.419)	(0.419)	(0.420)	(0.559)	(0.559)	(0.624)	(1.296)	(1.296)	(0.824)
graduate	-0.190	-0.190	0.161	0.174	0.174	0.520	-1.462	-1.462	-2.385*
	(0.443)	(0.443)	(0.458)	(0.599)	(0.599)	(0.683)	(1.247)	(1.247)	(0.775)
not employed	-0.141	-0.141	-0.700	-0.202	-0.202	-0.799	1.751	1.751	-0.142
	(0.411)	(0.411)	(0.450)	(0.506)	(0.506)	(0.584)	(1.777)	(1.777)	(1.650)
extraversion	0.057	0.057	0.055	-0.060	-0.060	0.023	0.454	0.454	0.767
	(0.207)	(0.207)	(0.210)	(0.276)	(0.276)	(0.294)	(0.911)	(0.911)	(0.623)
agreeableness	0.218	0.218	0.044	0.272	0.272	0.066	0.435	0.435	-1.170*
	(0.200)	(0.200)	(0.216)	(0.256)	(0.256)	(0.279)	(0.642)	(0.642)	(0.553)
conscientiousness	0.022	0.022	-0.008	0.086	0.086	0.146	-0.014	-0.014	-0.453
	(0.172)	(0.172)	(0.171)	(0.224)	(0.224)	(0.238)	(0.484)	(0.484)	(0.343)
emotional stability	0.086	0.086	-0.007	-0.246	-0.246	-0.260	0.450	0.450	0.467
	(0.174)	(0.174)	(0.181)	(0.260)	(0.260)	(0.280)	(0.714)	(0.714)	(0.757)
openness	0.037	0.037	0.017	-0.002	-0.002	-0.050	0.458	0.458	0.240
	(0.176)	(0.176)	(0.173)	(0.220)	(0.220)	(0.229)	(1.077)	(1.077)	(1.012)
similar rel. income	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)
higher rel. income	-0.521	-0.521	-0.588	-4.899	-4.899	-4.329	0.740	0.740	1.141
	(1.297)	(1.297)	(1.205)	(5.158)	(5.158)	(3.141)	(4.378)	(4.378)	(2.432)
crime	0.002	0.002	0.008	0.011	0.011	0.019	0.007	0.007	-0.016
	(0.014)	(0.014)	(0.013)	(0.020)	(0.020)	(0.021)	(0.053)	(0.053)	(0.038)
Constant	9.143*	9.143*	9.472*	15.469*	15.469*	14.252*	9.012	9.012	17.854*
	(2.220)	(2.220)	(2.273)	(7.963)	(7.963)	(5.048)	(6.618)	(6.618)	(5.760)
R <sup>2</sup>	0.082	0.082	0.143	-0.079	-0.079	-0.084	-0.063	-0.063	0.587
N	99	99	91	68	68	62	31	31	29

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 7: Estimating the Utility Function: household income  
 $\in [\pounds 10000, \pounds 20000[$

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	0.155 (0.477)	0.155 (0.477)	0.269 (0.502)	-0.115 (0.564)	-0.115 (0.564)	-0.024 (0.603)	1.290 (1.244)	1.290 (1.244)	1.248 (1.341)
VDV	0.142 (0.388)	0.142 (0.341)	0.349 (0.348)	0.180 (0.497)	0.173 (0.435)	0.259 (0.435)	-0.348 (0.878)	-0.275 (0.772)	0.143 (0.865)
DV $\times$ VDV	-0.303 (0.225)	-0.303 (0.225)	-0.294 (0.236)	-0.178 (0.287)	-0.178 (0.287)	-0.183 (0.305)	-0.727 (0.480)	-0.727 (0.480)	-0.690 (0.499)
Layard	0.360 (0.567)			0.103 (0.776)			-0.017 (1.196)		
Layard $\times$ VDV	0.000 (0.295)			-0.040 (0.388)			0.405 (0.639)		
interval mean		0.361 (0.550)			0.099 (0.755)			0.031 (1.150)	
interval mean $\times$ VDV		0.000 (0.261)			-0.035 (0.343)			0.358 (0.565)	
imputed values			-0.580 (1.476)			0.039 (1.989)			-3.009 (2.892)
imputed values $\times$ VDV			-0.166 (0.274)			-0.104 (0.363)			0.054 (0.629)
female	0.468* (0.243)	0.468* (0.243)	0.406 (0.280)						
age	-0.110* (0.055)	-0.110* (0.055)	-0.111* (0.062)	-0.139* (0.078)	-0.139* (0.078)	-0.142 (0.091)	-0.078 (0.102)	-0.078 (0.102)	-0.076 (0.113)
age <sup>2</sup>	0.001* (0.001)	0.001* (0.001)	0.001* (0.001)	0.002* (0.001)	0.002* (0.001)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
separated	0.141 (0.417)	0.141 (0.417)	0.165 (0.438)	-0.400 (0.630)	-0.400 (0.630)	-0.431 (0.655)	1.014 (0.708)	1.014 (0.708)	1.148 (0.765)

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
no partner	-0.912*	-0.912*	-0.976*	-0.891*	-0.891*	-0.845*	-1.145*	-1.145*	-1.206*
	(0.316)	(0.316)	(0.333)	(0.450)	(0.450)	(0.486)	(0.603)	(0.603)	(0.658)
non-White British	-0.238	-0.238	-0.058	-0.247	-0.247	0.250	-0.069	-0.069	0.179
	(0.508)	(0.508)	(0.576)	(0.746)	(0.746)	(0.879)	(0.944)	(0.944)	(1.051)
at least one child	0.277	0.277	0.270	0.215	0.215	0.142	0.460	0.460	0.584
	(0.301)	(0.301)	(0.319)	(0.410)	(0.410)	(0.440)	(0.590)	(0.590)	(0.613)
vocational diploma	-0.469	-0.469	-0.534	-0.230	-0.230	-0.244	-0.467	-0.467	-0.304
	(0.371)	(0.371)	(0.403)	(0.633)	(0.633)	(0.747)	(0.578)	(0.578)	(0.620)
CSE A levels	-0.223	-0.223	-0.316	-0.063	-0.063	-0.057	-0.123	-0.123	-0.249
	(0.355)	(0.355)	(0.380)	(0.545)	(0.545)	(0.638)	(0.615)	(0.615)	(0.639)
graduate	-0.224	-0.224	-0.277	-0.356	-0.356	-0.473	0.271	0.271	0.447
	(0.396)	(0.396)	(0.431)	(0.619)	(0.619)	(0.716)	(0.704)	(0.704)	(0.762)
not employed	0.181	0.181	0.217	0.138	0.138	0.220	0.224	0.224	0.108
	(0.270)	(0.270)	(0.312)	(0.367)	(0.367)	(0.450)	(0.505)	(0.505)	(0.557)
extraversion	0.486*	0.486*	0.505*	0.463*	0.463*	0.435*	0.423*	0.423*	0.486*
	(0.148)	(0.148)	(0.153)	(0.231)	(0.231)	(0.241)	(0.236)	(0.236)	(0.246)
agreeableness	-0.210*	-0.210*	-0.250*	-0.121	-0.121	-0.135	-0.287	-0.287	-0.346
	(0.124)	(0.124)	(0.133)	(0.175)	(0.175)	(0.190)	(0.230)	(0.230)	(0.250)
conscientiousness	0.297*	0.297*	0.302*	0.418*	0.418*	0.433*	0.130	0.130	0.163
	(0.132)	(0.132)	(0.140)	(0.193)	(0.193)	(0.212)	(0.242)	(0.242)	(0.254)
emotional stability	0.163	0.163	0.130	0.162	0.162	0.115	0.101	0.101	0.036
	(0.143)	(0.143)	(0.152)	(0.204)	(0.204)	(0.222)	(0.255)	(0.255)	(0.274)
openness	0.038	0.038	0.086	0.153	0.153	0.205	-0.265	-0.265	-0.192
	(0.132)	(0.132)	(0.139)	(0.178)	(0.178)	(0.191)	(0.242)	(0.242)	(0.255)
similar rel. income	-0.048	-0.007	0.479	-0.320	-0.313	-0.362	0.083	0.127	1.825
	(0.435)	(0.475)	(1.016)	(0.572)	(0.625)	(1.377)	(0.875)	(0.954)	(2.026)
higher rel. income	(dropped)	(dropped)	1.661	(dropped)	(dropped)	0.162	(dropped)	(dropped)	4.694
			(1.972)			(2.705)			(3.773)
crime	-0.012	-0.012	-0.009	-0.011	-0.011	-0.006	-0.010	-0.010	-0.017
	(0.011)	(0.011)	(0.012)	(0.016)	(0.016)	(0.017)	(0.025)	(0.025)	(0.026)
Constant	6.369*	6.369*	6.245*	7.685*	7.692*	7.648*	6.271*	6.199*	6.180*
	(1.496)	(1.488)	(1.578)	(2.320)	(2.317)	(2.572)	(2.609)	(2.572)	(2.752)
R <sup>2</sup>	0.189	0.189	0.180	0.064	0.064	0.029	0.180	0.180	0.176

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
N	170	170	159	100	100	92	70	70	67

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 8: Estimating the Utility Function: household income  
 $\in [\pounds 20000, \pounds 30000[$

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	0.854*	0.846*	0.914*	0.541	0.522	0.541	1.554	1.554	1.624
	(0.475)	(0.475)	(0.478)	(0.658)	(0.658)	(0.656)	(1.815)	(1.815)	(1.856)
VDV	0.368	0.379	0.463	0.305	0.324	0.451	-0.266	-0.239	-0.251
	(0.286)	(0.285)	(0.300)	(0.341)	(0.338)	(0.354)	(1.434)	(1.356)	(1.440)
DV $\times$ VDV	-0.587*	-0.585*	-0.609*	-0.443*	-0.440*	-0.481*	-1.211	-1.211	-1.306
	(0.206)	(0.205)	(0.208)	(0.239)	(0.238)	(0.239)	(1.465)	(1.465)	(1.500)
Layard	0.401			0.584			-0.944		
	(0.381)			(0.499)			(1.282)		
Layard $\times$ VDV	-0.181			-0.217			0.210		
	(0.135)			(0.163)			(0.654)		
interval mean		0.396			0.571			-0.854	
		(0.349)			(0.453)			(1.184)	
interval mean $\times$ VDV		-0.191			-0.234			0.205	
		(0.138)			(0.166)			(0.639)	
imputed values			0.458			0.681			-0.730
			(0.376)			(0.494)			(1.220)
imputed values $\times$ VDV			-0.234			-0.294			0.237
			(0.148)			(0.176)			(0.682)
female	0.008	0.010	0.020						
	(0.209)	(0.209)	(0.220)						

Continued on next page

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
age	-0.171*	-0.171*	-0.184*	-0.283*	-0.282*	-0.289*	-0.043	-0.043	-0.080
	(0.059)	(0.059)	(0.062)	(0.098)	(0.098)	(0.096)	(0.087)	(0.087)	(0.101)
age <sup>2</sup>	0.002*	0.002*	0.002*	0.003*	0.003*	0.003*	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
separated	-0.826*	-0.826*	-0.760*	0.200	0.193	0.209	-1.589*	-1.589*	-1.383*
	(0.383)	(0.383)	(0.388)	(0.654)	(0.652)	(0.655)	(0.553)	(0.553)	(0.565)
no partner	-0.572*	-0.574*	-0.475	-0.660	-0.665	-0.671	-0.531	-0.531	-0.277
	(0.299)	(0.299)	(0.315)	(0.439)	(0.438)	(0.448)	(0.481)	(0.481)	(0.546)
non-White British	-0.035	-0.034	0.003	-0.129	-0.130	-0.100	0.774	0.774	0.944
	(0.330)	(0.330)	(0.330)	(0.456)	(0.456)	(0.455)	(0.664)	(0.664)	(0.686)
at least one child	0.421*	0.419*	0.481*	0.690*	0.688*	0.753*	0.076	0.076	0.230
	(0.247)	(0.247)	(0.255)	(0.353)	(0.353)	(0.360)	(0.420)	(0.420)	(0.438)
vocational diploma	0.342	0.342	0.409	0.728	0.734	0.760	0.219	0.219	0.410
	(0.353)	(0.353)	(0.379)	(0.535)	(0.534)	(0.560)	(0.539)	(0.539)	(0.626)
CSE A levels	0.261	0.259	0.332	0.543	0.548	0.673	0.268	0.268	0.381
	(0.351)	(0.351)	(0.373)	(0.538)	(0.537)	(0.558)	(0.563)	(0.563)	(0.640)
graduate	0.101	0.101	0.107	0.195	0.201	0.340	0.288	0.288	0.132
	(0.380)	(0.380)	(0.406)	(0.565)	(0.565)	(0.587)	(0.603)	(0.603)	(0.712)
not employed	-0.175	-0.174	-0.172	-0.393	-0.392	-0.317	0.188	0.188	0.119
	(0.241)	(0.241)	(0.257)	(0.319)	(0.318)	(0.329)	(0.508)	(0.508)	(0.572)
extraversion	0.254*	0.254*	0.227*	0.319*	0.320*	0.337*	0.112	0.112	0.016
	(0.130)	(0.129)	(0.134)	(0.186)	(0.186)	(0.189)	(0.210)	(0.210)	(0.222)
agreeableness	-0.029	-0.029	-0.034	0.010	0.008	0.024	-0.108	-0.108	-0.180
	(0.102)	(0.102)	(0.108)	(0.160)	(0.160)	(0.166)	(0.153)	(0.153)	(0.177)
conscientiousness	-0.046	-0.045	-0.055	-0.062	-0.057	-0.095	-0.072	-0.072	-0.061
	(0.117)	(0.117)	(0.120)	(0.179)	(0.179)	(0.183)	(0.177)	(0.177)	(0.186)
emotional stability	-0.033	-0.033	-0.037	-0.110	-0.110	-0.095	0.231	0.231	0.241
	(0.111)	(0.111)	(0.113)	(0.148)	(0.147)	(0.148)	(0.203)	(0.203)	(0.210)
openness	0.063	0.063	0.061	0.075	0.076	0.079	-0.069	-0.069	-0.111
	(0.101)	(0.101)	(0.106)	(0.184)	(0.183)	(0.186)	(0.134)	(0.134)	(0.154)
similar rel. income	0.106	0.141	0.134	0.015	0.081	0.094	1.952	1.820	1.631
	(0.582)	(0.548)	(0.556)	(0.708)	(0.663)	(0.667)	(1.856)	(1.769)	(1.786)
higher rel. income	0.342	0.407	0.348	0.118	0.242	0.260	3.069	2.808	2.264

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
crime	(0.913)	(0.816)	(0.827)	(1.229)	(1.095)	(1.107)	(2.473)	(2.242)	(2.228)
	0.012	0.012	0.015	0.011	0.011	0.013	0.012	0.012	0.019
	(0.009)	(0.009)	(0.010)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)
Constant	6.603*	6.579*	6.490*	8.618*	8.572*	8.167*	4.204	4.177	4.633
	(1.578)	(1.578)	(1.668)	(2.390)	(2.389)	(2.384)	(3.102)	(3.064)	(3.371)
R <sup>2</sup>	0.139	0.140	0.142	0.145	0.147	0.165	0.021	0.021	-0.016
N	170	170	161	93	93	90	77	77	71

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 9: Estimating the Utility Function: household income  
 $\geq \pounds 30000$

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	-0.324	-0.304	-0.320	-0.238	-0.250	-0.280	-1.036*	-0.963*	-0.931
	(0.335)	(0.333)	(0.338)	(0.439)	(0.435)	(0.439)	(0.567)	(0.567)	(0.582)
VDV	-0.668*	-0.616*	-0.607*	-0.857*	-0.893*	-0.916*	-1.092*	-0.639	-0.407
	(0.266)	(0.231)	(0.241)	(0.340)	(0.312)	(0.332)	(0.635)	(0.442)	(0.398)
DV $\times$ VDV	0.157	0.147	0.172	0.298	0.317	0.326	0.366	0.301	0.322
	(0.180)	(0.178)	(0.183)	(0.256)	(0.254)	(0.254)	(0.284)	(0.280)	(0.293)
Layard	-0.030			0.048			-0.232		
	(0.110)			(0.153)			(0.242)		
Layard $\times$ VDV	0.143*			0.134			0.313		
	(0.078)			(0.090)			(0.207)		
interval mean		-0.073			-0.055			-0.125	
		(0.079)			(0.110)			(0.155)	
interval mean $\times$ VDV		0.125*			0.147*			0.161	
		(0.062)			(0.074)			(0.137)	

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
imputed values			-0.020 (0.083)			0.009 (0.144)			0.022 (0.134)
imputed values × VDV			0.106 (0.066)			0.160* (0.090)			0.059 (0.110)
female	0.319* (0.132)	0.298* (0.131)	0.323* (0.137)						
age	-0.100* (0.036)	-0.098* (0.036)	-0.103* (0.037)	-0.138* (0.057)	-0.137* (0.057)	-0.141* (0.059)	-0.118* (0.054)	-0.110* (0.054)	-0.130* (0.057)
age <sup>2</sup>	0.001* (0.000)	0.001* (0.000)	0.001* (0.000)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.001* (0.001)	0.001* (0.001)	0.001* (0.001)
separated	-0.135 (0.364)	-0.106 (0.365)	-0.153 (0.369)	-0.159 (0.541)	-0.127 (0.539)	-0.245 (0.543)	-0.236 (0.543)	-0.241 (0.545)	-0.362 (0.558)
no partner	-0.504* (0.190)	-0.498* (0.191)	-0.566* (0.197)	-0.709* (0.285)	-0.684* (0.284)	-0.733* (0.289)	-0.327 (0.285)	-0.322 (0.287)	-0.441 (0.305)
non-White British	-0.342 (0.224)	-0.354 (0.224)	-0.322 (0.226)	-0.081 (0.326)	-0.049 (0.325)	0.036 (0.330)	-0.514 (0.335)	-0.555 (0.337)	-0.497 (0.344)
at least one child	0.030 (0.149)	0.038 (0.149)	-0.023 (0.154)	0.042 (0.234)	0.050 (0.233)	0.010 (0.240)	0.042 (0.213)	0.049 (0.214)	-0.040 (0.225)
vocational diploma	0.352 (0.308)	0.354 (0.308)	0.325 (0.320)	0.436 (0.436)	0.436 (0.434)	0.431 (0.435)	0.351 (0.459)	0.376 (0.461)	0.406 (0.512)
CSE A levels	0.164 (0.314)	0.162 (0.313)	0.107 (0.325)	-0.050 (0.454)	-0.039 (0.449)	-0.051 (0.455)	0.394 (0.464)	0.416 (0.466)	0.394 (0.513)
graduate	0.316 (0.308)	0.325 (0.307)	0.300 (0.322)	0.306 (0.429)	0.315 (0.425)	0.296 (0.431)	0.391 (0.465)	0.431 (0.466)	0.445 (0.520)
not employed	-0.297 (0.187)	-0.316* (0.186)	-0.344* (0.193)	-0.538* (0.250)	-0.578* (0.246)	-0.554* (0.251)	0.001 (0.302)	-0.031 (0.303)	-0.130 (0.329)
extraversion	0.275* (0.082)	0.271* (0.083)	0.281* (0.085)	0.192* (0.113)	0.175 (0.113)	0.188 (0.115)	0.322* (0.124)	0.316* (0.126)	0.306* (0.134)
agreeableness	-0.100 (0.069)	-0.103 (0.069)	-0.089 (0.073)	-0.159 (0.108)	-0.164 (0.107)	-0.152 (0.112)	-0.069 (0.095)	-0.074 (0.096)	-0.055 (0.101)
conscientiousness	-0.066 (0.076)	-0.066 (0.076)	-0.072 (0.077)	-0.107 (0.113)	-0.096 (0.112)	-0.094 (0.113)	-0.058 (0.109)	-0.057 (0.110)	-0.053 (0.114)
emotional stability	-0.105	-0.097	-0.107	-0.063	-0.051	-0.053	-0.093	-0.076	-0.081

Continued on next page

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.078)	(0.078)	(0.081)	(0.117)	(0.117)	(0.118)	(0.112)	(0.113)	(0.120)
openness	-0.013	-0.008	0.015	0.086	0.089	0.088	-0.100	-0.088	-0.049
	(0.073)	(0.073)	(0.075)	(0.102)	(0.101)	(0.104)	(0.110)	(0.111)	(0.116)
similar rel. income	-0.214	-0.119	-0.145	-0.658*	-0.551*	-0.657*	0.437	0.505	0.570
	(0.201)	(0.187)	(0.191)	(0.269)	(0.243)	(0.260)	(0.378)	(0.371)	(0.391)
higher rel. income	-0.273	-0.173	-0.283	-0.739*	-0.612	-0.734*	0.411	0.467	0.393
	(0.260)	(0.239)	(0.239)	(0.414)	(0.375)	(0.382)	(0.428)	(0.413)	(0.434)
crime	0.006*	0.006*	0.005*	-0.001	-0.001	-0.002	0.007*	0.007*	0.006
	(0.003)	(0.003)	(0.003)	(0.008)	(0.008)	(0.008)	(0.004)	(0.004)	(0.004)
Constant	7.315*	7.297*	7.426*	9.061*	9.159*	9.234*	7.535*	6.921*	7.045*
	(0.927)	(0.913)	(0.947)	(1.401)	(1.394)	(1.436)	(1.483)	(1.352)	(1.402)
R <sup>2</sup>	0.167	0.166	0.182	0.210	0.218	0.216	0.128	0.119	0.141
N	287	287	273	132	132	129	155	155	144

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

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Table 10: Estimating the Utility Function: gross personal income's 1<sup>st</sup> quartile

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	-0.146	-0.146	-0.073	-0.127	-0.127	-0.071	0.900	0.900	0.921
	(0.452)	(0.452)	(0.460)	(0.501)	(0.501)	(0.520)	(2.341)	(2.341)	(2.329)
VDV	-0.388*	-0.388*	-0.446*	0.344	0.344	0.052	-1.469*	-1.469*	-1.468*
	(0.208)	(0.208)	(0.189)	(0.317)	(0.317)	(0.266)	(0.669)	(0.669)	(0.660)
DV × VDV	0.034	0.034	0.001	-0.069	-0.069	-0.014	-0.030	-0.030	-0.079
	(0.209)	(0.209)	(0.226)	(0.234)	(0.234)	(0.259)	(0.957)	(0.957)	(0.950)
Layard	-0.599			0.881			-1.627		
	(0.730)			(0.914)			(2.388)		

Continued on next page

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
Layard $\times$ VDV	0.168 (0.366)			-0.739 (0.487)			0.935 (1.337)		
interval mean		-0.724 (0.883)			1.065 (1.105)			-1.968 (2.888)	
interval mean $\times$ VDV		0.203 (0.443)			-0.893 (0.589)			1.130 (1.616)	
imputed values			-1.879* (0.915)			-0.737 (1.126)			-3.211 (3.125)
imputed values $\times$ VDV			0.416 (0.468)			-0.382 (0.613)			1.306 (1.583)
female	0.138 (0.281)	0.138 (0.281)	0.103 (0.278)						
age	-0.173* (0.053)	-0.173* (0.053)	-0.173* (0.052)	-0.179* (0.063)	-0.179* (0.063)	-0.186* (0.061)	-0.217 (0.188)	-0.217 (0.188)	-0.222 (0.187)
age <sup>2</sup>	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
separated	-0.153 (0.424)	-0.153 (0.424)	0.006 (0.426)	-0.119 (0.480)	-0.119 (0.480)	-0.007 (0.487)	-1.216 (1.700)	-1.216 (1.700)	-0.985 (1.703)
no partner	-0.509 (0.359)	-0.509 (0.359)	-0.451 (0.355)	-0.606 (0.405)	-0.606 (0.405)	-0.569 (0.404)	-3.321 (2.356)	-3.321 (2.356)	-3.271 (2.294)
non-White British	-0.191 (0.396)	-0.191 (0.396)	-0.128 (0.395)	-0.043 (0.493)	-0.043 (0.493)	0.119 (0.492)	-0.740 (1.446)	-0.740 (1.446)	-0.585 (1.465)
at least one child	0.418 (0.292)	0.418 (0.292)	0.458 (0.289)	0.450 (0.310)	0.450 (0.310)	0.490 (0.310)	-2.720 (2.385)	-2.720 (2.385)	-2.525 (2.312)
vocational diploma	0.317 (0.430)	0.317 (0.430)	0.334 (0.424)	0.448 (0.457)	0.448 (0.457)	0.432 (0.455)	(dropped)	(dropped)	(dropped)
CSE A levels	0.274 (0.327)	0.274 (0.327)	0.294 (0.323)	0.341 (0.382)	0.341 (0.382)	0.364 (0.380)	-0.093 (1.114)	-0.093 (1.114)	0.048 (1.078)
graduate	0.378 (0.361)	0.378 (0.361)	0.399 (0.356)	0.296 (0.436)	0.296 (0.436)	0.374 (0.433)	-0.356 (1.160)	-0.356 (1.160)	-0.255 (1.136)
not employed	-0.657* (0.310)	-0.657* (0.310)	-0.837* (0.328)	-0.543* (0.324)	-0.543* (0.324)	-0.797* (0.348)	-2.825 (2.313)	-2.825 (2.313)	-2.589 (2.338)
extraversion	0.139	0.139	0.144	0.168	0.168	0.174	0.342	0.342	0.316

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.148)	(0.148)	(0.146)	(0.172)	(0.172)	(0.172)	(0.521)	(0.521)	(0.501)
agreeableness	-0.076	-0.076	-0.087	-0.081	-0.081	-0.093	0.457	0.457	0.407
	(0.139)	(0.139)	(0.137)	(0.147)	(0.147)	(0.146)	(0.993)	(0.993)	(0.961)
conscientiousness	-0.002	-0.002	-0.004	0.113	0.113	0.102	0.067	0.067	0.044
	(0.123)	(0.123)	(0.122)	(0.141)	(0.141)	(0.140)	(0.423)	(0.423)	(0.414)
emotional stability	0.166	0.166	0.164	-0.020	-0.020	-0.026	0.467	0.467	0.531
	(0.137)	(0.137)	(0.134)	(0.165)	(0.165)	(0.165)	(0.820)	(0.820)	(0.797)
openness	0.173	0.173	0.176	0.253*	0.253*	0.232*	0.921	0.921	0.919
	(0.122)	(0.122)	(0.120)	(0.131)	(0.131)	(0.130)	(0.963)	(0.963)	(0.910)
similar rel. income	-0.079	-0.079	0.091	-0.148	-0.148	0.060	0.530	0.530	0.888
	(0.302)	(0.302)	(0.302)	(0.319)	(0.319)	(0.323)	(1.828)	(1.828)	(1.845)
higher rel. income	0.133	0.133	0.195	0.100	0.100	0.174	1.713	1.713	1.915
	(0.302)	(0.302)	(0.288)	(0.345)	(0.345)	(0.333)	(1.457)	(1.457)	(1.435)
crime	0.009	0.009	0.010	0.006	0.006	0.007	0.033	0.033	0.031
	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.028)	(0.028)	(0.027)
Constant	8.346*	8.346*	8.615*	7.461*	7.461*	8.289*	13.991*	13.991*	13.857*
	(1.366)	(1.366)	(1.303)	(1.569)	(1.569)	(1.470)	(5.132)	(5.132)	(5.061)
R <sup>2</sup>	0.085	0.085	0.109	0.036	0.036	0.043	-0.146	-0.146	-0.099
N	174	174	174	138	138	138	36	36	36

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 11: Estimating the Utility Function: gross personal income's 2<sup>nd</sup> quartile

DV	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	0.251	0.251	0.246	0.077	0.077	0.066	0.871	0.871	0.832
	(0.448)	(0.448)	(0.448)	(0.601)	(0.601)	(0.592)	(1.255)	(1.255)	(1.249)

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
VDV	-0.143 (0.365)	-0.104 (0.327)	-0.159 (0.389)	-0.360 (0.517)	-0.304 (0.467)	-0.367 (0.524)	0.022 (0.808)	0.070 (0.705)	0.155 (0.971)
DV × VDV	-0.317 (0.209)	-0.317 (0.209)	-0.316 (0.209)	-0.150 (0.302)	-0.150 (0.302)	-0.158 (0.295)	-0.880* (0.495)	-0.880* (0.495)	-0.831* (0.487)
Layard	0.297 (0.457)			0.358 (0.653)			0.651 (0.902)		
Layard × VDV	0.219 (0.243)			0.313 (0.317)			0.270 (0.614)		
interval mean		0.263 (0.404)			0.317 (0.578)			0.576 (0.797)	
interval mean × VDV		0.193 (0.215)			0.276 (0.280)			0.238 (0.543)	
imputed values			0.383 (0.520)			0.450 (0.736)			0.966 (1.077)
imputed values × VDV			0.234 (0.274)			0.327 (0.342)			0.151 (0.759)
female	0.471* (0.223)	0.471* (0.223)	0.502* (0.220)						
age	-0.123* (0.050)	-0.123* (0.050)	-0.125* (0.050)	-0.072 (0.070)	-0.072 (0.070)	-0.072 (0.070)	-0.211* (0.089)	-0.211* (0.089)	-0.220* (0.089)
age <sup>2</sup>	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.002* (0.001)	0.002* (0.001)	0.002* (0.001)
separated	-0.838* (0.396)	-0.838* (0.396)	-0.854* (0.394)	-0.845* (0.463)	-0.845* (0.463)	-0.876* (0.460)	-1.468 (1.899)	-1.468 (1.899)	-1.532 (1.900)
no partner	-0.626* (0.269)	-0.626* (0.269)	-0.623* (0.268)	-0.592 (0.363)	-0.592 (0.363)	-0.581 (0.363)	-0.709 (0.515)	-0.709 (0.515)	-0.722 (0.516)
non-White British	0.076 (0.319)	0.076 (0.319)	0.074 (0.319)	-0.129 (0.455)	-0.129 (0.455)	-0.111 (0.453)	1.045 (0.642)	1.045 (0.642)	1.041 (0.641)
at least one child	0.605* (0.281)	0.605* (0.281)	0.594* (0.280)	0.453 (0.359)	0.453 (0.359)	0.427 (0.357)	0.907 (0.591)	0.907 (0.591)	0.917 (0.592)
vocational diploma	0.311 (0.365)	0.311 (0.365)	0.286 (0.362)	0.835 (0.593)	0.835 (0.593)	0.818 (0.590)	-0.317 (0.508)	-0.317 (0.508)	-0.362 (0.506)
CSE A levels	0.130	0.130	0.134	0.407	0.407	0.442	-0.300	-0.300	-0.326

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.355)	(0.355)	(0.354)	(0.553)	(0.553)	(0.555)	(0.553)	(0.553)	(0.553)
graduate	0.122	0.122	0.101	0.504	0.504	0.498	-0.354	-0.354	-0.410
	(0.417)	(0.417)	(0.415)	(0.618)	(0.618)	(0.616)	(0.810)	(0.810)	(0.808)
not employed	-0.102	-0.102	-0.066	-0.207	-0.207	-0.176	0.205	0.205	0.307
	(0.256)	(0.256)	(0.256)	(0.356)	(0.356)	(0.355)	(0.497)	(0.497)	(0.503)
extraversion	0.339*	0.339*	0.338*	0.247	0.247	0.250	0.588*	0.588*	0.574*
	(0.125)	(0.125)	(0.125)	(0.169)	(0.169)	(0.169)	(0.227)	(0.227)	(0.228)
agreeableness	-0.152	-0.152	-0.145	-0.063	-0.063	-0.058	-0.160	-0.160	-0.150
	(0.116)	(0.116)	(0.116)	(0.151)	(0.151)	(0.152)	(0.243)	(0.243)	(0.242)
conscientiousness	0.127	0.127	0.129	0.279	0.279	0.285*	-0.315	-0.315	-0.318
	(0.123)	(0.123)	(0.123)	(0.168)	(0.168)	(0.168)	(0.235)	(0.235)	(0.233)
emotional stability	0.094	0.094	0.091	0.022	0.022	0.018	0.400	0.400	0.385
	(0.113)	(0.113)	(0.113)	(0.144)	(0.144)	(0.144)	(0.238)	(0.238)	(0.237)
openness	-0.142	-0.142	-0.146	-0.134	-0.134	-0.139	-0.462*	-0.462*	-0.461*
	(0.115)	(0.115)	(0.115)	(0.158)	(0.158)	(0.158)	(0.209)	(0.209)	(0.209)
similar rel. income	-0.361	-0.361	-0.375	-0.222	-0.222	-0.235	0.305	0.305	0.273
	(0.363)	(0.363)	(0.364)	(0.505)	(0.505)	(0.506)	(0.760)	(0.760)	(0.760)
higher rel. income	-0.426	-0.426	-0.416	-0.273	-0.273	-0.247	-0.098	-0.098	-0.073
	(0.393)	(0.393)	(0.391)	(0.557)	(0.557)	(0.552)	(0.762)	(0.762)	(0.763)
crime	-0.005	-0.005	-0.005	-0.001	-0.001	-0.001	-0.007	-0.007	-0.007
	(0.010)	(0.010)	(0.010)	(0.015)	(0.015)	(0.015)	(0.018)	(0.018)	(0.018)
Constant	6.370*	6.423*	6.318*	5.229*	5.293*	5.158*	7.580*	7.697*	7.480*
	(1.374)	(1.340)	(1.394)	(2.193)	(2.139)	(2.207)	(2.152)	(2.089)	(2.227)
R <sup>2</sup>	0.176	0.176	0.177	0.048	0.048	0.048	0.280	0.280	0.280
N	183	183	183	120	120	120	63	63	63

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 12: Estimating the Utility Function: gross personal income's 3<sup>rd</sup> quartile

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	0.289 (0.399)	0.306 (0.400)	0.279 (0.401)	-0.295 (0.461)	-0.295 (0.461)	-0.212 (0.465)	0.898 (0.836)	0.901 (0.838)	0.912 (0.834)
VDV	-0.663* (0.361)	-0.724* (0.375)	-0.552 (0.459)	-0.282 (0.421)	-0.280 (0.441)	0.066 (0.544)	-0.902 (0.836)	-1.005 (0.856)	-0.786 (1.101)
DV × VDV	-0.187 (0.182)	-0.193 (0.183)	-0.195 (0.185)	-0.113 (0.198)	-0.113 (0.198)	-0.158 (0.204)	-0.126 (0.436)	-0.114 (0.437)	-0.174 (0.437)
Layard	0.061 (0.284)			0.573 (0.458)			-0.071 (0.495)		
Layard × VDV	0.228 (0.164)			-0.019 (0.211)			0.279 (0.331)		
interval mean		-0.103 (0.250)			0.615 (0.492)			-0.233 (0.430)	
interval mean × VDV		0.266 (0.174)			-0.020 (0.226)			0.328 (0.350)	
imputed values			0.416 (0.429)			0.976* (0.584)			0.259 (0.842)
imputed values × VDV			0.177 (0.222)			-0.204 (0.283)			0.248 (0.477)
female	0.004 (0.180)	0.022 (0.180)	0.002 (0.180)						
age	-0.215* (0.054)	-0.219* (0.054)	-0.216* (0.054)	-0.260* (0.075)	-0.260* (0.075)	-0.276* (0.073)	-0.220* (0.089)	-0.226* (0.088)	-0.213* (0.089)
age <sup>2</sup>	0.002* (0.001)	0.003* (0.001)	0.002* (0.001)	0.003* (0.001)	0.003* (0.001)	0.003* (0.001)	0.002* (0.001)	0.003* (0.001)	0.002* (0.001)
separated	0.355 (0.345)	0.309 (0.343)	0.359 (0.344)	0.025 (0.474)	0.025 (0.474)	-0.026 (0.474)	0.482 (0.576)	0.429 (0.567)	0.493 (0.575)
no partner	-0.724* (0.229)	-0.734* (0.229)	-0.729* (0.229)	-1.074* (0.302)	-1.074* (0.302)	-1.110* (0.303)	-0.534 (0.383)	-0.533 (0.384)	-0.554 (0.383)
non-White British	0.079	0.126	0.036	0.045	0.045	-0.011	0.087	0.136	0.045

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
	(0.335)	(0.332)	(0.336)	(0.477)	(0.477)	(0.473)	(0.554)	(0.547)	(0.558)
at least one child	0.069	0.066	0.045	0.009	0.009	0.004	0.034	0.036	-0.016
	(0.222)	(0.223)	(0.221)	(0.317)	(0.317)	(0.315)	(0.360)	(0.361)	(0.356)
vocational diploma	-0.354	-0.388	-0.361	0.133	0.133	0.100	-0.577	-0.608	-0.597
	(0.351)	(0.351)	(0.350)	(0.696)	(0.696)	(0.693)	(0.509)	(0.507)	(0.504)
CSE A levels	-0.551	-0.558	-0.570	-0.113	-0.113	-0.174	-0.753	-0.761	-0.794
	(0.355)	(0.356)	(0.356)	(0.696)	(0.696)	(0.697)	(0.513)	(0.515)	(0.509)
graduate	-0.486	-0.527	-0.515	-0.033	-0.033	-0.112	-0.852	-0.905	-0.866
	(0.366)	(0.365)	(0.363)	(0.723)	(0.723)	(0.715)	(0.560)	(0.551)	(0.549)
not employed	-0.465*	-0.464*	-0.431*	-0.609*	-0.609*	-0.602*	-0.262	-0.254	-0.242
	(0.249)	(0.250)	(0.249)	(0.309)	(0.309)	(0.310)	(0.492)	(0.494)	(0.490)
extraversion	0.282*	0.282*	0.273*	0.263*	0.263*	0.257*	0.158	0.149	0.152
	(0.115)	(0.115)	(0.114)	(0.148)	(0.148)	(0.147)	(0.201)	(0.201)	(0.198)
agreeableness	-0.085	-0.092	-0.083	-0.002	-0.002	0.017	-0.186	-0.202	-0.181
	(0.099)	(0.099)	(0.098)	(0.139)	(0.139)	(0.139)	(0.168)	(0.165)	(0.167)
conscientiousness	0.080	0.077	0.089	0.067	0.067	0.051	0.093	0.092	0.098
	(0.106)	(0.106)	(0.106)	(0.156)	(0.156)	(0.157)	(0.164)	(0.164)	(0.163)
emotional stability	-0.018	-0.011	-0.021	-0.188	-0.188	-0.215	0.106	0.118	0.123
	(0.115)	(0.116)	(0.113)	(0.154)	(0.154)	(0.151)	(0.199)	(0.201)	(0.192)
openness	-0.053	-0.058	-0.037	0.157	0.157	0.165	-0.184	-0.188	-0.161
	(0.099)	(0.099)	(0.099)	(0.147)	(0.147)	(0.147)	(0.153)	(0.153)	(0.154)
similar rel. income	-0.544	-0.523	-0.552	-1.061*	-1.061*	-1.039*	0.180	0.192	0.222
	(0.340)	(0.341)	(0.340)	(0.399)	(0.399)	(0.396)	(0.665)	(0.667)	(0.662)
higher rel. income	-0.708*	-0.633*	-0.740*	-0.808	-0.808	-0.705	-0.149	-0.073	-0.181
	(0.373)	(0.366)	(0.372)	(0.490)	(0.490)	(0.481)	(0.712)	(0.698)	(0.702)
crime	0.007	0.007	0.006	-0.001	-0.001	-0.001	0.008	0.008	0.006
	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.017)	(0.017)	(0.017)
Constant	10.211*	10.582*	9.620*	10.397*	10.339*	10.009*	10.446*	10.866*	9.730*
	(1.378)	(1.337)	(1.506)	(2.078)	(2.097)	(2.142)	(2.419)	(2.309)	(2.843)
R <sup>2</sup>	0.230	0.226	0.231	0.422	0.422	0.427	0.034	0.031	0.037
N	183	183	183	84	84	84	99	99	99

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

Table 13: Estimating the Utility Function: gross personal income's 4<sup>th</sup> quartile

	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
DV	0.097 (0.442)	0.108 (0.442)	0.233 (0.439)	0.744 (0.713)	0.810 (0.699)	0.815 (0.688)	-0.648 (0.704)	-0.377 (0.671)	-0.099 (0.667)
VDV	-0.293 (0.491)	-0.249 (0.309)	-0.134 (0.332)	0.236 (0.634)	-0.093 (0.409)	0.051 (0.542)	-1.193 (1.002)	-0.318 (0.576)	0.051 (0.487)
DV × VDV	-0.125 (0.228)	-0.125 (0.228)	-0.173 (0.225)	-0.223 (0.341)	-0.246 (0.336)	-0.252 (0.331)	0.114 (0.418)	-0.104 (0.374)	-0.250 (0.367)
Layard	0.036 (0.182)			0.240 (0.290)			-0.294 (0.331)		
Layard × VDV	0.072 (0.145)			-0.089 (0.193)			0.364 (0.290)		
interval mean		-0.001 (0.101)			0.062 (0.156)			-0.068 (0.180)	
interval mean × VDV		0.058 (0.084)			0.016 (0.107)			0.108 (0.161)	
imputed values			0.076 (0.109)			0.184 (0.231)			0.097 (0.146)
imputed values × VDV			0.025 (0.091)			-0.027 (0.163)			0.002 (0.123)
female	0.247 (0.170)	0.245 (0.170)	0.278* (0.168)						
age	-0.050 (0.049)	-0.051 (0.048)	-0.055 (0.048)	0.092 (0.134)	0.094 (0.132)	0.102 (0.131)	-0.053 (0.061)	-0.053 (0.061)	-0.065 (0.060)
age <sup>2</sup>	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
separated	-0.428 (0.280)	-0.430 (0.277)	-0.447 (0.272)	-0.494 (0.533)	-0.443 (0.531)	-0.533 (0.509)	-0.559 (0.377)	-0.624* (0.375)	-0.645* (0.368)

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
no partner	-0.500*	-0.488*	-0.511*	-0.989*	-0.895*	-0.966*	-0.301	-0.318	-0.351
	(0.229)	(0.228)	(0.223)	(0.415)	(0.415)	(0.403)	(0.331)	(0.333)	(0.327)
non-White British	-0.145	-0.147	-0.131	0.031	0.061	0.177	-0.453	-0.413	-0.376
	(0.295)	(0.294)	(0.291)	(0.519)	(0.517)	(0.497)	(0.409)	(0.417)	(0.406)
at least one child	-0.082	-0.079	-0.130	0.092	0.114	0.088	-0.063	-0.073	-0.130
	(0.175)	(0.174)	(0.172)	(0.373)	(0.372)	(0.366)	(0.222)	(0.223)	(0.221)
vocational diploma	0.287	0.245	0.223	-0.547	-0.686	-0.643	0.024	-0.008	-0.025
	(0.592)	(0.593)	(0.584)	(1.263)	(1.256)	(1.241)	(0.750)	(0.755)	(0.742)
CSE A levels	0.381	0.340	0.294	-0.563	-0.721	-0.731	0.314	0.289	0.239
	(0.607)	(0.609)	(0.599)	(1.271)	(1.271)	(1.254)	(0.754)	(0.761)	(0.747)
graduate	0.490	0.450	0.346	-0.116	-0.269	-0.251	0.203	0.181	0.053
	(0.591)	(0.593)	(0.586)	(1.263)	(1.256)	(1.240)	(0.741)	(0.748)	(0.736)
not employed	0.271	0.262	0.197	-0.753	-0.753	-0.756	0.410	0.394	0.282
	(0.290)	(0.289)	(0.288)	(0.810)	(0.802)	(0.790)	(0.346)	(0.349)	(0.348)
extraversion	0.243*	0.239*	0.248*	0.432*	0.415*	0.415*	0.221	0.229*	0.246*
	(0.105)	(0.105)	(0.103)	(0.203)	(0.204)	(0.201)	(0.135)	(0.137)	(0.134)
agreeableness	0.015	0.016	0.022	-0.137	-0.139	-0.100	0.020	0.032	0.039
	(0.088)	(0.088)	(0.087)	(0.199)	(0.198)	(0.199)	(0.104)	(0.105)	(0.103)
conscientiousness	-0.101	-0.100	-0.117	-0.113	-0.115	-0.094	-0.108	-0.107	-0.130
	(0.093)	(0.093)	(0.092)	(0.187)	(0.186)	(0.185)	(0.120)	(0.121)	(0.119)
emotional stability	-0.252*	-0.248*	-0.280*	-0.481*	-0.469*	-0.471*	-0.134	-0.140	-0.190
	(0.095)	(0.095)	(0.095)	(0.189)	(0.189)	(0.187)	(0.118)	(0.121)	(0.120)
openness	0.146*	0.149*	0.164*	0.270	0.266	0.276	0.082	0.084	0.110
	(0.087)	(0.087)	(0.086)	(0.171)	(0.169)	(0.165)	(0.114)	(0.115)	(0.114)
similar rel. income	0.146	0.176	0.207	0.059	0.132	0.104	0.141	0.159	0.223
	(0.169)	(0.174)	(0.167)	(0.371)	(0.375)	(0.351)	(0.209)	(0.216)	(0.209)
higher rel. income	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)	(dropped)
crime	0.004	0.004	0.004	-0.005	-0.004	-0.005	0.005	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.011)	(0.011)	(0.011)	(0.004)	(0.004)	(0.003)
Constant	5.635*	5.790*	5.681*	3.879	4.438	3.918	6.840*	6.074*	5.814*
	(1.285)	(1.241)	(1.223)	(3.061)	(3.027)	(3.009)	(1.744)	(1.549)	(1.495)
R <sup>2</sup>	0.097	0.100	0.124	0.055	0.061	0.083	0.097	0.085	0.116

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	All			Women			Men		
	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values	Layard	OLS mean	OLS values
N	182	182	182	54	54	54	128	128	128

Significance levels : \* 10% Standard errors in parentheses

Omitted categories: married, other schooling, low relative income, White British, no dependents and working at least 8hrs/week.

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